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CA FINAL – SCM & PE (New Syllabus)

Amendment Batch 3

(Notes for Private Circulation only)

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-: Compiled by :-

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Gold Medalist in Cost & Management Accounting

About CA Rakesh Agrawal

- He passed his B. Com examination from Ness Wadia College of Commerce, Pune in 1989 with distinction.
- He was the Captain of his college Chess Team.
- He was adjudged as the Best Mountaineer of the College for 1988 – 89 year.
- He received the Gold Medal from University of Pune in the Special subject of Cost & Management Accountancy at B. Com level.
- He passed his M. Com. Exam also from University of Pune (external), with the specialization in Advanced Cost & Management Accounting. Of course, he again cleared this exam with distinction.
- He cleared his ICWA examination in the first attempt in December, 1990 and stood Third in the Pune Chapter of Cost Accountants.
- He started teaching the subject of Costing at Pune Chapter of Cost Accountants in the year 1991, as a visiting faculty.
- He completed his CA Final examination in November 1992 attempt with 32nd Rank in All India Merit.
- He has cleared Information Systems Auditor (ISA) exam of ICAI in the very first attempt.
- He has passed State Eligibility Test (SET) in Commerce in the very first attempt.
- He has also passed the Mutual Fund exam and Derivatives Core Module, conducted by National Stock Exchange.
- He is a Founder of Vidarbha Professional Academy (1996), Nagpur.
- He has launched a free mobile app titled as “Costing Dictionary by CA Rakesh Agrawal”. You may download it from Google Playstore.
- He has an online store www.carakeshagrawal.in. Students can buy video lectures from this website and study anytime anywhere.
- He is a Teacher by Passion and Chartered Accountant by Profession.
- He is well known for Conceptual Coaching and Student Friendly nature. At the same time he maintains classroom discipline.
- He teaches you a subject for your life time. He also tries to co-relate the subject with day to day life.
- He believes that “Education is not merely getting a Degree, but it is gaining Knowledge”.
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Preface to Amendment Batch 3

Dear Student Friends,

First of all, I would like to thank you for your overwhelming response to the subject of Strategic Cost Management & Performance Evaluation. Many students are studying this subject through live classes at Pune or Virtual batches at our authorized centers or through video lectures.

There is always a question about how to update ourselves in future, after the batch gets over. Because, there is always a gap between completing a batch and appearing for the exam. In between this period, ICAI might have conducted some more exams, might have released RTPs, Mock Test Papers, Case Studies, New Module etc.

To cover these extra questions or changes at one place, the idea of Amendment Batch clicked to my mind. It is just an effort to keep you people updated. The new syllabus was introduced w.e.f. 1st July, 2017 and since that date, this is my third amendment batch. These amendment batches cover almost all changes which ICAI has introduced, up to 30th April, 2020. I have tried to identify the repeat questions (to the best of my ability) and removed them to avoid duplication of work. The Regular Notes dealt with in the classroom plus these Amendment notes will cover everything, which you wanted. However, you should always be prepared to expect something new in the exam. It is not a B.Com. exam to expect repeat questions with change in figures.

Index page of this copy will provide you a brief idea about the coverage of syllabus in these notes. I have included the answers to all the questions at respective places to save your time. At some places, I have modified the answers of ICAI and at some places I have changed the presentation of answer. At few places, I have done the spelling corrections and modified the sentence to provide it a complete meaning. I have given special notes, if my opinion differs with ICAI opinion.

I hope you will get benefited and will feel more confident to take up the Institute's Exam. Your suggestions and constructive comments are always welcome to make further improvement. You may use my email id for such suggestions.

TQM says - "There is always a scope for improvement".

Best of Luck and Happy Learning !

CA Rakesh Agrawal

1 May 2019 Exam - Suggested Answer

*Question No. **1** is compulsory*

*Answer any **four** questions from the remaining **five** questions*

Question 1 : [20 Marks]

Audio Tech is a company that designs, develops and sells audio equipments. Audio Tech is best known for its home audio systems and speakers, noise cancelling headphones, professional audio systems and automobile audio systems.

Audio Tech sells audio equipments to consumers through its large network of retail outlets in its home country and via the company's website.

Audio Tech purchases the materials and components that it needs to manufacture audio equipments from a number of different suppliers. All of the purchases are delivered to a company's godown at its factory and are held there until they are needed for production and assembling.

Finished products are transported from the factory to Audio Tech's retail outlets by company's own trucks. The trucks follow the same schedule each week irrespective of the load they are carrying. Audio equipments that are required for sale via the company's website are transported to Audio Tech's distribution centre.

The company believes that it can attract more customers by offering quality products at reasonable prices. Each unit is tested for quality with a real time analyzer ipad app and a calibrated microphone to measure how consistently each sound system reproduced various frequencies. A bass-test sweep tone allows checking how well the subwoofer managed low-end frequencies. Finally, they drive each in cars briefly to see how sound quality changes while on the move.

The company aims to build customer loyalty also through high level of customer services and value chain analysis. The customers can return the product if quality specifications are not met. There is a separate department to handle such complaints.

Audio Tech had implemented Balanced Scorecard as a performance measurement and management system. Company has been doing great on financial parameters and customer satisfaction parameters. Market capitalization of the company has been increased considerably over the years.

Of late, the company has witnessed high employee turnover ratio. Though the company has a formal exit interview process for the resigning employees, the input received from these interviews is rarely considered in improving HR practices. One of the common feedbacks from employees was that working hours are too long and they have to frequently work on weekends also and there is so much pressure to improve customer service without adequate support of system and processes. Also the truck drivers have been on strike thrice in the last one year demanding better pay, retirement benefits and good working conditions.

Audio Tech is keen to address the above issues and recently held a meeting to discuss the performance of the company. The Management Accountant suggested to the Managing Director to use an alternative performance measurement mechanism which considers all the stakeholders instead of just shareholders and customers. The Managing Director is sceptical of the Management Accountant's suggestions and is unclear as to whether they are suitable for the company or not. Therefore, the company seeks your assistance.

Required :

(i) Identify and Explain the various primary activities of Audio Tech in its value chain. Also suggest, if there is any scope for cost reduction in these activities. **(10 marks)**

(ii) Recommend an alternative performance measurement mechanism which considers all stakeholders instead of just shareholders and customers. Also indicate the performance measures as applicable to the situations of Audio Tech in the alternative mechanism suggested by you. **(10 marks)**

Answer 1 :

(i) The Various Primary Activities of Audio Tech in its Value Chain Analysis :

Michael Porter describes the value chain as "internal processes or activities a company performs to design, produce, market, deliver and support its product. Rather than looking at costs as per accounting cost pools, the value chain model focuses on the work flow of an organization in the form of discrete set of activities that are linked to each other. The value chain model is a generic model that examines activities as Primary Activities and Secondary Activities. Passing through each activity, the product or service gains some value. The idea is to (a) eliminate non-value adding activities and (b) identify product differentiating or cost leadership opportunities among the value adding activities.

Individual activities reflect the company's strategy implementation of its strategy and underlying economics of the activities themselves.

Profit margin for the company = Value created less the cost of creating that value

Primary activities are those activities that enable inputs (raw material) to be transformed into output (finished goods) or in the provision of service. Primary activities as per Porter's model are :

Inbound Logistics

Activities related to receiving, storing and distributing the inputs (raw materials) to the production process.

Audio Tech has its materials and components needed to manufacture audio equipment delivered to its godown at the factory premises. These materials are stored until needed for production and assembling at the factory. These are the inbound logistics related activities.

Operations

Activities involved in transforming raw materials into final products. These would include machining, packaging, testing and equipment maintenance.

Audio Tech's work flow activities related to manufacturing of the audio equipment and components need to be considered here. In addition, the testing of equipment using ipad application, bass sweep test as also sound quality check after assembly into the car, are operations related activities.

Outbound Logistics

Activities involved in collecting, storing and distributing the products from the assembly line to the end user customers. This includes finished goods warehousing, delivery vehicle operations, order processing and scheduling.

Some of the activities that would be classified here are :

(a) Storage of Audio Tech's finished goods within factory premises and at its distribution centre.

(b) Scheduling and dispatch of goods using trucks to retail outlets and distribution centres.

(c) Activities related to order taking from retail outlets as well as direct orders on the company's website.

Marketing and Sales

Activities such as advertising, promotion, distribution channel selection, sales force management, pricing policy and such other activities that make the customer aware of the product would be listed here.

All of Audio Tech's activities that relate to the above list of activities whereby it aim to spread customer awareness would be classified here. It aims to build customer loyalty by offering quality products.

Service

Activities related to after sales service such as installation, repair and part replacement would be classified here.

Audio Tech has a separate department to handle customer complaints. Customers can return the product if quality specifications are not met. Also, any activity relating to after sale service would be classified here.

Below are certain measures that Audio Tech can implement to Reduce Costs :

(a) Just in Time raw material procurement system : Procure input materials and components only when needed for production and handling. This would reduce inventory holding costs. Less inventory on hand could also result in savings in storage and material insurance costs. Before implementation, the company needs to consider the risk of loss incurred on account of stock-outs. It needs to develop close relationships with its suppliers to ensure streamlined delivery of inputs. At the same time inputs should meet the required quality standards.

(b) Company's trucks deliver the finished goods to retain outlets as per a fixed schedule each week, irrespective of the load they carry. This indicates that there may be possibilities of dis-economies of cost. If there is a pile up of inventory due to lesser number of truck delivery runs, it could lead to high inventory holding cost. Conversely, economies of delivery cost would creep in. Therefore, the production and truck delivery schedule should be streamlined efficiently and economically.

(c) Audio Tech lays importance in the quality of the product to ensure customer satisfaction. Lower the defects higher the customer satisfaction. It has extensive testing and inspection processes in place. This preventive step should be assessed to find out if it is effective in reducing the cost of poor quality – internal failure cost as well as external failure costs. Internal failure costs (repair, scrap, rework) are associated with defects found after the production but before delivery to the customer. This can be avoided, if quality inspection is done throughout the production work-flow rather than just at the end of production. External failure costs (repairs and servicing, sale returns, warranty claims, complaints) are incurred when the customer finds the product defective and returns it. External failure costs can severely impact customer loyalty and should be minimized.

(d) Audio Tech should invest in preventive and appraisal costs to ensure good quality in order to balance out the cost of poor quality. Preventive costs would include quality planning and assurance, error proofing, quality improvements, education and training. Appraisal costs could be inspection, quality audits, supplier rating etc. Total Quality Management (TQM) and Six Sigma could be effective tools to ensure efficient and good quality production that would minimize cost of poor quality.

(ii) Alternative Performance Measurement Mechanism considering all Stakeholders :

Audio Tech uses Balanced Scorecard to measure performance. Balanced Scorecard focuses on the financial, customer, business, and innovation perspectives. It is given that the company is doing well on financial and customer satisfaction parameters. Market capitalization has also increased over the years, the company is on a growth trajectory. However, the company is facing issues in the form of high employee turnover and dissatisfaction among truck drivers who deliver the goods.

An alternate performance measurement mechanism can be **Performance Prism.** This is a second-generation performance management framework conceptualized by Andy Neely and Chris Adams. The reasons why it would be an effective replacement for models like Balance Scorecard are :

(a) Balanced scorecard focuses on just two of the stakeholders – Investors and Customers. Performance measurement of other stakeholders like employees, suppliers, government etc. have not been considered. The other stakeholders play an important role in the growth of the company's business. Hence, performance measures are needed to monitor both their contribution to the company as well as their overall satisfaction with the company.

(b) Most of the performance models do not focus on the changes that need to be made to strategies and processes. Balanced Scorecard assumes that once the strategies are implemented, measuring a relevant set of metrics of performance will ensure that the rest of the business also functions property. However, this is not true. In the case of Audio Tech, both customers and shareholders are happy with the company's performance. Yet even in a growing business, the drivers of growth, namely other stakeholders like employees and suppliers are not satisfied. Neither is their contribution nor their satisfaction is captured under the Balanced Scorecard performance measurement.

(c) A company has a "Quid Pro Quo" relationship with all its stakeholders. Stakeholders contribute to the company's business while they also derive benefits from it. For example, employees perform their functions well, this is their contribution to Audio Tech's growth. In return, employees would want good working condition and pay to remain motivated and loyal to the company.

Therefore, Performance Prism can be an alternate performance measurement mechanism that considers metrics related to a broader set of stakeholders of an organization, not limited to just customers and shareholders alone.

Five Interrelated Facets of the Performance Prism :

Stakeholder Satisfaction

"Identify the organization's set of stakeholders and their needs"

Unlike a balanced scorecard, the performance prism focuses on all the stakeholders of a company. Audio Tech has satisfied investors and customers, but dissatisfied employees and truck operators. The company must likewise identify all its stakeholders and determine the relative importance of each of the stakeholders. It can use **Mendelow's Matrix** to identify key shareholders in terms of power and interest of stakeholders. A stakeholders group with higher power and high interest (say a trade union) must be kept satisfied.

The main stakeholders of a company are :

- Investors – They want return on investment.
- Customers – They want good quality products at reasonable prices.
- Suppliers – They want better price for procurements or services given.
- Government – They want revenues and development.
- Society at large – They want employment opportunities.

After identification of the stakeholders, the company must identify the requirement of each of the stakeholder group. What must the company do not ensure stakeholder satisfaction?

Audio Tech has to ensure that it improves employee satisfaction in order to reduce its employee turnover. It should also address the issues faced by truck drivers and involve them in a dialogue. If they are not satisfied, the company might suffer financially in the longer run.

Performance Measures : Employee turnover ratio, average employment duration of employees, number of strikes by truck drivers etc.

Stakeholder Contribution

"What the organization expect the stakeholders to contribute and deliver?"

In the second facet, the company has to identify the contribution required from each stakeholder group and must define ways to measure contribution of stakeholders. In turn the company will have something to offer the stakeholders. This is the "Quid Pro Quo" relationship. For example, Audio Tech provides quality products to its customers. The customers in turn contribute towards the profits of the company, they pay a price for the value Audio Tech offers.

Audio Tech should provide for better working conditions to its employees. Motivated employees will perform better and remain loyal to the company. They would drive the growth of the company. Similarly, dialogue with truck drivers would be needed to provide better pay, retirement benefits and good working conditions. Truck drivers in turn need to ensure timely and safe delivery of goods to retail outlets.

Performance Measures : Efficiency of employees, productivity, on time delivery by truck drivers.

Strategies

"What strategies should an organization adopt that derives stakeholder contribution while reciprocating by ensuring their satisfaction?"

The organization should identify strategies that ensures that:

- The wants and needs of the stakeholders are satisfied.
- Stakeholders contribute to the organization's objectives.

Performance measures must be put in place to confirm that the strategies are working. Effective implementation depends on appropriate communication of strategies, implementation by managers and continuous evaluation of appropriateness of strategies.

Audio Tech has to roll out strategies to retain employees by means of better pay, working conditions and growth opportunities within the company. The strategy will be effective when the employee turnover is reduced following these initiatives. Similarly, the issues faced by truck drivers need to be addressed by taking appropriate strategic decisions. The absence of strikes will indicate that these decisions have been effective.

Performance Measures : Employee turnover after implementation of new strategy efficiency of deliveries after issues with truck drivers have been resolved.

Processes

"What are the necessary processes to satisfy the above strategies?"

Processes ensure successful implementation of strategies. Each process could have sub-process. Process owners have to be identified to assign responsibility of functioning of the process.

Processes require continuous evaluation. Instead of evaluating all at once, the company has to identify important processes that are critical to the business. Porter's Value Chain Analysis can be used to identify and evaluate various processes in the organization.

Audio Tech should have well defined processes to hire appropriately skilled personnel for the job, transparent pay structure etc, This process may be owned by the Human Resource Manager. The working condition of truck drivers can be improved by providing sufficient training and better working conditions.

Performance Measures : Number of personnel hired at various skill levels, average payout for each of these skilled groups, hours of employee training, maintenance log of trucks etc.

Capabilities

"What resources should an organization need to effectively operate these processes?"

The company must have the right capabilities in order to support the process. Capabilities could include resources, technology and infrastructure for a particular process to work.

Audio Tech may decide to increase pay/salaries, however it should have sufficient financial resources to make these payments.

Performance Measures : Amount spent of new recruitments and training etc.

Conclusion

"Manage these interlinked facets to cater to all stakeholders"

While meeting targets as defined by performance measures should be emphasized, the performance measurement system should be dynamic and flexible to allow the stakeholders to voice their opinions and expectations as well. Taking their requirements into consideration, along with managing capabilities and processes, Audio Tech can implement effective strategies that will cater to the needs of all stakeholders.

Question 2 : [20 Marks]

Amber Ltd is a leading company in the Footwear Industry. The company has four factories in different locations with state of the art equipments. Due to competition in the market, company is continually reviewing its product range and enhancing its existing products by developing new models to satisfy the demands of its customers.

The company currently has a production facility which has a capacity of 3,500 standard hours per week.

Product 'Comfort' was introduced to the market six months ago and is now about to enter the maturity stage of its life cycle.

However, research by the marketing department indicates that demand of the product 'Comfort' in the market is price sensitive. The likely market responses are as follows :

Selling price per unit (₹)	1,750	1,600	1,525	1,450	1,300
Sales demand per week (units)	550	725	1,000	1,150	1,200

The variable cost per unit of manufacturing 'Comfort' is ₹ 750.

Standard hours used to manufacture one unit is 2 hours.

Product 'Sports' was introduced to the market two months ago using a penetration pricing policy and is now about to enter its growth stage. Each unit a variable cost of ₹ 545 and takes 2.50 standard hours to produce. Market research has indicated that there is a linear relationship between its selling price and the number of units demanded, of the form P = a – bx. At a selling price of ₹ 1,000 per unit, demand is expected to be 1,000 units per week. For every ₹ 100 increase in selling price, the weekly demand will reduce by 200 units and for every ₹ 100 decrease in selling price the weekly demand will increase by 200 units.

Product 'Ethnic' is currently being developed and which is about to be launched in the market. This is a highly innovative designer product which the company believes that it will have a revolutionary impact on the market and consumer behaviour. The company has decided to use a market skimming approach to pricing this product during its introduction stage.

Required :

(a) (i) ADVISE which of the above five selling prices should be charged for product 'Comfort', in order to maximize its contribution during its maturity stage. **(3 marks)**

(ii) CALCULATE the number of units to be produced of product 'Sports' in order to utilize all of the spare capacity from your answer to (i) above and the selling price per unit of product 'Sport' during its growth stage. **(2 + 3 = 5 marks)**

(b) COMPARE penetration and skimming pricing strategies during the introduction stage, using product 'Ethnic' to illustrate your answer. **(4 marks)**

(c) EXPLAIN with reasons, for each of the stages of 'Ethnic' product life cycle, the changes that would be expected in the -

(i) Average unit production cost

(ii) Unit selling price **(4 + 4 = 8 marks)**

Answer 2 :

(a)(i) Selling Price for "Comfort" that would maximize its contribution at Maturity Stage:

Contribution per unit of "Comfort" = Selling Price per unit – Variable Cost per unit

Total Contribution = Contribution per unit x No. Of Units sold

All figures in Rupees

Sales (units) per week	550	725	1,000	1,150	1,200
Selling Price per unit	1,750	1,600	1,525	1,450	1,300
Variable cost per unit	750	750	750	750	750
Contribution per unit	1,000	850	775	700	550
Total Contribution	5,50,000	6,16,250	7,75,000	8,05,000	6,60,000

Advise : Total contribution is maximum when sales are 1,150 units. Therefore, the selling price per unit of "Comfort" should be **Rs. 1,450 per unit.**

(a)(ii) Production Units of "Sports" and Selling Prices per unit :

Amber Ltd. has a production capacity of 3,500 hours per week. As explained in (i) above, it would manufacture 1,150 units of "Comfort" per week. Each unit of "Comfort" requires 2 hours of production. Therefore, total production hours for Comfort would be 1,150 units x 2 hours = 2,300 hours per week.

Production capacity remaining to manufacture "Sports" = 3,500 hours – 2,300 hours = **1,200 hours per week.** Each unit of "Sports" requires 2.5 hours of production.

Therefore, the number of "Sports" units that can be produced = 1,200 hours / 2.5 hours = **480 units per week.**

Linear relationship between Selling Price and Number of Units Demanded has been given to be P = a – bx Where -

P = Selling Price per unit.

a = Selling Price when demand will be zero.

b(slope) = Change in Price / Change in Quantity.

x = Quantity Demanded.

Given, at a Selling Price of Rs. 1,000 per unit, Quantity Demanded will be 1,000 units per week. For every Rs. 100, per unit increase/decrease in Selling Price, the Quantity Demanded will decrease/increase by 200 units per week respectively. A Rs. 500 per unit increase in Selling Price will result in fall of 1,000 units of Sales per week. The Selling Price at which Sales will become Zero shall be : a = 1,000 + 500 = ₹ 1,500 per unit.

b(slope) = Change in Price/Change in Quantity = Rs.100/200 = 0.50

Penetration pricing is most commonly associated with a marketing objective of increasing market share or sales volume, rather than short term profit maximization. Thus, substituting the values in the equation to find the Selling Price of "Sports" when the Quantity Sold is 480 units.

P = a – bx

= 1,500 – 0.50 x (480)

= 1,500 – 240

= ₹ 1,260

Hence, Sports should be sold at ₹ 1,260 per unit during the growth stage.

Alternatively :

Hours after production of Product "Comfort" (3,500 – 1,150 x 2) = 1,200 hours to be utilized to produce product 'Sports".

1,200 hours / 2.5 = 480 units can be produced.

10% increase in selling price will lead to 20% decrease in demand of units of product "Sports". Here, we can produce only 480 units which amounts to 52% decrease in units so the selling price should be increased by 26% as per given price demand function. So, the selling price per unit will be 1,000 + 26% = ₹ 1,260 for 480 units of product "Sports".

Ans.(b) "Ethnic" is given to be a highly innovative product that is about to be launched in to the market. The product with unique features that will differentiate it from other products leading to a revolutionary impact on market and customer behaviour. There seems to be no competitors providing similar products.

Skimming Price Strategy is adopted to charge high prices in the introduction stage in order to recover costs. Skimming Price will be suitable for 'Ethnic' because :

- Market for the product is not yet established. Initially high promotional expenses may have to be incurred to create customer awareness and build a market for the product.
- Due to its innovative feature, the customers would not mind paying a premium for the unique product offering. Demand would be inelastic.
- The market demand is unknown. Initial capital outlay to produce this product may be high, resulting in high cost of production.
- Production and promotional costs in the initial years is likely to be high. Therefore, a higher selling price would help Amber Ltd. to recover the costs faster. Since demand is likely to be inelastic, charging a premium may not be a problem.
- The price can be gradually reduced once the market for the product is established. Competitors may reverse engineer and offer similar products, due to which price may have to be lowered in the long run to retain customers.

Penetration Pricing is adopted to charge a low price in the initial stage for penetrating the market as quickly as possible. For a new product, this low-price strategy will popularize the product. Once the market is established, the price may be increased. Penetration pricing will be suitable when :

- Demand for the product is elastic, i.e. higher demand at lower prices.
- Large scale production of the product yields economies of scale.
- Threat of competition requires prices to be set low. It serves as an entry barrier to prospective competitors as well.

Conclusion : Product 'Ethnic' is an innovative product that the manufacturer believes will change the whole market once it is launched. A strategy of penetration pricing could be effective in discouraging potential new entrants to the market. However, the product is believed to be unique and as such demand is likely to be fairly inelastic. In this instance a policy of penetration pricing could significantly reduce revenue without a corresponding increase in sales. Thus, this strategy is not suitable for 'Ethnic'.

Ans. (c) Impact on Unit Selling Price and Average Cost of Production per unit at each stage of "Ethnic" Product Lifecycle :

Introduction Stage :
As explained in (b) above, at the Introduction Stage of Lifecycle, due to high cost of production and initial promotion expenditure, the unit cost of production will be high. Using Skimming Pricing Policy, the unit selling price will also be high.

Growth Stage :
This is the second phase of Product Life-Cycle. Product awareness with customers would result in increased demand. Therefore, scale of production is likely to increase. The new market segment would attract competitors, who are likely to do reverse engineering and offer similar products in the market. Promotional activities and marketing activities need to continue to maintain and gain market share.
Accordingly, the unit selling price would reduce from the introduction stage on account of the following reasons:

- Competitors offering similar product would take away the uniqueness feature of "Ethnic".
- Again, to gain market share, the unit selling price may have to be lowered to make it attractive to a larger segment of customers.

The unit cost of production is also likely to reduce due to the following reasons:

- Increased production would result in increased material procurement from suppliers. Bulk purchasing discounts can be negotiated with them to lower cost of production.
- Learning curve and experience would enable the labour force to become more efficient. This leads to higher production with the same level of resources leading to cost savings.
- Larger production batches due to increase in scale of operations will reduce the unit variable overhead cost.
- Economies of scale would result due to fixed overhead cost being spread over larger number of units.

Maturity Stage :
The third phase of Product Life-Cycle that is characterized by an established market for "Ethnic". After rapid growth in sale volume in the previous stages, growth of sales for the product will saturate. Competition would be high due to larger number if rivals in the market, this may lead to decrease in market share.
It is likely that the price of the product will be lowered further at the maturity stage in a bid to preserve sales volumes. The company may attempt to preserve sales volumes by employing an extension strategy rather than reducing the selling price. For example, they may introduce product add-ons to the market that are compatible with "Ethnic".

Unit production cost will remain constant due to the following :

- Direct material cost will remain constant. If procurement is lower than the growth phase, it might even lead to slightly higher prices since supplier may not extend bulk discounts.
- The benefits of efficient production due to the effect of learning and experience may also have waned. Therefore, unit labour cost is also likely to remain constant.
- Since scale of production is no longer increasing, the unit variable overhead costs are also likely to remain constant.

Decline Stage

This last stage in the product cycle is characterized by saturated market, declining sales, change in customer's tastes etc. Profitability may slowly start decreasing with fall in sales.

At the decline stage, Product "Ethnic" is likely to have been surpassed by more advanced products in the market and consequently will become obsolete. The company will not want to incur inventory holding costs for an obsolete product and is likely to sell "Ethnic" at marginal cost or perhaps lower.

Sales volumes at the decline stage are likely to be low as the product is surpassed by new exciting products that have been introduced to the market. Furthermore, the workforce may be less interested in manufacturing a declining product and may be looking to learn new skills. For both of these reasons, unit production costs are likely to increase at the decline stage.

Question 3

Excel Ltd. is the leading manufacturer and exporter of high quality leather products - Product A and Product B.

Selling price per unit of Product A and Product B is ₹ 620 and ₹ 420 respectively.

Both the products pass through three processes – Tanning, Dyeing and Finishing during manufacturing process. Allocation of costs per unit of leather products manufactured among the processes are given below :

Particulars	Tanning	Dyeing	Finishing	Total
Direct Materials per unit	140	180	140	460
Direct Labour per unit	90	120	90	300
Cost allocation to Product A	70%	50%	70%	
Cost allocation to Product B	30%	50%	30%	

General overheads per unit of leather products manufactured are ₹ 230 which is allocated equally between Product A and Product B. Above cost allocation is the basis for the decisions regarding pricing of the products.

In this Industry, all the major production processes have environmental impact at all stages of the process including generation of waste, emission of harmful gases, noise pollution, water contamination etc.

The management of the company is worried about the above environmental impact and has taken initiative to preserve the environment like – research and development activities aimed at reducing pollution level, planting trees, treatment of harmful gases and airborne emissions, wastewater treatment etc.

The management of the company desires to adopt Environmental Management Accounting as a part of strategic decision making process. Pricing of products should also factor in environmental cost generated by each product.

General overheads per unit of leather products manufactured are ₹ 230 which includes:

Treatment cost of harmful gases	₹ 80
Wastewater treatment cost	₹ 100
Cost of planting of trees	₹ 20

Process wise information related to generation of wastewater and harmful gases is given below:

Particulars	Tanning	Dyeing	Finishing	Total
Wastewater generated (litres per week)	900	600	0	1,500
Emission of harmful gases (cc per week)	400	300	100	800
Cost allocation to Product A	70%	50%	70%	
Cost allocation to Product B	30%	50%	30%	

The remaining overheads cost and cost of planting trees can be allocated equally between Product A and Product B.

Required :

(a) CALCULATE the product wise profitability based on the original cost allocation. **(2 marks)**

(b) RECALCULATE the product wise profitability based on activity based costing (Environment driven cost). **(5 marks)**

(c) ANALYZE the difference in product profitability as per both the methods. **(2 marks)**

(d) RECOMMEND and EXPLAIN the four management accounting techniques for the identification and allocation of environmental costs. **(8 marks)**

(e) STATE why the management of environmental costs is becoming increasingly important in organizations. Give reasons. **(3 marks)**

Answer 3

Student Note : It is my personal opinion that this question should be kept as an optional question. Because, it is a lengthy and time consuming question. Too many things are asked for total 20 marks. We have simple questions lying ahead.

(a) Product Wise Profitability as per Original Allocation Methodology :

(Figures in Rs. per unit of leather produced)

Particulars	Product A	Product B	Total
Selling price	620	420	1,040
Direct Material (Refer Table 1)	286	174	460
Direct Labour (Refer Table 1)	186	114	300
Overheads (allocated equally)	115	115	230
Total Expenses	587	403	990
Profit	33	17	50
Profitability (%)	**5.32%**	**4.05%**	**--**

Workings :

Table 1 : Direct Cost Allocation to the Products

(Figures in Rs. per unit of leather produced)

Particulars	Tanning			Dyeing			Finishing			Total		
	A	B	Total	A	B	Total	A	B	Total	A	B	Grand Total
Direct Material	98	42	140	90	90	180	98	42	140	286	174	460
Direct Labour	63	27	90	60	60	120	63	27	90	186	114	300

(b) Product wise profitability based on activity based costing using environment driven costs requires the following steps:

- Breakdown of overhead cost of Rs.230 per unit into treatment cost of harmful gases, wastewater treatment cost, cost of planting trees and other overhead costs. Refer Table 2 for the breakup.
- Treatment cost of harmful gases and waste water treatment cost need to be individually allocated to various processes based on relevant cost drivers. Refer Table 3 for cost allocation to process.
- The overheads mentioned in point 2 thus allocated to the various processes, will be further allocated to products based on the specific ratios given in the problem. Refer Table 4 for cost allocation to products.

Product Wise Profitability Statement based on ABC using environment driven costs : (Figures in Rs. per unit of leather products)

Particulars	Product A	Product B	Total
Selling Price	620	420	1,040
Direct Material (Refer Table 1)	286	174	460
Direct Labour (Refer Table 1)	186	114	300
Allocation of Overheads :			
Treatment Cost of Harmful Gases (Refer Table 4)	50	30	80
Wastewater Treatment Cost (Refer Table 4)	62	38	100
Cost of Planting Trees (shared equally)	10	10	20
Other Overhead Cost (shared equally)	15	15	30
Total Expenses	609	381	990
Profit	11	39	50
Profitability %	**1.77%**	**9.29%**	**--**

Workings

Table 2 : Breakup of General Overheads per unit :

Overhead	Amount (Rs.)	Allocation basis between process / products
Treatment Cost of Harmful Gases	80	Emission of Harmful Gases (cc per week)
Wastewater Treatment Cost	100	Wastewater Generated (litres per week)
Cost of Planting Trees	20	Equally between Products A and B
Other Overheads (balancing figure)	30	Equally between Products A and B
Total General Overheads per unit	230	

Table 3 : Allocation of Treatment Cost to various processes :

Overhead	Amount (Rs)	Allocation Basis	Tanning (Rs.)	Dyeing (Rs.)	Finishing (Rs.)
Treatment Cost of Harmful Gases	80	4 : 3 : 1	40	30	10
Wastewater Treatment Cost	100	9 : 6 : 0	60	40	0

Table 4 : Allocation of Overhead Cost to Products A and B

Overhead	Tanning	Dyeing	Finishing	Total
Treatment Cost of Harmful Gases	40	30	10	80
Cost Allocation % to Product A	70%	50%	70%	
Cost Allocation % to Product B	30%	50%	30%	
Cost Allocation to Product A	28	15	7	50
Cost Allocation to Product B	12	15	3	30
Wastewater Treatment Cost	60	40	0	100
Cost Allocation % to Product A	70%	50%	70%	x
Cost Allocation % to Product B	30%	50%	30%	x
Cost Allocation to Product A	42	20	-	62
Cost Allocation to Product B	18	20	-	38

(c) Analysis of the difference in product profitability as per both the methods :

In the first method, general overhead costs are allocated to the products A and B, irrespective of the environment costs that each product incurs. General overhead costs are allocated to each product equally. The resultant product profitability shows that Product A yields 5.32% and Product B yields 4.05% profitability. Therefore, the Excel Ltd. would conclude that Product A is more profitable.

In the next method, general overhead costs are bifurcated to identify "hidden" environment costs that are incurred on account of manufacturing these products. Environmental costs are first traced to the process that generates harmful gases and wastewater, for which treatment is done. It can be seen that Tanning process, followed by Dyeing and Finishing process generates the maximum amount of waste. Therefore, by apportioning the cost based on the waste generated, more cost is allocated to Tanning process. Similarly, Dyeing and Finishing are allocated lesser cost since they do not generate as much waste. It is further given that 70% of the cost of Tanning relates to Product A. This is much higher than the 50% that was allocated to Product A as per the first method.

Accordingly, the revised workings show that Product A yields 1.77% and Product B yields 9.29% profitability. The reason being Product A generates more environment driven costs as compared to Product B.

Excel Ltd. would therefore increase the selling price of Product A, if it wants to maintain profitability as per the original method. However, the more sustainable approach would be to find out ways of reducing wastewater and harmful gases in the manufacturing process. This would in turn result in reduction of environmental driven costs such as wastewater treatment and treatment of harmful gases. This would sustain profits in the long run.

(d) Four Techniques for the identification and allocation of Environmental Costs :

Input-Output Analysis : This technique monitors the material input with the output that is produced. For example, if 100 kg of material have been bought as input in the process resulting in 80 kg output material, the 20 kg must been accounted for in some way. Some part of this may say 10% (2 kg) may have been sold as scrap while the remaining 90% (18 kg) of it may be waste. Possibly scrap can be reused therefore may have neutral environment impact. The company can then concentrate on minimizing waste generation.

Flow Cost Accounting : This technique uses not only material flows but also the organizational structure. Classic material flows are recorded as well as material losses incurred at various stages of production. Flow cost accounting makes material flows transparent. It tracks :

(i) Quantities (physical data)
(ii) Costs (monetary data) and
(iii) Values = (quantities x costs)

Material flows are divided into three categories : material, system, and delivery/disposal.

(i) The material values and costs apply to the materials which are involved in the various processes.
(ii) The system values and costs are the in-house handling costs, which are incurred inside the company for the purpose of maintaining and supporting material throughput. Example, personnel costs or depreciation.
(iii) The delivery and disposal values and costs refer to the costs of flows leaving the company. For example, transport costs or cost of disposing waste.

The focus of flow cost accounting is on reducing the quantities of materials, which leads to increased ecological efficiency.

Life Cycle Costing : This technique considers the costs and revenues of a product over its whole life rather than one accounting period. Therefore, the full environmental cost of producing a product will be taken into account. In order to reduce lifecycle costs, an organization may adopt a TQM approach. Good environmental management is increasingly recognized as an essential component of TQM. Such organizations pursue objectives that may include zero complaints, zero spills, zero pollution, zero waste and zero accidents. Information system needs to be enabled to support such environmental objectives via provision of feedback of the organizational efforts in achieving such objectives.

Activity Based Costing (ABC) : ABC allocates internal costs to cost centres and cost drivers on the basis of the activities that give rise to the costs. Environment-related costs can be attributed to joint cost centres and environment-driven costs are hidden on general overheads. Environment-driven costs are removed from general overheads and traced to products or services. The cost drivers are determined on environmental impact that activities have and costs are charged accordingly. This should give a good attribution of environmental costs to individual products that should result in better control of costs.

(e) Reasons why environmental costs is becoming important in organizations :

(i) "Carbon footprint" measures the total greenhouse gas emissions caused directly and indirectly by a person, organization, event or product. People are now becoming aware about the carbon footprint and recycling. Several companies have initiated CSR committees as they feel that portraying themselves as environmentally responsible makes them popular among their consumers.

(ii) Environmental costs are becoming huge for some companies particularly those operating in highly industrialized sectors such as oil production. Such significant costs need to be managed.

(iii) Regulation is increasing worldwide at a rapid pace, with penalties for non-compliance also increasing accordingly.

Question 4(a) - [10 Marks]

GRV is a chemical processing company that produces sprays used by farmers to protect their crops. One of these sprays 'Agrofresh' is made by using either chemical A or chemical B. To produce one litre of Agrofresh spray they have the option to use either 12 litres of chemical A or 12 litres of chemical B. During the financial year, the purchase department of GRV has planned to use chemical B as it appeared that it would be the cheaper of the two and their plans were based on a cost of chemical B of ₹ 15 per litre.

Due to subsequent market movement during the year, the actual prices changed and if the concerned department had purchased efficiently, the cost would have been

Chemical A	₹ 15.40 per litre
Chemical B	₹ 16.00 per litre

Production of Agrofresh spray was 1,000 litres and the usage of chemical B was 12,800 litres at a cost of ₹ 2,09,920.

You are the CEO of GRV and the Management Accountant has sent to you the following suggestions through e-mail :

"I feel that in our particular circumstances the traditional approach to variance analysis is of little use as for some of our products we can utilize one of several equally suitable chemicals and we always plan to use such chemical which will lead to cheapest production costs. However due to sharp market movements, we are frequently trapped by the sharp price changes which lead to the choice of expensive alternative at the end."

To check the reality in the content of the mail, your CEO asked you, the Cost Accountant of the company :

(i) To CALCULATE the material variances for Agrofresh by using
- Traditional Variance Analysis
- Planning and Operational Variances **(6 marks)**

(ii) To ANALYSE how planning and operational variances approached the variances. **(2 marks)**

(iii) To ANALYSE how the advanced variances are useful to your organisation. **(2 marks)**

Question 4(b) - [10 Marks]

DK International is developing a new product. During its expected life, 16,000 units of the product will be sold for ₹ 102 per unit.
Production will be in batches of 1,000 units throughout the life of the product.
The direct labour cost is expected to reduce due to the effects of learning for the first eight batches produced. Thereafter, the direct labour cost will remain constant at the same cost per batch as in the 8^{th} batch.
The direct labour cost of the first batch of 1,000 units is expected to be ₹ 55,000 and a 90% learning effect is expected to occur. The direct material and other non-labour related variable costs will be ₹ 50 per unit throughout the life of the product.
There are no fixed costs that are specific to the product.
The learning index for a 90% learning Curve = - 0.152; $8^{-0.152} = 0.729$; $7^{-0.152} = 0.744$

Required :

(i) CALCULATE the expected direct labour cost of the 8^{th} batch. **(3 marks)**

(ii) CALCULATE the expected contribution to be earned from the product over its lifetime. **(3 marks)**

(iii) CALCULATE the rate of learning required to achieve a lifetime product contribution of ₹5,00,000, assuming that a constant rate of learning applies throughout the product's life. **(4 marks)**

Answer 4(a) :

(i) Traditional Variances :

Total Variance	=	(SQ x SP) - (AQ x AP)
	=	(12,000 x 15) - (12,800 x 16.40)
	=	₹ 1,80,000 - ₹ 2,09,920
	=	₹ 29,920 (A)
Usage Variance	=	SP x (SQ - AQ)
	=	₹ 15 x (12,000 lt – 12,800 lt)
	=	₹ 12,000 (A)
Price Variance	=	AQ x (SP - AP)
	=	12,800 lt x (15.00 – 16.40)
	=	₹ 17,920 (A)

Operational Variances :

Hint : Use Circular Tally to derive the formulae -

Revised Usage Variance	=	Revised SP of B x (SQ - AQ)
	=	₹ 16 x (12,000 lt – 12,800 lt)
	=	₹ 12,800 (A)
Revised Price Variance	=	AQ x (Revised SP of B - AP of B)
	=	12,800 lt x (16.00 – 16.40)
	=	₹ 5,120 (A)
Total Operational Variance	=	Rs.12,800 (A) + Rs.5,120 (A)
	=	Rs.17,920 (A)

Planning Variances :

Controllable Variance	=	SQ x (Revised SP of A - Revised SP of B)
	=	12,000 lt x (15.40 – 16.00)
	=	₹ 7,200 (A) [Due to error in decision making]

Note : In my personal opinion, this variance is uncontrollable, because we didn't knew what would be the price of material in future, while taking the decision of buying A or B. But ICAI has its own interpretation. For scoring marks, you may write what ICAI likes to read. Secondly, Planning variances are by default uncontrollable variances.

Uncontrollable Variance	=	SQ x (SP of B - Revised SP of A)
	=	12,000 lt x (15.00 – 15.40)
	=	₹ 4,800 (A) [Due to price fluctuation]
Total Planning Variance	=	₹ 7,200 (A) + ₹ 4,800 (A)
	=	₹ 12,000 (A)
Tally with Total Cost Variance	=	Total Operational Var. + Total Planning Var.
	=	₹ 17,920 (A) + ₹ 12,000 (A)
	=	₹ 29,920 (A)

(ii) Traditional variance analysis is applied based on the assumption that whole of the variance is due to operational deficiencies and the planning associated with setting the original standard is perfectly correct. But this assumption is not practical. When the conditions are volatile and dynamic, traditional variances need to be analysed into planning and operational variances. Planning variances try to explain the extent to which the original standards needs to be adjusted to reflect changes in operating conditions between the current situation and that imagined when the standard was originally derived. Planning variances are generally not controllable and may need to revise to cater the changes due to environmental / technological changes at a later stage. In certain situations, planning variances can be considered controllable as well. [Note : I don't agree with this sentence of ICAI]. Whereas operational variances explain the extent to which adjusted standards have been achieved. Operational variances are calculated after the planning variances have been established and are thus a realistic way of assessing performance. So, it indicates a reality check of traditional variance analysis.

In GRV, as per traditional approach total variances are ₹ 29,920 (Adverse), out of which ₹ 17,920 (Adverse) accounts for total operational variance and ₹ 12,000 (Adverse) is for total planning variance. It is necessary to analyse planning variances further. The planning variance of ₹ 12,000 (adverse) can be divided into an uncontrollable adverse variance of ₹ 4,800 and a controllable adverse variance of ₹ 7,200. Similarly, total operational variance can be sub classified as adverse price variance of ₹ 5,120 and adverse usage variances of ₹ 12,800. This analysis gives a clearer indication of the inefficiency of the purchasing function by the concerned department. Performance of the staff of the purchasing department should be evaluated / rewarded based on variances which are controllable. If an adverse uncontrollable variance of ₹ 4,800 is reported in the performance reports this is likely to lead to dysfunctional effects to the purchase department. [Note : In my personal opinion, Purchase Department is not responsible for the entire Planning Variance.]

(iii) In today's cut-throat competition, managers must react quickly and accurately to the changes in technology, price fluctuation, consumer tastes, laws and regulations, economic conditions, political conditions and international conditions etc. which are changing rapidly and dramatically. Accordingly, management accountant should be able to provide necessary inputs by a proper analysis of the things that pertains to his/her area like effect of changes in price. The unique features of advanced variance analysis are that, it considers different market conditions and changes in the dynamic environment.

Moreover, advanced variances classify variances into controllable and uncontrollable variances and helps the management to find out reasons for adverse variances so that corrective action can be taken. Similarly, if any adverse variances have arrived, because of changes in the market condition like inflation, it has to be differentiated from the other variances.

GRV is a type of organization where management of performance can be done only through advanced variance analysis. Advanced variance analysis of GRV shows that it has adverse planning variance as well as adverse operational variance. Further, the emergence of controllable and uncontrollable variances makes it a perfect case of advance variance analysis in GRV. Sharp price changes which lead to the choice of expensive alternative and efficiency of purchase department need to be analyzed, reported, and dealt separated by the joint effort of the management accountant and the top management. Hence, advanced variance analysis in GRV is an absolute necessity.

Answer 4(b) :

(i) Total Direct Labour Cost for first 8 batches based on learning curve of 90% shall be :

$y = ax^b$

Where,

y = Average Direct Labour Cost per batch for 'x' batches

a = Direct Labour Cost for first batch

x = Cumulative No. of batches produced

b = Learning Coefficient Index

$y = ₹ 55,000 \times (8)^{-0.152}$

$= ₹ 55,000 \times 0.729$

= ₹ 40,095 [It can be calculated using doubling approach also]

Total Direct Labour Cost for first 8 batches shall be -

= 8 batches x ₹ 40,095

= ₹ 3,20,760

Total Direct Labour Cost for first 7 batches based on learning curve of 90% shall be :

$y = ₹ 55,000 \times (7)^{-0.152}$

$= ₹ 55,000 \times 0.744$

= ₹ 40,920

Total Direct Labour Cost for first 7 batches

= 7 batches x ₹ 40,920

= ₹ 2,86,440

Hence, Direct Labour Cost for 8th batch shall be :

= Total cost for first 8 batches - Total cost for first 7 batches

= ₹ 3,20,760 – ₹ 2,86,440

= ₹ 34,320

(ii) Statement Showing "Life Time Expected Contribution"

Particulars	**Amount (₹)**
Sales (₹ 102 x 16,000 units)	16,32,000
Less : Direct Material and Other Non Labour Related Variable Costs (₹ 50 x 16,000 units)	8,00,000
Less : Direct Labour Cost using LCR [Cost of first 8 batches + Cost of next 8 batches] [₹ 3,20,760 + (₹ 34,320 x 8 batches)]	5,95,320
Hence, Expected Contribution	2,36,680

(iii) In order to achieve a Contribution of ₹ 5,00,00,000 the Total Direct Labour Cost over the Product's Lifetime should be :

Statement Showing "Life Time Direct Labour Cost"

Particulars	Amount (₹)
Sales (₹ 102 x 16,000 units)	16,32,000
Less : Direct Material and Other Non Labour Related Variable Costs (₹ 50 x 16,000 units)	8,00,000
Less : Desired Life Time Contribution	5,00,000
Hence, Direct Labour (balancing figure)	3,32,000

Average Direct Labour Cost per batch for 16 batches shall be -

= ₹ 3,32,000 / 16 batches = ₹ 20,750

Average Direct Labour cost for 16 batches based on learning curve of r% shall be :

$$y = ₹\ 55{,}000 \times (16)^b$$

$$₹\ 20{,}750 = ₹\ 55{,}000 \times (16)^b$$

$$0.3773 = (16)^b$$

Taking log of both sides, we get -

$$\log 0.3773 = b \times \log (16)$$

$$\log 0.3773 = b \times \log 2^4$$

$$\log 0.3773 = b \times 4 \log 2$$

$$\log 0.3773 = \frac{\text{Log LCR}}{\text{Log 2}} \times 4 \log 2$$

$$\log 0.3773 = \log LCR^4$$

$$0.3773 = r^4$$

$$r = \sqrt[4]{0.3773}$$

$$r = 78.37\%$$

Alternatively

Using doubling approach, the average cost of first batch ₹ 55,000 should get reduced to ₹ 20,750 after first 16 batches. If we assume the LCR as 'r', then the equation shall be -

$$₹\ 20{,}750 = (₹\ 55{,}000 \times r \times r \times r \times r)$$

$$₹\ 20{,}750 = (₹\ 55{,}000 \times r^4)$$

$$20{,}750 / 55{,}000 = r^4$$

$$0.3773 = r^4$$

$$r = \sqrt[4]{0.3773}$$

$$r = 78.37\%$$

Question 5(a) - [10 Marks]

(i) Name any two competition-based pricing methods. **(2 Marks)**

(ii) RECOMMEND the Pricing Strategy to be adopted with reference to the following situations. You are not required to explain the reasons for your answer.

a. Star Coffee Shop follows the practice of keeping the price of its coffee or service artificially high in order to encourage favourable perceptions among buyers, based solely on the price.

b. Sky TV gave away their satellite dishes for free in order to set up a market for them.

c. Princeton Hotels Ltd. follows a competitive pricing method under which it tries to keep its price at an average level charged by the Industry.

d. Eddisson Enterprises has piled up stocks in large quantities and the market price has fallen.

e. Aqua LLP follows a new product pricing strategy through which company makes profitable sales by selling out few units.

f. X Ltd. produces Product X a revolutionary product and as a reward for innovation and for taking first initiative which pricing strategy should X Ltd. adopt?

g. An established company has recently entered the stationery market segment and launched quality paper for printing at home and office.

h. D is a perishable item, with more than 80% of its shelf life is over.

(1 x 8 = 8 Marks)

Question 5(b) - [10 Marks]

RK Ltd., which is producing a product prepared a budget for the next year as follows:

Fixed Cost p.a.	₹ 12,60,000
Variable Cost p.u.	₹ 25
Production	1,80,000 units

Selling price – Cost plus 25% mark up on total budgeted cost.

When these budgeted figures and the pricing approach were informed to the Marketing Manager, he came out with a remark that the demand for the product is more price sensitive and he expected the demand under various prices as given below :

Selling Price p.u. (₹)	36	38	40	42	44
Annual Demand (units)	1,74,000	1,62,000	1,50,000	1,38,000	1,25,000

The Marketing Manager further informed that a wholesale dealer is ready to buy the entire production of the company at a price of ₹ 32 p.u. In that situation he expected a savings of ₹ 2 p.u. in the selling expenses which are a part in the above stated variable cost.

Required :

EVALUATE the situation and advice the most profitable course of action. **(10 Marks)**

Answer 5(a) :

(i) Competition Based Pricing Methods – Going Rate Pricing and Sealed Bid Pricing

(ii)
a. Premium Pricing
b. Penetration Pricing
c. Going Rate Pricing
d. Pricing Below Marginal Cost
e. Skimming Pricing
f. Premium Pricing
g. Market Price
h. Any Cash Realizable Value

Answer 5(b) :

The company has a plan to produce 1,80,000 units and it proposed to adopt Cost plus Pricing approach with a markup of 25% on full budgeted cost. To achieve this pricing policy, the company has to sell its product at the price calculated below :

Quantity to be sold	1,80,000 units
Total Variable Cost (1,80,000 units x ₹ 25)	₹ 45,00,000
Add : Fixed Cost	₹ 12,60,000
∴ Total Budgeted Cost	₹ 57,60,000
Add : Profit (25% of ₹ 57,60,000)	₹ 14,40,000
∴ Total Revenue (need to earn)	₹ 72,00,000
Selling Price per Unit [₹ 72,00,000 / 1,80,000 units]	₹ 40 p.u.

However, at selling price ₹ 40 per unit, the company can sell 1,50,000 units only, which is 30,000 units less than the budgeted production units.

After analyzing the price-demand pattern in the market (which is price sensitive), to sell all the budgeted units market price needs to be further lowered, which might be lower than the total cost of production.

Statement Showing "Profit at Different Demand & Price Levels"

Particulars	**I**	**II**	**III**	**IV**	**V**	**Dealer**
Demand (Units)	1,74,000	1,62,000	1,50,000	1,38,000	1,25,000	1,80,000
Capacity used (%)	96.67%	90.00%	83.33%	76.67%	69.44%	100%
	₹	₹	₹	₹	₹	₹
Selling Price p.u.	36	38	40	42	44	32
Variable cost p.u.	25	25	25	25	25	23
Contribution p.u.	11	13	15	17	19	9
Total Contribution	19,14,000	21,06,000	22,50,000	23,46,000	23,75,000	16,20,000

Advice :

(i) Taking the above calculation and analysis into account, the company should produce and sell 1,25,000 units (i.e. near to 70% of budgeted production) at ₹ 44 per unit. At this price RK can earn maximum contribution and profit as compared to other options.

(ii) Sell to wholesale dealer is not a financially viable option. Instead RK may explore other opportunities to utilize additional capacity i.e. 30%. For example, international expansion through e-commerce website or outsource the unutilized capacity to others to earn additional revenue.

Question 6(a) - [10 Marks]

Raju is Chief Financial Officer of Millets.com, an internet company that enables customer to order for delivery of different millets by accessing its website. Raju is concerned with the efficiency and effectiveness of the financial function. He collects the following information for three finance activities in 2018.

Rate per unit of Cost Driver :

Activity	Activity level	Cost Driver	Static Budget Amount (₹)	Actual Amount (₹)
Receivables	Output unit	Remittance	6.39	7.50
Payables	Batch	Invoices	29.00	28.00
Travel expenses	Batch	Travel claims	76.00	74.00

The output measure is the number of deliveries which is the same as the number of remittances.

The following additional information are also given.

Particulars	Budgeted	Actual
Number of deliveries	10,00,000	9,48,000
Delivery Batch size	5	4.468
Travel expenses Batch size	500	501.587

Required :

CALCULATE the flexible budget variances for 2018 to :

(i) Receivable Activities **(2 Marks)**

(ii) Payable Activities **(4 Marks)**

(iii) Travel expense Activities **(4 Marks)**

(Ignore fractions in all calculations)

Question 6(b) - [10 Marks]

The information given below pertains to ABC Enterprises, a specialized car garage door installation company. ABC Enterprises use to get multiple service calls from the customers with variety of requirements. They may have to Install, Replace, Adjust or Lubricate some part or other to make the door functional. They work with 5 parts as given in the table namely Door, Motor, Track, Trimmer and T-Lock.

S.N.	Parts	Type of Service				Total
		Install	Replace	Adjust	Lube	
1	Door	2	5	1	0	**8**
2	Motor	3	2	16	9	**30**
3	Track	5	0	6	6	**17**
4	Trimmer	14	6	0	0	**20**
5	T-Lock	5	0	1	0	**6**
6	Miscellaneous	0	2	1	1	**4**
	Total	**29**	**15**	**25**	**16**	**85**

Required :

(i) Using the above data, carry out a Pareto Analysis (80/20 rule) of Total Parts. **(3 Marks)**

(ii) Using the same data carry out the second level Pareto Analysis on the type of services with respect to Motors only. **(2 Marks)**

(iii) Give your recommendations on the basis of your calculations in (i) and (ii) above. (Do calculations to two decimals only) **(5 Marks)**

OR

State the business situations in which you recommend to apply Pareto Analysis. **(5 Marks)**

Answer 6(a) :

Activity-based costing, flexible-budget variances for finance function activities :

Student Notes :

- Flexible Budget means calculation of standard cost for actual activity. Then it can be compared with actual cost to get the cost variance. It is the normal way of calculation of variances. ICAI has clubbed standard costing with activity based costing.
- Millets means different variety of foodgrains. It means, this company will sell foodgrains online.

(i) Receivable Activities :

Receivables is an output unit level activity. Its flexible-budget variance can be calculated as follows:

= Flexible Budget Costs – Actual Costs
= (₹ 6.39 x 9,48,000) – (₹ 7.50 x 9,48,000)
= ₹ 60,57,720 – ₹ 71,10,000
= ₹ 10,52,280 (A)

(ii) Payable Activities : Payables is a batch level activity

	Particulars	Static-Budget	Actual
a	Number of deliveries	10,00,000	9,48,000
b	Batch size (units per batch)	5	4.468
c	Number of batches (a / b)	2,00,000	2,12,175
d	Cost per batch	₹ 29	₹ 28
e	Total payables activity cost (c x d)	₹ 58,00,000	₹ 59,40,900

Step 1: The number of batches in which payables should have been processed

= 9,48,000 actual units / 5 budgeted units per batch

= 1,89,600 batches

Step 2 : The flexible-budget amount for payables shall be

= 1,89,600 batches x ₹ 29 budgeted cost per batch

= ₹ 54,98,400

The flexible budget variance can be computed as follows :

= Flexible Budget Costs – Actual Costs

= (1,89,600 x ₹ 29) – (2,12,175 x ₹ 28)

= ₹ 54,98,400 – ₹ 59,40,900

= ₹ 4,42,500 (A)

(iii) Travel Expense Activities : Travel expenses is a batch level activity.

	Particulars	**Static-Budget**	**Actual**
a	Number of deliveries	10,00,000	9,48,000
b	Batch size (units per batch)	500	501.587
c	Number of batches (a / b)	2,000	1,890
d	Cost per batch	₹ 76	₹ 74
e	Total payables activity cost (cxd)	₹ 1,52,000	₹ 1,39,860

Step 1 : The number of batches in which the travel expenses should have been processed

= 9,48,000 actual units / 500 budgeted units per batch

= 1,896 batches

Step 2 : The flexible budget amount for travel expenses shall be

= 1,896 batches x ₹ 76 budgeted cost per batch

= ₹ 1,44,096

The flexible budget variance can be calculated as follows :

= Flexible Budget Costs – Actual Costs

= (1,896 batches x ₹ 76) – (1,890 batches x ₹ 74)

= ₹ 1,44,096 – ₹ 1,39,860

= ₹ 4,236 (F)

Answer 6(b) :

(i) Statement Showing "Pareto Analysis of Total Parts"

Parts	No. of Items	% of Total Items	Cumulative %
Motor	30	35.29%	35.29%
Trimmer	20	23.53%	58.82%
Track	17	20.00%	78.82%
Door	8	9.41%	88.23%
T-Lock	6	7.06%	95.29%
Miscellaneous	4	4.71%	100.00%
Total	85	100.00%	

(ii) Statement Showing "Pareto Analysis of Type of Services (for Motor)"

Service Type	No. of Items	% of Total Items	Cumulative %
Adjust	16	53.33%	53.33%
Lube	9	30.00%	83.33%
Install	3	10.00%	93.33%
Replace	2	6.67%	100.00%
Total	30	100.00%	

(iii) Pareto Analysis is a rule that recommends focus on most important aspects of the decision making in order to simplify the process of decision making. The very purpose of this analysis is to direct attention and efforts of management to the product area where best returns can be achieved by taking appropriate actions.

Pareto Analysis is based on the 80/20 rule which implies that 20% of the products account for 80% of the revenue. But this is not the fixed percentage rule. In general business sense, it means that a few of the products, goods or customers may make up most of the value for the firm.

The present case stands in a difference to 80/20 rule. Because the company installs doors, they sometimes have multiple service calls to install each door piece by piece. They may have to install, replace, adjust, or lubricate some part to get the door working properly. They work with five main parts i.e. door, motor, track, trimmer and t-lock. The service calls with reference to motors are heavy and accounted for as much as 35.29% of the number of calls attended. Motor together with trimmer accounted for 58.82%. So, these two parts are to be considered as key parts and ABC enterprises must be ever ready to cater to all provisional requirements for attending these classes without any inordinate delay. Any delay in service of these calls is likely to damage its service rendering reputation within a very short span of time. Further, the second level Pareto Analysis on motors has revealed a particular reference to the service problems related to motors. Adjustments and Lubrication issues cover up 83.33% of the total service problems exclusively connected to Motors. So, ABC Enterprise must direct its best efforts and develop specific expertise to solve these problems in the best interest of the customers.

OR

Pareto Analysis is generally applicable in the following business situations.

Pricing of a Product :

- In the case of a firm dealing with multi products, it would not be possible for it to analyse cost-profit-price-volume relationships for all of them. In practice, in case of such firms approximately 20% of products may account for about 80% of total sales revenue. Pareto Analysis is used for analysing the firm's estimated sales revenues from various products and it might indicate that approximately 80% of its total sales revenue is earned from about 20% of its products.

Customer Profitability Analysis :

- Instead of analysing products, customers can be analysed for their relative profitability to the organisation. Again, it is often found that approximately 20% of customers generate 80% of the profit. There will always be some customers who are less profitable than others, just as some products are less profitable than others. Such an analysis is useful tool for evaluation of the portfolio of customer profile and decision making such as whether to continue serving a same customer group, what is the extent of promotion expenses to be incurred.

ABC Analysis – Stock Control :

- Another application of Pareto analysis is in stock control where it may be found that only a few of the goods in stock make up most of the value. In practice, approximately 20% of the total quantity of stock may account for about 80% of its value. The outcome of such analysis is that by concentrating on small proportion of stock items that jointly accounts for 80% of the total value, a firm may will be able to control most of monetary investment in stocks.

Application of Activity Based Costing :

- In Activity Based Costing it is often said that 20% of an organisation cost drivers are responsible for 80% of the total cost. By analysing, monitoring and controlling those cost drivers that cause most cost, a better control and understanding of overheads will be obtained.

Quality Control :

- Pareto analysis seeks to discover from an analysis of defect report or customer complaints which "vital few" causes are responsible for most of the reported problems. Often, 80% of reported problems can usually be traced to 20% of the various underlying causes. By concentrating one's efforts on rectifying the vital 20%, one can have the greatest immediate impact on product quality.

* * * * *

2

November 2019 - Suggested Answers

Question No. 1 is compulsory.

Candidates are also required to answer any **four** questions from the remaining **five** questions.

Working notes should form part of the answer.

No statistical or other table will be provided with this question paper.

1. Cure Hospital is running under private-public-partnership (PPP) model-providing treatment for non-communicable diseases. ABCO Hospitals Limited is the private partner which runs a chain of hospitals on profit basis in major cities in India. The public partner is the State Government. Cure Hospital is a "not-for-profit" hospital.

Private partner is to invest in upgrading and equipping the facility and responsible for operational management and service delivery. Government to provide physical space and other infrastructure in "as is where is" condition, provide support facilities and hospital amenities. Private partner assumes the entire responsibility for a full range of investment, operation and maintenance functions. Private partner has the authority to make daily management decisions.

The hospital is funded to a great extent by the State Government and a fixed level of funding is received from the government each year out of the State budgetary allocation. It is up to the hospital to allocate this fund to different areas such as doctors' and other staff salaries, medicines and all other costs required to run a hospital.

Cure Hospital's objectives are :

- to give prompt access to high quality medical treatment for patients.
- to provide free treatment to poor patients in line with government policy of inclusive development.
- to provide value for money for the taxpayer-measured by 3 Es framework of Economy, Efficiency and Effectiveness.
- to contribute to medical science by developing innovative ways to deliver treatment to patients.

Except select surgeries, all services are free for poor patients that are below poverty line (BPL) card holders. 40% beds are reserved for poor patients. Free out patient department (OPD) services to poor. CT Scan and MRI diagnostics are free for poor patients, subsidised rates for others. Cure Hospital also runs a generic medicine shop inside the hospital premises which sells medicines to all patients at discount ranging from 40% to 56% - the only shop of this kind in the city.

WHO has agreed to provide financial and technical support to the neonatal care unit. The hospital enabled it to obtain five accreditation certificates from various leading authorities on different aspects of hospital management.

Feedback is taken from each in-patient about the quality of service provided by the hospital and the satisfaction level is taken in 1 to 10 point scale. 1 being the least satisfied and 10 represents totally satisfied.

In a recent meeting of the managing committee of the hospital, discussions were held about inadequate performance measurement systems in place to assess whether the hospital is achieving its objectives and that insufficient attention is given to the importance of non-financial performance indicators.

A four member team consisting of a performance management expert and three senior doctors was created to give their advice in these aspects.

The four member team met with doctors, staff and other stakeholders at length and breadth. Some of the conversations were as below :

Doctor A : I think the hospital always delivers value for money. We have always achieved our total financial budgets.

Doctor B : We work here much longer hours than doctors in other hospitals, often without being paid for working overtime.

Doctor C : There is not enough government and private partner funding to recruit more doctors and paramedic staff.

Doctor D : Number of out-patients has increased considerably. Earlier an out-patient had to wait for an average period of 2 hours 20 minutes and now the same has increased to 3 hours.

Senior Doctor K : I do not know how much time we spend developing innovative ways to deliver treatment to patients though, as most of the performance data we doctors receive relates to financial targets.

In-patient H : Incompetent paramedic staff, poor quality of food and bed linen.

Staff M : Management undermines our role in running the hospital.

Recent performance data of the hospital vis-a-vis national average are as follows :

Particulars	**Cure Hospital**	**National average of other PPP run hospitals**
Number of doctors	80	76
Average doctors' salaries per month including overtime	₹ 1,20,000	₹ 1,60,000
Average doctors' salaries including overtime as per budget	₹ 1,20,000	₹ 1,25,000
Number of in-patients treated	8,360	6,369
Average satisfaction rating of in-patients	6	9
Number of patients readmitted for treatment of the same ailment within short period of time after discharge from the hospital	627	128
Average staff satisfaction rating (0% represents totally dissatisfied and 100% represents totally satisfied)	16%	86%
Number of out-patients treated	76,212	63,318

Required :

(a) Explain why non-financial performance indicators are particularly important to measure the performance of "not-for-profit" organisations such as Cure Hospitals.

[4 Marks]

(b) Evaluate whether Cure Hospital is delivering value for money for each of the components of the value for money framework.

[12 Marks]

(c) The CEO of the hospital intends to introduce a nominal fee for out-patient treatment given to poor patients and remove subsidised rate of CT Scan and MRI diagnostic for other patients in order to achieve its objectives in a better way. Evaluate the proposal of the CEO.

[4 Marks]

Answer 1 :

(a) Cure Hospital has been formed in a public-private partnership to provide quality healthcare to the public, with *focus on the poorer sections of the society*. Healthcare service is provided for free, except for select surgeries. A sufficient portion of its capacity (hospital beds) is reserved entirely for Below Poverty Line (BPL) patients. Generic medicines are provided at a discounted price, to make them more affordable. World Health Organization (WHO) has decided to fund its neo-natal unit. With all this information, it can be summarized that Cure Hospital has been formed "not-for-profit" objective, attending to a social cause of providing quality healthcare to the economically poorer sections of the society.

Cure Hospital has been formed in partnership with ABCO Hospitals Ltd. and the State Government. The State Government has provided physical space, infrastructure, other support facilities and hospital amenities. ABCO Hospital, the private partner has the entire responsibility of taking care of allocation of funds, investment, operations, and maintenance functions. Daily management decisions are also handled by the private partner.

Since the Government has provided substantial funding and facilities to Cure Hospital, it owes a fiduciary responsibility of reporting the financial measures to its stakeholders, the government in this case. At the same time, financial measures alone are not enough to assess the performance of not-for-profit organizations. Due to its objective of public service, measurement of appropriate non-financial metrics are equally important. The reasons are:

(i) **Benefits cannot be quantified:** Cure Hospital essentially provides public healthcare service to the economically weaker sections of the society. Due to political, legal, and social reasons, not-for-profit organizations like Cure Hospital cannot be shut down merely for not being economically / financially viable. Therefore, financial measures are less relevant. Due to its non-financial objective, appropriate non-financial measures become more important. For example, the benefits of saving lives cannot be quantified in financial terms.

(ii) **Benefits may accrue over long term:** The expenditure incurred in one year may yield benefits over several years. For example, the investment in an Intensive Care Unit (ICU) facility may accrue of multiple years. Neonatal care unit have been given financial and technical support from WHO which will give long term benefits to hospital.

(iii) **Measurement of utilization of funds and expenditure:** In the case of Cure Hospitals, many hospital services are free, allocation of capacity is aimed at providing free service to the BPL section of the society, medicines

are provided at discounted rates. Therefore, Cure Hospital does not have a substantial revenue stream to earn from its patients. It gets a fixed budget allocation from the State Government, while ADCO Hospital allocates these funds for various investments and expenditures. *The assessment whether the spending have been appropriate is a key challenge.* Defining cost per unit would be subjective since it could be cost of patients arriving at the hospital or cost of patients successfully treated at the hospital. Either figure could be tweaked to make it seem that the objectives are being met. The management may resort to rampant spending simply to meet the expenditure targets. Therefore, non-financial measure need to be put in place help stakeholders scrutinize whether the objectives for which funds have been given are being met.

(iv) **Multiple objectives:** Not-for-profit organizations have multiple objectives. It may be unclear which are the most important. Cure Hospital aims at providing high quality treatment to its patients while also developing innovative ways to deliver treatment to its patients. Both objectives are equally important and inter-related. Non-financial measures provide better information about how each of these objectives have been met.

The benefits of organizations like Cure Hospital are non-financial in nature. Except for providing fiduciary information to the stakeholders, all other objectives of Cure Hospital can be measure only using non-financial measures.

(b) Value for money for Cure Hospital would comprise of the 3Es: Economy, Efficiency and Effectiveness.

(i) Economy: Has the desired output (and quality of service) been achieved at the lowest cost?
The medical resource at Cure Hospital in terms of doctors is 80, higher than the national average of 76 at other centers. Doctor's salaries would be a significant expenditure for Cure Hospital. The average doctor's salary at Cure Hospital (including overtime) is ₹120,000 per month, this is within the budget figure as pointed out by Doctor A. The salary is lower than the national average at other PPP run hospitals, where doctors earn ₹160,000 per month. Therefore, *economy of money is being achieved at Cure Hospital*.

The relatively lower levels of salary could be due to differences in levels of experience or that the doctors at Cure Hospital work overtime without getting paid (as pointed out by Doctor B). This may be one of the reasons why staff satisfaction is only 16% compared to 86% in other centers.

(ii) Efficiency : Has maximum output been achieved with the minimum resources?

Treating patients is the key objective of Cure Hospitals, while doctors are the main resource to deliver it. The number of patients treated per year is a good measure of efficiency achieved.

Cure Hospital treats 84,572 patients (in house patient 8,360 + outpatient 76,212) while the national average at other centers is only 69,687 (in house patient 6,369 + outpatient 63,318). Cure Hospital has 80 doctors as compared to 76 national average. Therefore, each doctor at Cure Hospital treats 1,057 patients (84,572 patients/ 80 doctors) as compared to 917 patients (69,687 patients / 67 doctors) at other centers. *Resource utilization of its pool of doctors is higher in Cure Hospital.*

Doctor C mentions that there is not enough funding to hire more doctors and para-medic staff. Therefore, there is a constraint on the limited resources of doctors and support staff. This might be the reason, why each doctor at Cure Hospital works longer than colleagues at other centers.

Therefore, while efficiency in terms of number of patients treated by each doctor is high, there are other *hidden costs* that need to be taken into account. Few such costs could be low employee morale, higher waiting time of patients to receive treatment. This impacts the effectiveness of service provided.

(iii) Effectiveness: Has Cure Hospital achieved its mission or objective?

Cure Hospital has the objective of providing high quality medical service to its patients. Better quality of treatment would ensure that re-admission for treatment of the same ailment within a short span of time would be minimal. Number of such re-admitted patients in much higher at 627 at Cure Hospital as compared to 128 at other centers. Assuming all such re-admissions to be in-house patients, this return of patients for medical care for the same ailment within a short span of time is 7.50% compared to the national average of 2.01%.

Prompt medical treatment can also be questioned since the waiting time of patients to receive treatment has increased from 2 hours 20 minutes to 3 hours.

Senior Doctor K points out the time spent on delivering innovative care to patients may be limited due to financial constraints and overwork staff.

All this would have resulted in dissatisfaction among patients, whose survey indicates a score of 6 against a national average of 9. This shows that *objective of Cure Hospital is not being met effectively*.

To summarize, Cure Hospital is achieving economy by maintaining lower salaries for doctors. Out-reach to patients is also high as compared to national average. However, due to limited availability of resources, doctors and staff are overworked. While it does well on the efficiency aspect, it comes with a hidden cost in terms of dissatisfaction among patients and employees and low quality of medical care. Therefore, medical treatment is not effective, which is an important aspect in the value for money framework.

(c) Proposal to introduce nominal fee for out-patient treatment given to poor people and remove subsidized rate of CT scan and MRI for other patients.

Cure Hospital is a not-for-profit organization that aims at providing quality health care to the economically weaker sections of the society. It gets its primary funding from the State Government. It does not generate and is not aimed at generating substantial revenue from its patients. The CEO has proposed to introduce nominal fee for out-patient treatment given to poor people and remove subsidized rate of CT scan and MRI for other patients. However, this would not help Cure Hospital achieve its objective.

The given problem seems to suggest severe constraint in the resources available to meet its objectives thus impacting effectiveness of treatment. Each doctor treats 1,057 patients in a month as compared to the national average of 917 in a month. Number of patients, especially the out-patients is much more than

national average. Overworked doctors combined with limited staff resources is the main hurdle that Cure Hospital faces in effectively achieving its objectives.

Cure Hospital is a not-for-profit organization. Therefore, generating nominal fees to achieve its objectives would not help its purpose. Instead, it can apply for higher budget allocation from the government. This can help it procure good quality resources such as experienced doctors by paying them higher salaries including overtime. Better qualified doctors can help provide not just better treatment but also innovative ways of treatment to patients. Improved / enhanced facilities could reduce the waiting time for medical care, enabling prompt medical service.

Improved service would result in better treatment, lowering the cases for re-admissions for same ailment within a short span of time. This improves the effectiveness of medical care provided at Cure Hospital. Better service would improve patient satisfaction. Quality medical care would provide a better case for Cure Hospital to sustain its operations in the long- run. The State Government may also more favourably consider any justifiable future budgetary increments.

Overall, the management of the hospital seems to be indifferent to the opinions and needs of the staff. The CEO's decision has a very short term outlook that does not co-relate with the organization's objectives. By trying to off-set a limited revenue stream to achieve its objectives shows that the management's style of working needs improvement.

2. Pixel Limited is a toy manufacturing company. It sells toys through its own retail outlets. It purchases materials needed to manufacture toys from a number of different suppliers. Recently, due to the entry of few reputed foreign brands in the toy market and particularly in the segment in which Pixel Ltd. is doing business, it is facing a threat to operate profitably.

Each toy requires 4 kg. of materials at ₹ 19 per kg. and 5% of all materials supplied by the suppliers are found to be substandard. Labour hour requirement for each toy is 0.4 hour at ₹ 120 per hour.

Market research has determined that the selling price will be ₹ 240 per toy. The company requires a profit margin of 15% of the selling price. Expected demand for toy in the coming year will be 50,000 toys. Sales and variable overhead per unit for the four quarters of the year will be as follows:

Particulars	**Q1**	**Q2**	**Q3 (Festive season)**	**Q4 (Festive season)**
Sales (units)	7,500	9,000	15,500	18,000
Variable overhead per unit (₹)	22	22	24	25

Total fixed overheads are expected to be ₹ 6,25,000 for each quarter.

The production manager has decided to produce 12,500 units in each quarter. Inventory holding costs will be ₹ 18 per unit of average inventory per quarter. Inventory holding costs are not included in above.

Normal production capacity per quarter is 15,000 toys. The company can produce further up to 6,000 units per quarter by resorting to overtime working. Overtime wages will be at 150% of normal wage rate.
Assume zero opening inventory.

Required :

(a) (i) Calculate the cost gap that exists between the total cost per toy as per the production plan and the target cost per toy. [9 Marks]

(ii) Discuss how just-in-time purchasing and just-in-time production will remove the cost gap calculated in (i) above. Show calculations in support of your answer. [7 Marks]

(b) Explain, how implementation of JIT production method can be a major source of competitive advantage and success of the company. [4 Marks]

Answer 2 :

(a) (i) :

Calculation of Target Cost per toy :

= Selling Price - Profit

= ₹ 240 - 15% of sales price = ₹ 204

Calculation of cost as per Present Production Plan :

At present, production manager has decided to produce 12,500 units in each quarter, irrespective of sales. This production is within normal capacity of 15,000 toys per quarter. Hence, no overtimes wages will be incurred. However, we will have to incur inventory holding cost on average inventory.

Inventory Holding Cost :

Particulars	Q1	Q2	Q3	Q4	Total
Opening stock (Units)	0	5,000	8,500	5,500	
Add : Production (units)	12,500	12,500	12,500	12,500	50,000
Less : Sales (units)	(7,500)	(9,000)	(15,500)	(18,000)	50,000
∴ Closing Stock (units)	5,000	8,500	5,500	0	
∴ Average Stock (units)	2,500	6,750	7,000	2,750	
Inventory holding cost (₹) @ ₹ 18 per unit	45,000	1,21,500	1,26,000	49,500	3,42,000

Calculation of cost of production for 50,000 units :

Particulars	Per Unit (₹)	Total (₹)
Cost of Raw Material [4 kg. @ ₹ 19 per kg.] x 100/95	80	40,00,000
Labour cost [0.4 hour @ ₹ 120 per hour]	48	24,00,000
Variable Overheads [(22 x 12,500 units) + (22 x 12,500) + (24 x 12,500 units) + (25 x 12,500 units)]		11,62,500
Fixed Overheads [6,25,000 per quarter x 4 quarters]		25,00,000
Inventory holding cost [as per above working]		3,42,000
∴ Total Cost		1,04,04,500
∴ Total Cost per unit [1,04,04,500 / 50,000 units]	208.09	
∴ Cost gap per toy [208.09 - 204]	4.09	

(a) (ii) :

Calculation of cost as per JIT system :

Under JIT system, we will produce only as much as we can sell. Similarly, we will purchase the raw material only as much required for production. Under JIT, we won't carry any stock of finished goods, hence there will be no inventory holding cost. However, we will have to incur overtime wages beyond normal capacity of 15,000 toys per quarter.

Under JIT, Sales Qty. = Production Qty. for each quarter.

Calculation of cost of production for 50,000 units :

Particulars	Per Unit (₹)	Total (₹)
Cost of Raw Material [4 kg. @ ₹ 19 per kg.] x 100/95	80	40,00,000
Labour cost [0.4 hour @ ₹ 120 per hour]	48	24,00,000
Overtime Premium @ 50% of normal wages : Q3 : [15,500 - 15,000 units] x ₹ 24 = 12,000 Q4 : [18,000 - 15,000 units] x ₹ 24 = 72,000		84,000
Variable Overheads [(22 x 7,500 units) + (22 x 9,000) + (24 x 15,500 units) + (25 x 18,000 units)]		11,85,000
Fixed Overheads [6,25,000 per quarter x 4 quarters]		25,00,000
∴ Total Cost		1,01,69,000
∴ Total Cost per unit [1,01,69,000 / 50,000 units]	203.38	
Note : The revised cost is below the target cost of ₹ 204 per toy.		

Alternate view of ICAI :

ICAI answer has assumed that under JIT system, there will be no substandard material from suppliers. Which means, our suppliers will supply best quality raw material and hence the adjustment of 5% substandard material will not be required. In such case, material cost per unit shall be = (4 kg. @ ₹ 19 per kg) = ₹ 76 per unit of output. This will result in to a further savings of (₹ 4 per unit x 50,000 units) = ₹ 2,00,000 per annum. Thus the revised total production cost shall be (1,01,69,000 - 2,00,000) = ₹ 99,69,000 per annum.

As the question is completely silent about such saving under JIT system, I have preferred to calculate it by ignoring such savings. ICAI has considered both the views as correct.

(b) How implementation of JIT production method can be a major source of competitive advantage and success of the company :

JIT system has five main features as follows :

- Organise production in manufacturing cells, a grouping of all the different types of equipment used to make a given product. Materials move from one machine to another where various operations are performed in sequence. Material handling cost are reduced.
- Hire and retain workers who are multi-skilled so that they are capable of performing a variety of operations, including repairs and maintenance tasks. Thus, labour idle time gets reduced.
- Apply TQM to eliminate defects. As, there are tight link stages in the production line, and minimum inventories at each stage, defect arising in one stage can hamper the other stages. JIT creates urgency for eliminating defects as quickly as possible.
- Place emphasis on reducing set-up time which makes production in smaller batches economical and reducing inventory levels. Thus, company can respond to customer demand faster.
- Carefully selected suppliers capable of delivering high quality materials in a timely manner directly at the shop floor, reducing the material receipt time.

This will have the positive impact on the business like :

- Meeting customer demand in a timely manner
- Providing high quality products and
- Providing products at the lowest possible total cost.

3. AKG Limited has three autonomous divisions. The divisions are evaluated on the basis of ROI, with year end bonus given to divisional managers who have the highest ROI. Operating results of Division II for the last year are given below :

	₹
Sales	2,10,00,000
Less : Variable Expenses	1,26,00,000
Contribution margin	84,00,000
Less : Fixed Expenses	67,20,000
Net Operating Income	16,80,000
Divisional operating assets	52,50,000

The company's overall ROI for the last year was 18% (considering all divisions). Division II has an opportunity to add a new product line that would require an investment of ₹ 30,00,000. Other details of the new product line are as follows :

Sales	₹ 90,00,000 per annum
Variable Expenses	65% of sales
Fixed Expenses	₹ 25,20,000 per annum
Life cycle of the product line	5 years

Though Division II is performing well, but many a times, the customers complained that they had to wait for long after placing the orders. The company is interested in cutting the amount of time between when a customer places an order and when the order is completed. For the last year, the following data were reported in respect of Division II.

Inspection time	= 0.5 days per batch
Process time	= 2.8 days per batch
Wait time	= 16.0 days per batch
Queue time	= 4.0 days per batch
Move time	= 0.7 days per batch

In addition to financial performance measures, the company wishes to introduce a variety of non-financial performance measures.

The company has set aggressive targets in both sales growth and ROI for the coming year. The company's strategy for achieving these goals includes a campaign aimed at building brand recognition, customer retention, improvement in product quality, on time delivery to customers, expansion of eco-friendly product line and introduction of limited edition items.

Required :

(a) (i) Calculate last year's ROI of Division II [1 Mark]

(ii) Discuss whether the manager of Division II would accept or reject the new product line, if he takes his decision based solely on divisional ROI. [2 Marks]

(iii) Advise how residual income approach can be used as an alternative financial measure for evaluation of managerial performance in the best interest of the company. [2 Marks]

(iv) Calculate Manufacturing Cycle Efficiency (MCE) and interpret the result. [3 Marks]

(v) State what percentage of the production time is spent in non-value added activities. [1 Mark]

(vi) Calculate the delivery cycle time. [1 Mark]

(vii) Calculate the new MCE if by using Lean Production all queue time can be eliminated. [2 Marks]

(b) Based on the above information and using a Strategy Map tabulate two objectives and two measures for each perspective across the four dimensions of a balanced scorecard in the following format : [8 Marks]

Perspective	Strategic Objective	Measure

Answer 3 :

(a) (i) Calculation of last year ROI of Division II

= Controllable Profit/ Controllable Net Asset

= ₹ 16,80,000 / ₹ 52,50,000

= **32%**

(ii) **Calculation of ROI of New Product Line**

Particulars	**Amount (₹)**
Sales	90,00,000
Less: Variable Cost	58,50,000
Controllable Contribution	31,50,000
Less: Fixed Cost	25,20,000
Controllable Profit	6,30,000
Investment Available	30,00,000
Return on the Proposed Line (ROI)	21%

The manager of Division II would be unwilling to invest the additional ₹30 lacs because this would decrease the Division II's ROI from 32% to 28%.

[(₹16,80,000 + ₹6,30,000) / (₹52,50,000 + ₹30,00,000)]

(iii) Generally, a manager who is evaluated based on ROI will reject any project whose rate of return is below the Division's current ROI even if the rate of return of the project is above the company's minimum required rate of return. In contrast, managers who are evaluated using residual income will pursue any project whose rate of return is above the minimum required rate of return, because it will increase their residual income. So, in the best interest of the company as a whole, residual income approach can be used for evaluation of managerial performance.

For the investment decision for Divisions II, the residual income calculations are as follows:

Proposed Investment	₹ 30,00,000
Controllable Profit	₹ 6,30,000
Less : Cost of Capital (18% x 30,00,000)	₹ 5,40,000
Residual Income(RI)	90,000

Advise : Residual Income is more likely to make correct investment decisions, and so is probably a 'safer' basis than ROI on which to measure performance.

(iv) **Manufacturing Cycle Efficiency (MCE)**

$$= \frac{\text{Processing Time}}{\text{Inspection Time + Process Time + Queue Time + Move Time + Wait Time}}$$

$$= \frac{2.8 \text{ days}}{0.5 \text{ days} + 2.8 \text{ days} + 4.0 \text{ days} + 0.7 \text{ days} + 16.0 \text{ days}}$$

= 11.67%

Interpretation : In AKG, the MCE is 11.67%, which means that 88.33% of the time a unit is in process is spent on the activities that do not add value to the product. Monitoring the MCE helps companies to reduce non-value added activities and thus get products into the hands of customers more quickly and at a lower cost.

(v) **Percentage of Time Spent on Non-Value Added Activities**

= 100% - 11.67%

= 88.33%

(vi) **Delivery Cycle Time**

i.e. total time required to give delivery to the customer

= 0.5 days + 2.8 days + 4.0 days + 0.7 days + 16 days

= 24 days

(vii) **Revised MCE**

$$= \frac{2.8 \text{ days}}{0.5 \text{ days} + 2.8 \text{ days} + 0 \text{ days} + 0.7 \text{ days} + 16 \text{ days}}$$

= 14%

Alternate view on Revised MCE

If we assume that wait time of 16 days is also removed by lean production system, then the calculation shall be as follows :

$$= \frac{2.8 \text{ days}}{0.5 \text{ days} + 2.8 \text{ days} + 0.7 \text{ days}}$$

= 70%

(b) Balanced Score Card :

Perspective	Strategic Objective	Measure
Financial	▪ Improve ROI ▪ Increase Sales	▪ % increase in ROI ▪ % increase in sales
Customer Perspective	▪ Improve brand recognition ▪ Customer retention	▪ % of target audience who recognize brand ▪ % of suggestions/ complaints responded ▪ % increase in repeat customers/ Number of repeat customers
Internal Perspective	▪ Improve in product quality ▪ Improve on time delivery to customers ▪ Reduction in time spent in non-value added activities	▪ % reduction in defect rate ▪ % of orders on time ▪ % increase in MCE
Learning & Innovation	▪ Expansionof eco-friendly product line ▪ Introduction of limited edition items	▪ No of eco-friendly products developed. ▪ No of limited editions introduced.

Note : Any logically correct answer is valid in the above case.

4. (a) A chemical company produces two chemicals SX and ZX. Environmental activities and costs associated with the two chemicals are as follows :

	SX	ZX
Unit produced (kg.)	6,00,000	15,00,000
Packing Materials (kg.)	80,000	40,000
Energy Usage (KWH)	60,000	30,000
Toxin releases (Pounds into air)	2,00,000	40,000
Pollution control machine hours	32,000	8,000
Cost of environmental activities :		
Packing material Costs		₹ 3,60,000
Energy Costs		₹ 96,000
Fines for release of toxins into air		₹ 48,000
Operating costs of pollution control equipments		₹ 1,12,000

Required :

Calculate the environmental cost per kilogram for each chemical produced by the company. [5 Marks]

OR

The triple bottom line recognises that a company's performance should not only be viewed in terms of its ability to generate economic profits for its owners, but also by its impact on people and the planet for its long term economic and social viability. XYZ Limited has recently undertaken initiatives towards sustainability as below :

(i) Reduced the amount of plastic usage in the peanut butter jars.

(ii) Provided financial support to hospital run by local authority in the vicinity of the factory.

(iii) Constructed solar powered warehouse.

(iv) Generated profit for the company's shareholders.

(v) Started child care unit for the benefit of women employees as well as for the neighbourhood community.

Required :

Identify whether this initiative would primarily impact people, planet or profit. [5 Marks]

(b) The President of Automation Limited, a 150 persons engineering company, decided it was time to fire the company's biggest client. Although the client provided close to 60% of the company's annual revenue, Automation Limited decided that dropping this client was necessary. The client was profitable.

The President of Automation Limited stated "We cannot be a great place to work without employees, and this client was bullying my employees. Its demands for turnaround were impossible to meet even with people working seven days a week. No client is worth losing my valued employees".

The initial impact on revenues was significant. However, Automation Limited was able to cut costs and obtain new customers to fill the void. Moreover, the dropped client later gave Automation Limited two projects on more equitable terms.

Required :

(i) Discuss the reasons behind dropping of a profitable client by Automation Limited. [2 Marks]

(ii) State three qualitative factors that management should consider in outsourcing and make or buy decision. [3 Marks]

(c) APC Ltd. has two divisions - Division X and Division Y with full profit responsibility. Division X produces components 'Gex' which is supplied to both division Y and external customers.

Division Y produces a product called 'Gextin' which incorporates component 'Gex'. For one unit of 'Gextin' two units of component 'Gex' and other materials are used.

Till date, Division Y has always bought component 'Gex' from division X at ₹ 50 per unit since the lowest price at which the component 'Gex' could have been bought by Division Y was ₹ 52 per unit.

Division X charges the same price for component 'Gex' to both division Y and external customers. However, it does not incur selling and distribution costs when transferring internally.

Division Y has received a proposal from a new supplier who has offered to supply 'Gex' for ₹ 47 per unit at least for the next three years.

Manager of Division Y requests the manager of Division X to supply component 'Gex' at or below ₹ 47 per unit. Manager of Division X is not ready to reduce the transfer price since the divisional performance evaluation is done based on profit margin ratio of the divisions.

The following additional information is made available to you:

	Component 'Gex'	**Product 'Gextin'**
	₹	**₹**
Selling Price per unit	50	180
Less: Variable Costs		
Direct Materials :		
Component 'Gex'	-	100
Other materials	12	22
Direct Labour	16	13
Manufacturing Overhead	2	5
Selling and Distribution Costs	4	2
Contribution per unit	16	38
Annual fixed costs	₹ 40,00,000	₹ 20,00,000
Annual external demand (units)	3,00,000	1,20,000
Capacity of plant (units)	5,00,000	1,50,000

Required :

(i) Calculate the present profit of each division and the company as a whole. [2 Marks]

(ii) Analyse the impact on the total annual profits of each division and the company as a whole if Division Y accepts the offer of the new supplier. [4 Marks]

(iii) In the changed scenario, discuss why the top management should intervene and advise a suitable transfer price for component 'Gex' for resolving transfer pricing conflict which promotes goal congruence through efficient performance of the concerned division. [4 Marks]

Answer 4(a) :

Environment costs can be allocated to Chemicals SX and ZX using Activity Based Costing System as follows :

Particulars	Total Cost (₹)	Cost Drivers	SX	ZX
Packing Material Costs	3,60,000	Packing Materials [80 : 40]	2,40,000	1,20,000
Energy Cost	96,000	Energy Usage (KWH) [60 : 30]	64,000	32,000
Fines for Release of Toxins into Air	48,000	Toxins Released [20 : 4]	40,000	8,000
Operating Costs of Pollution Control Equipment	1,12,000	Pollution Control Machine Hours [32 : 8]	89,600	22,400
Total Cost	6,16,000		4,33,600	1,82,400
Units Produced (kg.)			6,00,000	15,00,000
Environment Cost per kg. of output			**0.7227**	**0.1216**

OR

Identification of initiatives undertaken by XYZ Ltd. into categories it would impact based on the Triple Bottom Line Model – People, Planet or Profit.

Reduced the amount of plastic usage in peanut butter jars.	Planet
Provided financial support to hospital run by local authority in the vicinity of the factory	People
Constructed solar powered warehouse	Planet
Generated profit for the company's shareholders	Profit
Started child care unit for the benefit of women employees as well as for the neighboring community	People

Answer 4(b) :

Decision Making – Automation Ltd.

(i) With increasing competition, dynamic market changes, changing needs of customers, non-financial and ethical considerations have gained relevance in the decision- making process. A company may face the dilemma of meeting customers' needs while protecting employees' rights. While there are no clear-cut parameters to measure the impact of such decisions, they have a long-term impact on the company's operations that ensures profitability and sustainability of an organization.

In the given scenario, a customer who contributes close to 60% of Automation Ltd.'s revenue has been making turnaround demands that are unreasonable for the company employees to meet. Automation Ltd. has to decide whether to continue doing business with the customer based on the current terms or protecting the work environment of its employees. In the current scenario, it is in Automation's long term interests to protect its employees' rights (a non-financial consideration).

Keeping this approach in mind, Automation Ltd. decided to terminate business with the profitable client. While this had a significant impact on revenues in the short term, in the long run Automation Ltd. was able to get business from new clients. Also, realizing the value of service provided, the dropped client came back with projects on equitable terms. Therefore, even though it did not make financial sense in the short run, decisions based on non-financial metrics played an important role in ensuring Automation Ltd.'s long term sustainability.

(ii) Qualitative factors to consider while making the outsourcing and make or buy decisions:

(a) Quality of goods produced outside v/s in-house production of the component. Outsourcing or buying a component from the external market, should not impact the overall quality of the product. Therefore, any component critical for a product would generally not be outsourced unless its supplier gives quality assurance.

(b) Reliability of suppliers in the outsourcing arrangement. Assurance must be given by the supplier in terms of both quality and timely delivery of components for the given price. Also, there must be a sufficient pool of suppliers from whom the company can buy the product. If one supplier closes shop, there must be alternate suppliers available.

(c) Availability of skilled labour and infrastructure to make the component in-house. If not available, then the component may have to be bought from the external market.

(d) Regularity of demand for the product – If made in-house, seasonal demand for a product may result in the risk of holding high inventories (including that of raw materials) or making high capital investments that will prove unproductive during off-season. Therefore, outsourcing or buying from external market may be more viable when the demand for the final product is seasonal.

(e) Risk of technological obsolescence for the component – when the risk is higher company may favour outsourcing.

(f) Confidentiality of process or patent of process – Confidential processes or critical components may not be outsourced.

(g) The shutting down of company's manufacturing facility might have a negative impact on the morale of remaining employees.

Answer 4(c) : APC Ltd.

Key Information :

Variable cost per unit of 'Gex' for outside sale = 12 + 16 + 2 + 4 = ₹ 34

Variable cost per unit of 'Gex' for internal transfer = 12 + 16 + 2 = ₹ 30

Variable cost per unit of 'Gextin' with internal transfer @ ₹ 50 per unit of 'Gex'

= (50 x 2) + 22 + 13 + 5 + 2 = ₹ 142

Variable cost per unit of 'Gextin' with outside purchase @ ₹ 47 per unit of 'Gex'

= (47 x 2) + 22 + 13 + 5 + 2 = ₹ 136

Division Y can sell only 1,20,000 units of 'Gextin' p.a. in the external market. For which, it will require (1,20,000 x 2) = 2,40,000 units of 'Gex' as input.

In Division X, the total plant capacity is to produce 5,00,000 units of 'Gex'. Out of which, 2,40,000 is assumed to be used for internal supply to Division Y and remaining capacity of 2,60,000 units is used to satisfy the external demand.

(i) Calculation of present profit with internal transfer of 'Gex' :

Particulars	₹	₹
(a) Profit of Division X :		
Contribution from Internal Transfer [2,40,000 units x (50 - 30)]	48,00,000	
Contribution from External Sale [2,60,000 units x (50 - 34)]	41,60,000	
Less : Annual fixed cost	(40,00,000)	49,60,000
(b) Profit of Division Y :		
Contribution from External Sale [1,20,000 units x (180 - 142)]	45,60,000	
Less : Annual fixed cost	(20,00,000)	25,60,000
(c) Total profit of the company [a + b]		75,20,000

(ii) Calculation of profit if Division Y purchases 'Gex' from new supplier :

Particulars	₹	₹
(a) Profit of Division X :		
Contribution from External Sale [3,00,000 units x (50 - 34)]	48,00,000	
Less : Annual fixed cost	(40,00,000)	8,00,000
(b) Profit of Division Y :		
Contribution from External Sale [1,20,000 units x (180 - 136)]	52,80,000	
Less : Annual fixed cost	(20,00,000)	32,80,000
(c) Total profit of the company [a + b]		40,80,000

Comment : As can be observed from the above two calculations, that the overall profit of the company has been reduced by ₹ 34,40,000 due to outside purchase. Hence, outside purchase of 'Gex' is not advisable for the company.

(iii) Intervention of Top Management :

Top management must intervene and resolve the transfer pricing conflict to promote goal congruence. Else, the company will suffer a loss of ₹ 34,40,000.

The minimum transfer price for Division X shall be

= Marginal cost + Opportunity cost (i.e. contribution lost on external sale)

= ₹ 30 + ₹ 16 = ₹ 46 per unit

The maximum price which Division Y can pay is the lower of the following two -

(a) Net incremental revenue

= Sales price - Variable cost excluding internal transfer

= 180 - (22 + 13 + 5 + 2) = ₹ 138 (for 2 units of Gex)

= ₹ 138 / 2 = ₹ 69 per unit of Gex

(b) Outside purchase price

= ₹ 47 per unit of Gex

The lower of the above two is ₹ 47 per unit of Gex.

The top management can easily fix a transfer price between ₹ 46 to ₹ 47 per unit.
This will also ensure the full utilisation of the plant capacity of Division X and will improve overall profit of the company.

5. (a) APZ Company Ltd. manufactures spare parts and can be called "high volume based" manufacturing environment. The company is using the system of Total Productive Maintenance for maintaining and improving the integrity of manufacturing process. There are several different automated manufacturing machines located in the plant, through which manufacturing of spare parts are done and supplied to cater the demand in the market.

A 12 hour shift is scheduled to product a spare part in APZ Company Ltd. as shown in the schedule below. The shift has three 15 minute breaks a 10 minute clean up period.

Production Schedule for Automated Machine A 10 :
Cycle : 10 (seconds),
Spare parts Manufactured : 3360,
Scrap : 75,
Unplanned Downtime : 36 minutes

Required :

(i) Calculate OEE (Overall Equipment Effectiveness) and comment on it. [6 Marks]

(ii) The management of company has decided to ensure that things are done right the first time and that the defects and waste are eliminated from operations. Thus they are planning to implement Total Quality Management (TQM) also.

Summarize the connection between Total Quality Management (TQM) and Total Productive Maintenance (TPM). [4 Marks]

(b) SPS Limited uses activity based costing to allocate variable manufacturing overhead costs to products. The company identified three activities with the following information for last quarter :

Activity	Standard Rate	Standard Quantity per unit produced	Actual Costs	Actual Quantity
Indirect Materials	₹ 20 per kilogram	0.5 kilogram per unit	₹ 9,40,000	48,000 kilogram
Product Testing	₹ 3 per test minute	10 minutes per unit	₹ 22,50,000	7,40,000 test minutes
Energy	₹ 0.20 per minute of machine time	4 minutes of machine time per unit	₹ 70,000	3,60,000 minutes of machine time

The company produced 80,000 units in the last quarter. Company policy is to investigate all variances above 5% of the flexible budget amount for each activity.

Required :

(i) Calculate variable overhead expenditure variance and variable overhead efficiency variance for each of the activities using activity based costing. Clearly indicate each variance as favourable or unfavourable / adverse. [6 Marks]

(ii) Interpret the results of variable overhead efficiency variance as calculated in (i) above in respect of indirect materials and product testing activity. [2 Marks]

(iii) Identify the variances that should be investigated according to company policy. Show calculations to support your answer. [2 Marks]

Answer 5(a) :

Key Calculations :

Particulars		Minutes
Total time available in a shift of 12 hours [12 hours x 60 minutes]		720
Less : Down time / Idle time : Breaks (15 min x 3) Clean up period Unplanned downtime	 45 10 36	 91
∴ Effective time actually worked		629
Standard time allowed for actual output [3360 units x 10 second cycle] / 60 seconds		560

(i) Calculation of OEE :

Availability Ratio :

= Effective time available per shift x 100
Gross time per shift

= [629 min.] x 100
[720 min.]

= 87.36%

Performance Ratio (i.e. Efficiency Ratio) :

= Standard time required for actual output x 100
Actual time taken for actual output

= (560 minutes) x 100
(629 minutes)

= 89.03%

Quality Ratio :

= Number of units accepted x 100
No. of units produced

= (3360 - 75) units x 100
3360 units

= 97.77%

OEE Ratio :

OEE % = Availability × Performance × Quality
= 87.36% x 89.03% x 97.77%
= 76.04%

Comments :

Since OEE of APZ Co. Ltd. is lesser than 85% i.e. World Class Performance Level, company is advised to improve its each ratio i.e. availability ratio, performance ratio and quality ratio. It can be done by collecting information related to all downtime and losses on machines, analyzing such information through graphs and charts, making improvement decisions thereon like autonomous maintenance, preventive maintenance, reduction in set up time etc. and implementing the same.

(ii) Connection between TQM and TPM :

The connection between TQM and TPM is summarized below:

- TQM and TPM make company more competitive by reducing costs, improving customer satisfactions and slashing lead times.
- Involvement of the workers into all phases of TQM and TPM is necessary.
- Both processes need fundamental training and education of participants.
- TPM and TQM take long time to notice sustained tangible benefits.
- Commitment from top managements is necessary for successful implementation.

Answer 5(b) :

Student Note :

This question is related to standard costing with ABC. We have these type of questions in your Version 3, Volume II notes on page 239 & 240. You have to slightly modify the formulae of Variable Overhead Expenditure & Efficiency Variance and then use it here.

Original Formulae :

Variable OH Expenditure Variance = (SRR/hr. x Actual hours) - Actual OH

Variable OH Efficiency Variance = SRR/hr. x (Standard Hours - Actual hours)

(i) Calculation of Variances :

For Indirect Material -

Variable OH Expenditure Variance = (SRR/kg. x Actual Qty.) - Actual OH
= (20 x 48,000 kg.) - 9,40,000
= 9,60,000 - 9,40,000 = ₹ 20,000 (F)

Variable OH Efficiency Variance = SRR/kg. x (Standard Qty. - Actual Qty.)
= 20 x [(0.5 x 80,000) - 48,000 kg.]
= 20 x (40,000 - 48,000) = ₹ 1,60,000 (A)

For Product Testing -

Variable OH Expenditure Variance = (SRR/Min. x Actual Min.) - Actual OH
= (3 x 7,40,000 min.) - 22,50,000
= 22,20,000 - 22,50,000 = ₹ 30,000 (A)

Variable OH Efficiency Variance = SRR/min. x (Standard Min. - Actual Min.)
= 3 x [(10 x 80,000) - 7,40,000 min.]
= 3 x (8,00,000 - 7,40,000) = ₹ 1,80,000 (F)

For Energy -

Variable OH Expenditure Variance = (SRR/Min. x Actual Min.) - Actual OH
= (0.2 x 3,60,000 min.) - 70,000
= 72,000 - 70,000 = ₹ 2,000 (F)

Variable OH Efficiency Variance = SRR/min. x (Standard Min. - Actual Min.)
= 0.20 x [(4 x 80,000) - 3,60,000 min.]
= 0.20 x (3,20,000 - 3,60,000) = ₹ 8,000 (A)

(ii) Interpretation of Results :

Indirect Materials

SPS actually spent 48,000 kg. or 8,000 kg. more than the standard allowed. At a predetermined rate of ₹ 20 per kg., efficiency variance is 1,60,000 (A). Since actual quantity were higher than the standard, the variance is unfavorable. This adverse variance, could have been caused by the inferior quality, result of carelessness handling of materials by production workers or could as a result of change in methods of production, product specifications or the way in which quality of the product is checked or controlled.

Product Testing

Favorable efficiency variance amounting to ₹1,80,000 indicates that fewer testing minutes were expended during the quarter than the standard minutes required for the level of actual output. This may be due to employment of a higher skilled labor or improvement of skills of existing workforce through training and development leading to improved productivity etc.

(iii) Investigation of Variances :

Activity	Std. Cost Per unit (₹)	Flexible Budget i.e. Std. Cost of actual output (₹)	Actual cost (₹)	Actual Difference (₹)	Allowable Difference (₹)	Action
(1)	(2)	(3) = 2 x 80,000	(4)	(5) = 3 - 4	(6) = 5% x (3)	(7)
Indirect Material	10 [20 x 0.5]	8,00,000 [10 x 80,000]	9,40,000	1,40,000	40,000	Investigate
Product Testing	30 [3 x 10]	24,00,000 [30 x 80,000]	22,50,000	1,50,000	1,20,000	Investigate
Energy	0.80 [0.2 x 4]	64,000 [0.8 x 80,000]	70,000	6,000	3,200	Investigate

Note : If actual difference (i.e. column 5) is greater than the allowable 5% difference (i.e. column 6), then we have to investigate all the variances.

6. (a) SEZ Limited produces three products S, Q and L which use the same resources but in varying quantities. Product S uses one unit of component P which is purchased from outside suppliers at ₹ 120 per unit. Details of the three products are as follows :

Particulars	**S**	**Q**	**L**
Annual Demand (units)	9,000	5,700	7,800
Data Per Unit :	**₹**	**₹**	**₹**
Selling Price	310	275	224
Component P	120	-	-
Direct materials (₹ 8 per kg.)	24	32	24
Skilled labour (₹ 40 per hour)	20	60	40
Unskilled labour (₹ 24 per hour)	18	24	36
Variable Overhead (₹ 6 per machine hour)	18	24	24

Annual fixed costs are ₹ 15,00,000.
Maximum availability of skilled labour is 16,200 hours. Other resources are sufficient to meet the annual demand / sales.

Engineering division of the company came forward with a proposal to make the component 'P' in house with the following costs break up :

Direct materials (₹ 8 per kg.)	₹ 24
Skilled labour (₹ 40 per hour)	₹ 40
Unskilled labour (₹ 24 per hour)	₹ 8
Variable Overhead (₹ 6 per machine hour)	₹ 18
Total cost per unit	**₹ 90**

For in-house making of the component 'P' there will not be any change in the annual fixed costs of the company. The company can either buy component 'P' or make it in house.

Required :
Recommend the optimum production plan and profit for the year. Show calculation in support of your answer. [10 Marks]

(b) SW& Co. is a firm of Chartered Accountants having head office at Delhi and four branches in different parts of Northern region. They are providing wide range of services to their esteemed clients. Their core services include Taxation, Corporate Audits, Bank Audits, Management Audits and Project financing. The firm is preparing its budgets for the financial year 2019-2020.

The senior partners of the firm have stated that they would like to pay off the firm's loan taken from a public sector bank two years back for the renovation of their office premises this year and to have a positive cash reserve of ₹ 2,00,000 by the end of the year.

While comparing the actual cost with the budgeted data of last year, it was revealed that travelling costs were much higher than the budgeted costs. Fees receivable from some clients were also pending for more than three years thus distorting the expectations of cash budget.

Discuss the differences between feedforward control and feedback control using the above information about the cash budget of SW & Co. [10 Marks]

Answer 6(a) :

Approach : It is primarily a question based on key factor concept with make or buy decision. The key factor in this question is 'Skilled Labour Hours'. We need to calculate the contribution per skilled labour hour for Products S, Q & L. At the same time, we need to calculate savings per hour for component P, if we manufacture it. Then we have to decide the ranking and utilise our key resources based on such ranking.

(i) Statement of Contribution per hour and ranking :

Particulars	**S**	**Q**	**L**	**P**
(a) Variable Cost Per Unit :	₹	₹	₹	₹
Purchase price of component P	120	-	-	
Direct materials (₹ 8 per kg.)	24	32	24	24
Skilled labour (₹ 40 per hour)	20	60	40	40
Unskilled labour (₹ 24 per hour)	18	24	36	8
Variable Overhead (₹ 6 per machine hour)	18	24	24	18
Sub-total (a)	200	140	124	90
(b) Selling Price for Products S, Q, L and Purchase price for Component P	310	275	224	120
(c) Contribution or Savings per unit [b - a]	110	135	100	30
(d) Skilled labour hours per unit [Skilled labour cost / 40 per hour]	0.50	1.5	1.0	1.0
(e) Contribution or savings per hour [c / d]	220	90	100	30
(f) Ranking for production	I	III	II	IV

(ii) Optimum Production Plan as per ranking :

Particulars	**No. of units**	**Hours per unit**	**Total hours**	**Balance hours**
Total available skilled labour hours				16,200
Less : Used for max. demand of S	9,000	0.50	4,500	11,700
Less : Used for max. demand of L	7,800	1.00	7,800	3,900
Less : Balance hours used for Q	2,600	1.50	3,900	NIL

Note : In the above calculation, it may be noticed that we are not left with any time to produce component P. Hence, entire requirement of P is to be purchased from outside supplier.

(iii) Calculation of Profit for the year :

Particulars	**₹**
Contribution from :	
Product S : [9,000 units x 110 p.u.]	9,90,000
Product Q : [2,600 units x 135 p.u.]	3,51,000
Product L : [7,800 units x 100 p.u.]	7,80,000
Total contribution p.a.	21,21,000
Less : Annual Fixed cost	15,00,000
∴ Profit for the year	6,21,000

Answer 6(b) :

Feed forward control systems are the comparison of draft plans with the objectives of the company.

In the scenario provided the consultancy firm has a number of objectives, two of which are related to their cash flow. The first of these is to pay off the loan by the year end and the second is to have a positive cash reserve of ₹ 2,00,000 by the year end.

An initial draft of the cash budget will be produced based on the expected receipts and payments and other costs of the firm. Cash budgets to be prepared showing the cash inflows and outflows for each month so that the firm can identify its expected monthly cash balance. This can be compared with the company's objectives to see if their cash balance objectives are being achieved. It is this comparison that is the process of feed forward control.

It is also referred to as a preventive control. The rationale behind feed forward control is to foresee potential problems and take corrective action to ensure that the final output is as expected. Feed forward controls are desirable because they allow management to prevent problems rather than having to cure them later. Feed forward controls are costly to implement as it requires additional resources and investments.

Feedback control systems are the comparison of actual results against the budget that has been approved. Thus, in the context of the SW & Co., actual travelling costs comparison made against the budgeted costs and overdue fees receivables are also the process of feedback control.

As with any budget and actual comparison there may be an adverse or favorable variance. If this is significant then further analysis may be required to determine its cause. This comparison process is feedback control. It is also known as post action control. If any problem is identified after a process is complete, a corrective action is taken to rectify the problem. Feedback based system have the advantage of being simple and easy to implement.

Thus, initially the difference between feed forward control and feedback control systems is that feed forward occurs in the budget setting stage whereas feedback control occurs during the year. This means that feed forward identifies potential problems before they occur whereas feedback identifies problems after they have happened.

* * * * *

3 RTP - November 2019

Question 1 : [Case Study]

Ethical and Non-Financial Considerations

Nutty Bites produces many edible snacks that are very popular especially among children. Peanuts, Peanut oil are essential ingredients in many of its products. They are currently facing this ethical issue –

"Medical studies have indicated peanut allergic reactions are on the rise. The prevalence is more profound among children. Reactions can range from hives around the mouth to potentially life threatening reactions when exposed even to the slightest trace of peanuts. There is growing media campaign to force companies like Nutty Bites to make disclosure about the presence of peanut on its package labelling."

Nutty Bites is a mid-size company that has a growing market. Risk to peanut exposure can come not just from the presence of peanuts in its products. Some of its bought-in ingredients (raw material input) are cooked in peanut oil. There are risks of "cross-contamination" amongst products. Let us say, an equipment has been used to produce cookies that has peanuts. Next, the equipment is used, without being cleaned, to produce chips that does not have peanuts as an ingredient. Some portion of the peanuts / peanut oil could contaminate that specific batch of chips produced. Since labels of chips would not mention "peanuts" as an ingredient, it poses a potential risk of causing allergic reaction to a customer unaware of this contamination.

Management of Nutty Bites has called for a meeting to discuss this issue. "The issue need not be addressed at all. After-all Nutty Bites is doing nothing against the law" is the opinion of many members on the board of the company.

Required :

(i) EXPLAIN why Nutty Bites should attempt to address this issue.

(ii) STATE potential benefits that business can garner by addressing this issue.

(iii) RECOMMEND, with reasons, the avenues available to Nutty Bites to address this ethical issue.

(iv) EVALUATE the recommend solutions.

Answer 1 :

(i) Modern organizations have a moral duty of care to a wider range of stakeholders not just owners / investors in this case. It owes a duty of care to anybody who consumes its products. The presence of peanuts or peanut oil makes it a potential "health hazard" to some consumers. Food safety is a fiduciary duty that Nutty Bites owes to the society. Corporate Social Responsibility (CSR) is the duty an organization has towards a wider community.

(ii) Addressing this ethical issue will help Nutty Bites to become a morally responsible organization. The long-term benefits to its business could be as follows:

(a) Avoid bad publicity that could potentially damage its reputation and brand image.

(b) Avoid potential legal action for tort, committing a civil wrong.

(c) Operating environment within the business is more ethical, giving a sense of well-being to its employees.

(iii) Following could be some of the responses that Nutty Bites could take to address the issue:

(a) A clear warning on the ingredients box that the factory uses peanuts while manufacturing some of its products. This should be included even in products that do not contain peanuts, to avoid any harm due to risk of cross-contamination. Customers who suffer this allergy, would then be aware of the potential risk of consuming products of Nutty Bites. Protection from potential lawsuits counters any loss of business for Nutty Bites.

(b) Segregate areas to have separate processing lines for products with peanuts / peanut oil and those without it. If possible, have segregated staff for the two production lines in order to avoid the risk of cross-contamination. If this is not possible, staff have to be well trained on the risk of cross-contamination. Gloves need to be provided while handling material during production of food products. This should be changed each time staff handle production changes from “peanut variety” to the “non-peanut variety”.

(c) Equipment should be thoroughly cleaned while switching production from one variety to another. Fewer changeovers in the production cycle, that is producing products in larger batches, reduces the number of switches during production of different varieties of food products.

(d) Storage of peanut material should be well segregated and monitored to avoid contamination.

(e) If Nutty Bites has the resources, if could invest in pharma companies that are finding a medical solution to this problem. The food industry could benefit from research and development of treatments to address this life-threatening allergy. A break-through would address a societal problem, while also having a positive impact for growth of Nutty Bites.

(iv) Risk of product safety is an important issue that needs constant review. Review would be of the production process, storage, material handling as well as ingredient of purchased raw materials. The benefit of constant review is that Nutty Bites can immediately identify danger of contamination. For example, if a supplier of raw material changes the production of the ingredients to include peanut / peanut oil, then Nutty Bites can be immediately aware of the change due to its review process. In case of any future litigation, Nutty Bites could defend itself by proving that it had a robust review process in place.

On the other hand, constant review requires time and money, with an ever-present possibility of contamination. It is not feasible to ensure complete safety. Reviewers / quality inspectors could become negligent once the process is well established. This could lead to instances of contamination, even with a review process in place.

To conclude, Nutty Bites is morally responsible to spread awareness that some of its products may contain allergy causing peanuts/ peanut oil. It should streamline its storage and production process to avoid risk of cross-contamination.

Question 2 : [Case Study]

Outsourcing

Staywell Hotels was established 10 years ago as a budget hotel in the vicinity of Mumbai airport. It provides accommodation for cost-conscious travellers visiting the city for short stay lasting a day or two. Typically, a room would provide comfortable beds, high speed internet connection, air conditioning facility, coffee machine, fridge and free television service. Food service based on a limited menu is provided on the premises. It has few conference rooms that provide space for guests to hold business meetings. This saves them precious time otherwise wasted in travelling on congested city roads. The hotel provides free shuttle service to and from the airport at specific times during the entire day. Hotel's proximity to the airport, the free shuttle service and convenience of conducting work at the conference rooms have been marketed to attract guests to stay here. The guests also comprise of people who are in transit between airports. Also, when there are long-duration delays in flight operations due to which passengers need to be provided overnight accommodation, few airline operators host their guests here. Like all other guests, these airline operators are also interested in Staywell for its location and low-cost room rental.

Over the past decade, management of Staywell has ploughed in profits from this establishment to acquire similar properties in other major cities. They function based on business model similar to the original establishment in Mumbai. All of them are now functioning as well-established budget hotels near city airports for cost-conscious business travellers. In all, Staywell hotels have 18 properties spread over 15 cities. To keep its costs of operations within control, Staywell hotels has outsourced its cleaning and food service to specialized vendors. Cleaning service includes cleaning of kitchen crockery, bedding, laundry and housekeeping of premises. The entire set of activities related to preparation of food has been outsourced. Vendor service has been satisfactory, barring few instances where guests have complained of unhygienic rooms or non-palatable food service. However, due to high guest volume and quick turnover of guests due to short stay periods, this has never been a hindrance to business.

This business model has been profitable since its establishment. Staywell Hotels has a sizeable market share in this segment. Competition has increased in the recent past. Price wars have put pressure on profit margins in this segment. The management plans to continue to operate in this segment to maintain its market presence. At the same time, to sustain business in the long term, the management of Staywell Hotels now wants to foray into developing properties for luxury resorts. Target guest segment are vacationing tourists interested in an enjoying a laid-back time in scenic places. These guests would not mind paying premium for availing good quality service.

Required :

(i) IDENTIFY and EXPLAIN the various primary activities of Staywell in its value chain.

(ii) IDENTIFY and EXPLAIN the stage of product life-cycle.

(iii) EVALUATE the risks of outsourcing cleaning and food services for the luxury resort properties.

Answer 2 :

(i) The Five Primary Activities of Michael Porter's Value Chain Model are :

Inbound Logistics
Activities related to receiving, handling of materials from the supplier and their storage until further use later in operations. In the case of Staywell Hotels, materials would include food service received from the vendor. This needs to be stored and maintained properly until the items are ordered by the guest. Similarly, the vendor delivering freshly laundered crockery, bedding and laundry would be materials that need to be stored until their use to serve the guests. These are inbound logistics for the hotel.

Operations
Activities related to converting inputs into production of output or service. In the case of Staywell Hotels, operations would include maintenance of hotel premises including guest rooms, conference rooms and common area. Activities related to ensuring cleanliness and safety of room, working order of facilities offered like TV and internet service, coffee machines, shuttle service are part of hotels operations.

Outbound Logistics
Storage and movement of the end product from the production line to the customer. In the case of Staywell Hotels, it includes activities such as maintaining "non-smoking" rooms as such, so that when the customer finally uses it comes across as a "non-smoking" room. Likewise, the food should be prepared in a professional manner, stored in such a way that it ensures customer satisfaction and safety. Therefore, the review of food items to remove the ones past expiry would be part of Outbound Logistics. Therefore, any activity relating to making sure that the guests get what they have ordered for, would be part of outbound logistics.

Marketing and Sales
The activities related to communicating, selling, and delivering the product or service to the customer. In the case of Staywell Hotels, advertising its properties to the cost and time conscious traveller would be a marketing activity. Free shuttle service is a promotional activity to attract guests. Any agreement with airline companies to accommodate guests would also form part of this activity.

Service
All types of service such as after sales service, handling customer complaints, customer support, training etc. In the case of Staywell, service is one of the most important activities in their value chain model. Good service ensures happy guests. Therefore, all activities from front-desk, room service, catering, repair services, shuttle service would be included here. All employees have to trained to handle needs of the guests in an effective and efficient manner.

(ii) Product Life-cycle Stage of Staywell Hotels

"Budget Accommodation" to the cost and time conscious traveller is the current product offering of Staywell Hotels. Starting out with a single establishment, Staywell Hotels ploughed in profits to expand its business offering to other cities as well. The product has been well established in the past decade. Competition is intense indicating similar offering by rivals. Price wars have put pressure on profit margins. Staywell Hotels plans to continue in this segment due to its sizeable market share. This information indicates that Staywell Hotels is in the maturity stage of its product lifecycle. It has a well-established product, with a sizeable market share at the same time it is now facing competition. Business has hit a plateau. Hence, Staywell Hotels needs to improve its product offering to beat competition. The management plans to foray into luxury resort business is an indication of its future plans to sustain business.

(iii) Risks of Outsourcing Cleaning and Food Service under the Luxury Resort Model

Staywell Hotels is a budget accommodation provider to the cost and time conscious traveller. Primary feature of this model is "value for money". To remain profitable the cleaning and food service has been outsourced, which enables Staywell Hotels to keep the costs of operation low. There have been instances of dis-satisfaction among guests as regards quality of cleaning and food service. However, since the turnover of guests is quick due to high volume and short stay period, it has not negatively impacted business.

In the luxury resort business, the target guests are travellers on leisure. The primary feature of this model would be "good quality of service". Maintaining cleanliness of premises and food service are critical activities in the operation of luxury hotels. Therefore, customer satisfaction on these metrics is paramount to sustain and grow business. With the ability to post reviews online on booking portals, any negative review (whether justified or not) can reach very easily to a large number of potential guests. This can negatively impact future business. Hence, Staywell Hotels has to ensure that the quality of service that it provides in terms of cleanliness and food should meet and beat the guest's expectation.

Outsourcing these services to well established vendors is advantageous since the focus can remain on improving guest experience. It may also be cost advantageous in many cases. However, there are number of risks in this model. Detailed service level agreements need to be drawn up to ensure that the required quality of service is being provided. Staywell Hotels should be able to monitor the performance of these vendors. In cases of non-delivery of the required level of service, the agreement should provide for means of redressal. This could vary from compensation for any loss in business to immediate termination of service. Staywell Hotels should ensure that it can easily and economically switch service providers if required. For this it has to identify alternate vendors who can provide the same level of service as the current ones. The other risk in outsourcing could be of instances where well performing vendors could go bankrupt and shut shop. In such cases, Staywell Hotel's operations could be immediately impacted since such services can no longer be availed from these vendors. Again, list of alternate service providers is a necessary back-up that the hotel should have.

Alternatively, since these are very critical activities to business operations, Staywell Hotels may choose to have complete control over them. This can be achieved by having in-house departments that cater to cleanliness and food service. Control over factors such as input material used, the performance of service, equipment used, training of staff and other essential activities can ensure that the required service quality can be achieved. Better service enhances guest experience. Compared to outsourcing, this might be a costlier option. However, since the guests are ready to pay a premium for service quality, within reasonable limits cost need not be a primary concern for Staywell Hotels for this business model.

Question 3 : [Case Scenario]

Ethical and Non-Financial Considerations

Sprinter Sportswear is a multi-national company which has a market presence in 23 countries. Yet, the company does not own even a single factory. Production has been entirely outsourced to 175 factories located in places where cost of operations is low. Factories cater entirely to Sprinter's procurement demands. These factories operate independently, Sprinter plays no role in their operations. Procurements from these suppliers network is stored at distribution centers from where dispatches are made to wholesalers of sportswear and apparel.

Recent news reports from some of the Third World foreign countries have indicated that there is a high child labor employment. Child Labor although against the law in these countries is resorted in order to keep cost of operations low. Factories in these countries do not directly employ children. Instead they subcontract the work to contractors. These contractors in turn hire children illegally without the local knowledge of local law enforcement authorities. In addition, working conditions in these factories are very unhygienic and oppressive.

Sprinter initially turned a blind eye to this problem, since it only acts as a customer of these factories. Sprinter, as a company, has done nothing illegal as a part of company operations. However, increased focus given to corporate social responsibility, has forced the Board members to consider taking action against such factories.

Required :

(i) DISCUSS why Sprinter sportswear should attempt to address this issue.

(ii) SUGGEST some of the actions that the company can take to address this issue.

Answer 3 :

(i) Work can be outsourced to countries on the other side of the globe, in order to achieve low cost advantage. A company may not be directly responsible for faulty practices of its suppliers. However, modern organizations have a moral duty of care to a wider range of stakeholders who may not directly be related to the company. In this case, it owes a duty of care towards employees hired by factories within its supply chain. The issue it is dealing with relates to exploitation of child workers by factories, perpetrated by sub-contracting work to third party contractors. While Sprinter sportswear has not done anything illegal, it owes moral responsibility towards these children. Children have a right to education, because of which child labor is illegal in most countries. Since children are employed directly on account of the work that has been outsourced. Sprinter should attempt to address this issue. Also, any negative news about how its products are made, could impact its business.

(ii) Sprinter should aim to make its products responsibly. Some actions it can take are :

- Sprinter can develop a Code of Conduct that details the acceptable standards of conducting business. These standards could relate to hiring practices of which it can specify that workers should be above a particular age to be employed for manufacturing a product. Others could relate to workplace environment, safety, and environment sustainability. Sprinter should insist that suppliers implement these Codes of Conduct along with other compliances with laws. It should insist that the supplier be open to periodic inspection by Sprinter to ensure compliance with standards as per its Code.

- Sprinter can set up an audit team that regularly audits factories on the pre-sourcing and follow-up stages. Sprinter should do business only with those factories that are complying with its standards. Any offenders to the Code of Conduct in the follow-up stages, should be held liable to penalty or termination of contract for serious offenses.

- Sprinter can list on its website, location wise suppliers from whom it procures its products. It can even give information about products made by each of its suppliers, average age of workers, worker diversity etc. This will enable watch groups to know who the suppliers are and warn the company if there are any child labour issues within these factories.

Question 4 : [Practical Question]

Performance Measurement

Established in the year 1999, **FF Company** is the pioneer of fast food in Southampton. It delivers a truly fresh, affordable, made to order sandwiches, burger, and other meals in a friendly and relaxed environment. The popularity of the sandwiches, burger etc. continued to grow over the decades but one thing remained the same and that was its core values and principles.

- Always provide exceptional service to valued guests,
- Provide the highest quality menu items at a price everyone can afford and enjoy, and
- Keep operating costs low and ensure to have great systems in place and never stop improving.

It provides a comfortable place for people to unwind over interesting conversations. From the beginning, as it continues to grow, it is guided by passion for delighting customers by serving fresh, delicious food right in front of customer.

The performance report of burger segment for FY 2018-19 was presented at the management committee meeting as follows :

Particulars	Budget	Actual	Variance
Sales/Production (no. of burgers)	2,00,000	1,65,000	(35,000)
Sales (£)	10,50,000	8,46,450	(2,03,550)
Less: Variable Costs (£)	6,33,000	5,37,075	95,925
Less: Fixed Costs (£)	1,57,500	1,65,000	(7,500)
Profit (£)	2,59,500	1,44,375	(1,15,125)

The Management Accountant of FF believed that the size of the fast-food market deriving the budget number of burgers to be sold is over-estimated. He has computed the value of the sales volume contribution planning variance to be 26,062.50 adverse.

Further, the report also included customer's feedback and the majority of comments were regarding delay in service time. One of feedback was as follows :

"I ordered two burgers at 2:10 pm. After half an hour (30 minutes) of waiting I called the waiter and asked him what happened? He told me that he will check with kitchen. I got the order after 45 minutes of waiting, this cafe is not good in delivery time."

The budgeted data shown in the table is based on the assumption that total market size would be 4,00,000 units.

Required :

(i) PREPARE a reconciliation statement of budgeted profit to actual profit through marginal costing approach in as much details as possible.

(ii) EXPLAIN the implications of the reconciliation statement.

(iii) Management is worried about customer's feedback. ADVISE measures to improve delivery service time.

Answer 4 :

(i) Statement of Reconciliation – Budgeted Vs Actual Profit : (Refer working below)

Particulars	**£**
Budgeted Profit	2,59,500.00
Less: Sales Price Variance (WN 1)	(19,800.00)
Less: Sales Volume Contribution – Planning Variance (Given)	(26,062.50)
Less: Sales Volume Contribution – Operational Variance (WN 2)	(46,912.50)
Less: Variable Cost Variance (WN 3)	(14,850.00)
Less: Fixed Cost / Expenditure Variance (WN 4)	(7,500.00)
Actual Profit	1,44,375.00

Workings :

Basic Workings

Budgeted Market Share (in %) = $\frac{\text{2,00,000 units}}{\text{4,00,000 units}}$ = 50%

Budgeted Contribution = £10,50,000 - £6,33,000 = £4,17,000

Average Budgeted Contribution (per unit)

= $\frac{\text{£ 4,17,000}}{\text{2,00,000 units}}$ = £ 2.085 per unit

Sales Volume Contribution Planning Variance = Market Size Variance

= Bud. Contribution p.u. x [Budgeted Market Share % x (Bud. Mkt. Size - Actual Mkt. Size)]

£ 26,062.50 (A) = £ 2.085 x [50% x (4,00,000 units - Actual Mkt. Size)]

£ 26,062.50 / £ 2.085 = [50% x (4,00,000 units - Actual Mkt. Size)]

12,500 = 50% x (4,00,000 units - Actual Mkt. Size)

12,500 / 50% = 4,00,000 units - Actual Mkt. Size

25,000 = 4,00,000 units - Actual Mkt. Size

Actual Market Size = 4,00,000 units - 25,000 units = 3,75,000 units

Actual Market share (in %) = $\frac{\text{1,65,000 units}}{\text{3,75,000 units}}$ = 44%

Standard Sales Price per unit = $\frac{\text{£ 10,50,000}}{\text{2,00,000 units}}$ = £ 5.25

Actual Sales Price per unit = $\frac{\text{£ 8,46,450}}{\text{1,65,000 units}}$ = £ 5.13

Standard Variable Cost per unit = $\frac{\text{£ 6,33,000}}{\text{2,00,000 units}}$ = £ 3.165

Actual Variable Cost per unit = £ 5,37,075 / 1,65,000 units = £ 3.255

Calculation of Variances :

(1) Sales Price Variance = AQ sold x (SSP - ASP)

= 1,65,000 x (£ 5.13 - £ 5.25) = £ 19,800 (A)

(2) Market Share Variance = Contribution Volume Operational Variance

= Bud. Cont. p.u. x [Actual Market Size x (Bud. Mkt. Share - Actual Mkt. Share)]

= £ 2.085 x [3,75,000 x (50% - 44%)]

= £ 2.085 x [3,75,000 x 6% reduction]

= £ 46,912.50 (A)

OR

Total Contribution Volume Variance

= Bud. Cont. p.u. x [Bud. Sales Qty. - Actual Sales Qty.]

= £ 2.085 x [2,00,000 units - 1,65,000]

= £ 72,975 (A)

Market Share Variance = Total Contrib. Volume Variance - Market Size Variance

= £ 72,975 (A) - £ 26,062.50 (A)

= £ 46,912.50 (A)

(3) Variable Cost Variance = Standard V.C. for actual output - Actual Variable Cost

= Actual Output x (Std. VC p.u. - Actual VC p.u.)

= 1,65,000 units x (£ 3.165 - £ 3.255)

= £ 14,850 (A)

(4) Fixed Cost Variance = Fixed OH Expenditure Variance under Marginal Costing

= Budgeted Fixed Cost – Actual Fixed Cost

= £ 1,57,500 - £ 1,65,000

= £ 7,500 (A)

(ii) Implications of Reconciliation Statement :

In the revised statement, the sales volume variance has been detailed by the way of two variances i.e. planning and operational variances. This kind of detailed information assists the company to check, which kind of variances are under the management control and which are not. FF has adverse volume contribution planning variance (i.e. Market Size Variance) and the reason of this could be the environmental / market changes, that was not anticipated at the time of budget preparation. Hence, they are not under management control and no one is responsible for this.

On the other hand, the sales volume contribution operational variance (i.e. Market Share Variance) was under control of the managers and they should be held responsible for the same. The reason of adverse sales volume contribution operational variance could be unsuccessful direct selling efforts / marketing efforts. FF has adverse sales price variance as well. It indicates that the burgers were sold for lower price than standard. The reason for this could be unforeseen market competitive price, tapping new market etc.

Further, revised reconciliation statement delivers little information about the variable cost and fixed cost variances. They both are adverse. Fixed cost consists of mainly items such as salaries, annual maintenance cost, rent and insurance etc. Often fixed cost items are not affected in short run in response to change in the level of activity, but they might change in response to other factors such as price. This may cause increase in expenditure on fixed overheads. A meaningful analysis of fixed cost variance requires a line to line comparison of budgeted cost with actual cost.

In case of FF, the variable cost may be made up of large individual different items such as vegetables, gas, indirect labour, regular maintenance cost etc. Control of variable cost also requires line by line analysis for each individual cost items. The adverse variable cost variance simply reveals that FF incurred more on variable cost than expected. However, it is necessary to take into consideration the causes of this adverse variance, which is beyond the control of the management, for instance, the unusual price hike in vegetables in case of unseasonal rainfall etc.

(iii) Measures to Improve Fast Food Delivery Service Time :

Customers expect that their food order to be delivered quickly. From customer's feedback in the question, it is evident that FF has a problem in food delivery, due to which, customers go unsatisfied. The reason of late delivery could be non-availability of raw material on time or employees not working properly etc. The reason of employees not working properly could be job dissatisfaction which may be due to improper working conditions, low salary, or no reward for overtime etc.

In order to reduce delivery time, raw material should be made available in stock based on daily requirement. FF may follow quantitative approach to inventory problems, which lays down clear guidelines that when to re-order or to alert the management in exceptional situations.

In addition, FF must also address the issues related to employee and involve them in a loop. FF could improve the employee satisfaction with proper working conditions, better pay, training, and growth opportunities.

Moreover, it is important that customers should be informed about approximate delivery time since this will reduce customer's anxiety and will proactively reduce any complaints over long waits for delivery of food. If unexpected delays occur, it is important to communicate with customers, apologies for the delay and inform them about the new approximate delivery time along with valid reason.

In addition to this, FF can also introduce SMS service for expected delivery time or install electronic board displaying ticket number or self-serve kiosk allowing customers to roam around or order in advance so that they do not have long waiting time.

Question 5 : [Practical Question]

Transfer Pricing

A manufacturer has two divisions. Division A and Division B. Division B produces components that are used by both Division A as well as external customers. Division A gets its entire requirement of the components from Division B.

The annual production capacity of Division B is 1,00,000 units. The division operates at full capacity, with no inventory at the beginning and end of the year. It sells its components to external customers at ₹ 4,000 per unit. Variable cost of production for the component is ₹ 2,750. Internally, it transfers it components to Division A factoring any opportunity cost in the form of lost sales. Total sales of Division B were ₹ 36 crores of which sales to external customers was ₹ 20 crores.

As per company policy, demand from Division A has priority over external customers. This year, there was an additional demand from external customers for 18,000 components. However, since Division B operated at full capacity, this demand was not catered to.

Required :

(i) ANALYZE the Sales in terms of Rupees and Units made by Division B to both external and internal customers.

(ii) RECOMMEND the transfer pricing range that would promote goal congruence between Division A and B.

(iii) DISCUSS the effect of changes in external demand on the transfer price for the company, assuming the current policy continues.

Answer 5 :

(i) Sales Analysis of Division B :

Total annual capacity and actual production of Division B is 1,00,000 units of components. Zero inventory implies that sales for the year was also 1,00,000 units of components. Sales to external customers was ₹ 20 crores, at ₹ 4,000 per unit. Therefore, units sold to external customers would be 50,000 units this year (i.e. ₹ 20 crores / ₹ 4,000 per unit).

Therefore, internal sales can be derived as the remaining 50,000 units for the year (annual sales 100,000 units less external sales 50,000 units). For the year, value of sales made to Division A is ₹ 16 crore (i.e. Total sales of ₹ 36 crore less external sales of ₹ 20 crores). The internal transfer price shall be ₹ 3,200 per unit (i.e. ₹ 16 crores / 50,000 units).

Had there been no extra demand, opportunity cost for Division B would have been NIL. Therefore, minimum transfer price would only be the variable cost of ₹ 2,750 per unit of component. However, as given in the problem, that there was an excess demand for 18,000 units of components from external customers, that could not be met since Division B had to give priority to internal demand. Had these sales been made, Division B would have earned ₹ 1,250 per unit contribution (Sale price ₹ 4,000 per unit less variable cost ₹ 2,750 per unit). This lost contribution of ₹ 1,250 per unit is the opportunity cost per unit for Division B. Due to company's policy of giving priority to internal demand, Division B lost a total contribution of ₹ 2.25 crore during the year (i.e. 18,000 units x contribution of ₹ 1,250 per unit).

Therefore, internal sales comprises of two parts :
32,000 units of components transferred at variable cost ₹ 2,750. This amounts to ₹ 8.8 crores. There is no opportunity cost in this internal transfer.
18,000 units of components transferred factoring any opportunity cost = variable cost + contribution per unit = external sales price = ₹ 4,000 per unit. This amounts to ₹ 7.2 crores.
Therefore, total internal sales = ₹ 8.8 crores + ₹ 7.2 crores = ₹ 16 crores.

Summarizing : External sales are 50,000 units amounting to ₹ 20 crores annual sales value. Internal sales are 50,000 units amounting to ₹ 16 crores annual sales value. Transfer price for 32,000 units is at variable cost of ₹ 2,750 per unit while for 18,000 units it is at external sales price of ₹ 4,000 per unit.

(ii) Transfer Price Range for Divisions A and B

Division A procures its entire demand of 50,000 units from Division B. Out of this, 18,000 units at market price of ₹ 4,000 per unit while 32,000 units are procured at a lower rate ₹ 2,750 per unit. Had Division A procured 32,000 units from the market, the additional cost of procurement would be ₹ 4 crores [i.e. (₹ 4,000 - ₹ 2,750) x 32,000 units]. Division A currently enjoys this benefit of lower procurement cost. Financials of Division B shows no profit from such internal transfers. This may skew the performance assessment of the divisions, if it is based primarily on financial metrics of each division. In order to promote goal congruence, some portion of this benefit can be shared with Division B.

Division B will at the minimum want to recover its variable cost of ₹ 2,750 per unit, while Division A will be ready to pay maximum up to external market price of ₹ 4,000 per unit. Therefore, transfer price range can be set between ₹2,750 - ₹4,000 per unit. Division A enjoys lower procurement rate while Division B's financials reflect some benefit of transferring components internally to Division A.

(iii) Impact of External Demand on Transfer Price

As per the company's transfer pricing policy, Division B gives priority to demand from Division A. The division has a production capacity of 1,00,000 units annually. If there is no external market for Division B's components, then transfer price for the entire internal transfer would be the variable cost of ₹ 2,750 per unit plus portion of the fixed cost (if any). This is the minimum cost that Division B would like to recover from Division A.

When there is an external market, transfer price would depend on whether Division B had to incur any opportunity in the form of lost sales. When total demand (internal and external) is within production capacity of 1,00,000 units, the entire demand can be met. There would be no lost sales for Division B, no opportunity cost. Therefore, transfer price for the entire internal transfer would be the variable cost of ₹ 2,750 per unit. This is the minimum cost that Division B would like to recover from Division A.

When there is an external market, such that total demand (internal and external) is more than production capacity of 1,00,000 units, due to priority given to internal transfer, some portion of the external demand might not be met. This would be lost sales for Division B, opportunity cost would be the contribution loss from such sales at ₹ 1,250 per unit. This opportunity cost would be passed on to Division A. As explained in part (ii) above, transfer price range will be from ₹2,750 - ₹4,000 per unit. More lost sales for Division B would keep the average transfer price higher towards ₹4,000 per unit. Lesser lost sales for Division B would keep the average transfer price towards the lower bound of ₹2,750 per unit. Therefore, the proportion of external demand that could not be catered to, would determine the average transfer price. Higher the demand from external customers would drive up the average transfer price within the company.

Question 6 : [Practical Question]

Cost of Quality

H Automobile Group is among top 20 business houses in India. It has been founded in the year 1930, at the height of India's movement for independence from the British, the group has an illustrious history. H's footprint stretches over a wide range of industries, spanning automobiles (two wheelers manufacturer and three wheelers manufacturer). H's headquarter is located at Hyderabad. Bike Production is one of segment of H Group. Management of H wants to analyse the following actual information for the April.

Cost Data :

Customer Complaints Centre Cost	35 per hr.
Equipment Testing Cost	18 per hr.
Warranty Repair Cost	1,560 per bike
Manufacturing Rework Cost	228 per bike

Volume and Activity Data :

Bikes Requiring Manufacturing Rework	3,200 bikes
Bikes Requiring Warranty Repair	2,600 bikes
Production Line Equipment Testing Time	1,600 hrs.
Customer Complaints Centre Time	2,000 hrs.

Additional Information :

Due to the quality issues in the month, the bike production line experienced unproductive 'down time' which cost ₹ 7,70,000. H carried out a quality review of its existing suppliers to enhance quality levels during the month at a cost of ₹ 1,25,000.

Required :

(i) PREPARE a statement showing 'Total Quality Costs'

(ii) ADVISE any TWO measures to reduce the non-conformance cost.

Answer 6 :

(i) Statement Showing 'Total Quality Costs' :

Particulars of Costs	**₹**
Prevention Costs :	
Supplier Review	1,25,000
Appraisal Costs :	
Equipment Testing (₹ 18 per hr. x 1,600 hrs.)	28,800
Internal Failure Costs :	
Unproductive Down Time	7,70,000
Manufacturing Rework (₹ 228 per bike x 3,200 bikes)	7,29,600
External Failure Costs :	
Customer Complaints (₹ 35 per hr. x 2,000 hrs.)	70,000
Warranty Repair (₹ 1,560 per bike x 2,600 bikes)	40,56,000
Total Quality Costs	57,79,400

(ii) The reporting of quality costs highlights the cost of quality activities at H. The total quality costs statement clearly displays the relationship between conformance costs (prevention and appraisal costs) and non-conformance costs (internal failure and external failure costs) and the drivers of a reduction in the overall spending on quality. Statement indicates that only 2.16% of the total quality cost is the cost of preventing quality problems while 0.50% is the cost of appraisal activities. Thus, prevention and appraisal costs make up only 2.66% of total quality costs. In contrast, 97.34% of quality control costs are incurred for internal and external failure costs. Following two measures can be used to reduce non-conformance cost.

(1) Total Productive Maintenance (TPM) is a system of maintenance and improving the integrity of production and quality system through keeping all equipment in top working conditions so as to avoid breakdowns and delays in manufacturing processes. It involves identifying machines in every division (including planning, manufacturing, maintenance) and then planning & executing the maintenance programme covering their entire useful life.

In this scenario, TPM will help in reducing internal failure cost (i.e. downtime and manufacturing rework cost), which constitutes 25.95% of total quality cost, by keeping all equipment in good working conditions so that there is no downtime or machine breakdown and ensuring that all equipment run smoothly. If machines work properly, the chances of rework will reduce, ultimately it will also reduce chances of warranty repair and customer complaints (comprising 71.39% of total quality cost which is the major part of total quality cost).

(2) Total Quality Management (TQM) aims at improving the quality of organisational output, including goods and services, through continuous improvement of internal practices. Its objective is to eradicate waste and increase efficiency without compromising with the quality. It requires that the company maintains its quality standards in all aspects of business by ensuring that things are done right at the first time itself, so that defects and wastes are eliminated from operation.

It appears that H is not a TQM company at present due to huge disparity between conformance costs and non-conformance costs. In order to make H to be successful, all staff at H must be engaged in the improvement process and share its continuous improvement ethos. In order to establish a reputation as a high-quality bike manufacturer, H must ensure that the staff are focussed on quality and attitudes changed towards the importance of conformance activities. For instance, H can conduct third party inspection of raw material at supplier's workplace leading to maintenances of quality standards.

Overall, while applying the above two measures in H, consideration must be given to the optimum balance between the costs of conformance and the costs of non-conformance.

Question 7 : [Practical Question]

Special Order Decision

N2 Co. is the manufacturer and supplier of fire fighting and safety equipment for industrial use and follows the international quality standards and uses the high grade raw material. It is a fast-growing brand that protects millions of people across India. N2 has been offered a bid on a prospective export contract for 20,000 commercial fire extinguishers with following specification from USA buyer and the delivery terms is FOB.

"two-gallon cylinder holding 10 pounds of multi-purpose dry chemical at 380 PSI".

N2 is exporting first time. The price computation per fire extinguisher is as follows:

Particulars	₹	₹
Direct Material :		
Circle Part Cost	620	
Necking Part	30	
Bottom Part	50	
Fire Extinguisher Powder	590	
Heat Process	50	
Nozzle	60	
Meter	20	
Pipe	50	
Nitrogen	30	1,500
Direct Labour (2 hrs. x Rs. 40)		80
Leakage Testing		50
Variable Overheads (including packing)		214
Export Clearance Charges on FOB term		36
Fixed Overhead		100
Total		1,980
Add: Mark up @ 10%		198
Price		2,178
USD to INR		67
Price in USD		**32.51**

After quotation of USD 32.51, the buyer is negotiating the price and ready to pay only USD 28.50.

Required :

ADVISE whether it is worth accepting at USD 28.50 considering other factors.

Answer 7 :

Workings :

Statement Showing Benefit from Prospective Export Contract :

Particulars	Amount
Direct Material	1,500
Direct Labour (2 hrs x ₹ 40)	80
Leakage Testing	50
Variable Overheads (including packing)	214
Export Clearance Charges on FOB term	36
Total Relevant Cost	₹ 1,880
USD to INR	₹ 67
Relevant Cost	$ 28.06
Price Offered by Customer	$ 28.50
Benefit per extinguisher	$ 0.44
No. of extinguishers	20,000
Total Benefit	$ 8,800

Advise :

From financial perspective, it will be profitable for N2 to accept the contract because of gain of $8,800 (i.e. ₹ 5,89,600 approx). N2 may get some export incentives or duty drawback also. Besides this, following consideration should also be taken into consideration while exporting fire extinguishers.

Statutory Compliance

Before exporting to a foreign country or even agreeing to sell to a new customer in a foreign country, N2 should be aware of foreign laws that might affect the sale. Export documentation is important as it plays a significant role in regulating the flow and movement of goods in international markets. Each country has its own prescribed statutory documents to be complied by exporters and importers. Thus, N2 should consider about the documentation and inspection compliance part of new buyer. It may include third party audit, commercial invoice and packaging list requirements, certificate requirements like – no child labour certificate, inspection certificate, reach compliance certificate etc. If any compliance requirement is not met, what will be the consequences? There may be stiff penalty to be paid owing to non-compliance or failure to accurately comply with the export obligation.

Buyer Credit worthiness

It is necessary that before shipment, the exporter to carry out its own credit check on the importer to determine credit worthiness. Thus, N2 should make a proper assessment of the credit worthiness of the foreign buyer and spend sufficient time in cross checking the credit worthiness of his counterpart to avoid any kind of unforeseen situation in future. Such information can be easily availed through contacts or through ECGC. Private agencies also provide information on paid service basis. However, this risk can be covered by asking for LC payment terms or 100% advance or opting for post shipment insurance for goods being exported.

Industry Analysis

Industry analysis involves such things as assessing the competition in the industry, the interplay of supply and demand in the industry; how the industry holds up against other industries that are emerging and providing competitions, the likely future of the industry, especially in light of technological developments; how credit works in the industry; and the exact extent of the impact that external factors have on the industry.

For N2, it is worthwhile to know the current and future demand of fire extinguisher and factors influencing the growth of global fire extinguisher market. N2 can perform industry analysis through three main ways i.e. the Competitive Forces Model (also known as Porter's 5 Forces); the broad factors analysis, also known as PEST analysis; and SWOT analysis. It may also arrange industry report from trusted sources.

Additional Terms

Ensure that the all terms are clear and suit the business purpose. For instance, delivery terms should provide date of shipment or means of determining the date. In some circumstances, a late delivery penalty may be incurred where goods are not supplied by a specific delivery date. Therefore, N2 should evaluate whether shipment date is attainable or not. If the target shipment date could not be met, what will be the charges? Further, N2 must also check whether the foreign bank charges are subject to beneficiary account. If yes, then the same must be considered in the quotation.

Overall, N2 should accept the proposed contract only after due and careful consideration of the above factors.

Question 8 : [Practical Question]

Life Cycle Costing

Mould & Dies (M&D) was established in 1980 and has enormous wealth of experience in the mould manufacturing industry and serves wide range of plastic moulds all over nation. Over the past decade, M&D has developed the reputation for quality products & services for customer focused approach. It deals in injection moulds, blow moulds, die sets, moulds base etc.

With a state-of-the-art infrastructure facility, M&D is able to meet the qualitative and quantitative demands of its clients. Its vision & mission is to provide high class manufactured products by using best quality raw materials.

M&D has developed a new product "M" which is about to be launched into the market and anticipates to sell 80,000 of these units at a sales price of ₹ 300 over the product's life cycle of four years. Data pertaining to product "M" are as follows :

Costs of Design and Development of Moulds, Dies, and Other Tools	₹ 8,25,000
Manufacturing Costs	₹ 125 per unit
Selling Costs	₹ 12,500 per year + ₹ 100 per unit
Administration Costs	₹ 50,000 per year
Warranty Expenses	5 Replacement Parts per 25 units at ₹ 10 per part; 1 Visit per 500 units (cost ₹ 500 per visit)

Required :

(i) COMPUTE the product M's 'Life Cycle Cost'.

(ii) SUGGEST two ways to maximize M's lifecycle return.

Note : Ignore time value of money

Answer 8 :

(i) Statement Showing M's Life Cycle Cost (for 80,000 units) :

Particulars	Amount (₹)
Costs of Design and Development of Moulds, Dies, and Other Tools	8,25,000
Manufacturing Costs (₹ 125 x 80,000 units)	1,00,00,000
Selling Costs [(₹12,500 p.a. x 4 years) + (₹ 100 p.u. x 80,000 units)]	80,50,000
Administration Costs (₹ 50,000 p.a. x 4 years)	2,00,000
Warranty Expenses : (80,000 units / 25 units x 5 parts x ₹ 10 per part) (80,000 units / 500 units x 1 visit x ₹ 500 per visit)	 1,60,000 80,000
Total Life Cycle Cost	1,93,15,000

(ii) Following ways may be suggested to maximize M's lifecycle return :

R&D Costs

Often a significant part of the cost is incurred at R&D phase of new product, hence M&D should carefully plan and design its new product "M" as it will determine the number of parts, production process to be used etc. M&D can apply **value engineering** here. It involves improving product quality, reducing product costs, fostering innovation, eliminating unnecessary and costly design elements, ensuring efficient investment in product, and developing implementation procedures. Value engineering is most successful when it is performed early in product development stage. A value engineering study should be performed within the first 25-30% of the design effort prior to selecting the final design alternative. Here, it is also important that R&D team should work as a part of cross functional team i.e. (participation in a group of people from different functional areas), to minimise lifecycle cost and the production cycle time in new development.

Speed up the Product Launch

In cut throat competitions, it is important for M&D to get new product "M" launched into the market as soon as possible, since this will give "M" a **long stay** in the market place without competition in the market. Competitors will always try to launch a rival product as quickly as possible in order to gain 'competitive edge'. M&D may lose overall profitability if it delays in launching of Product "M". It is usually worthwhile incurring extra costs to keep the launch on schedule or to speed up the launch.

Question 9 : [Practical Question]

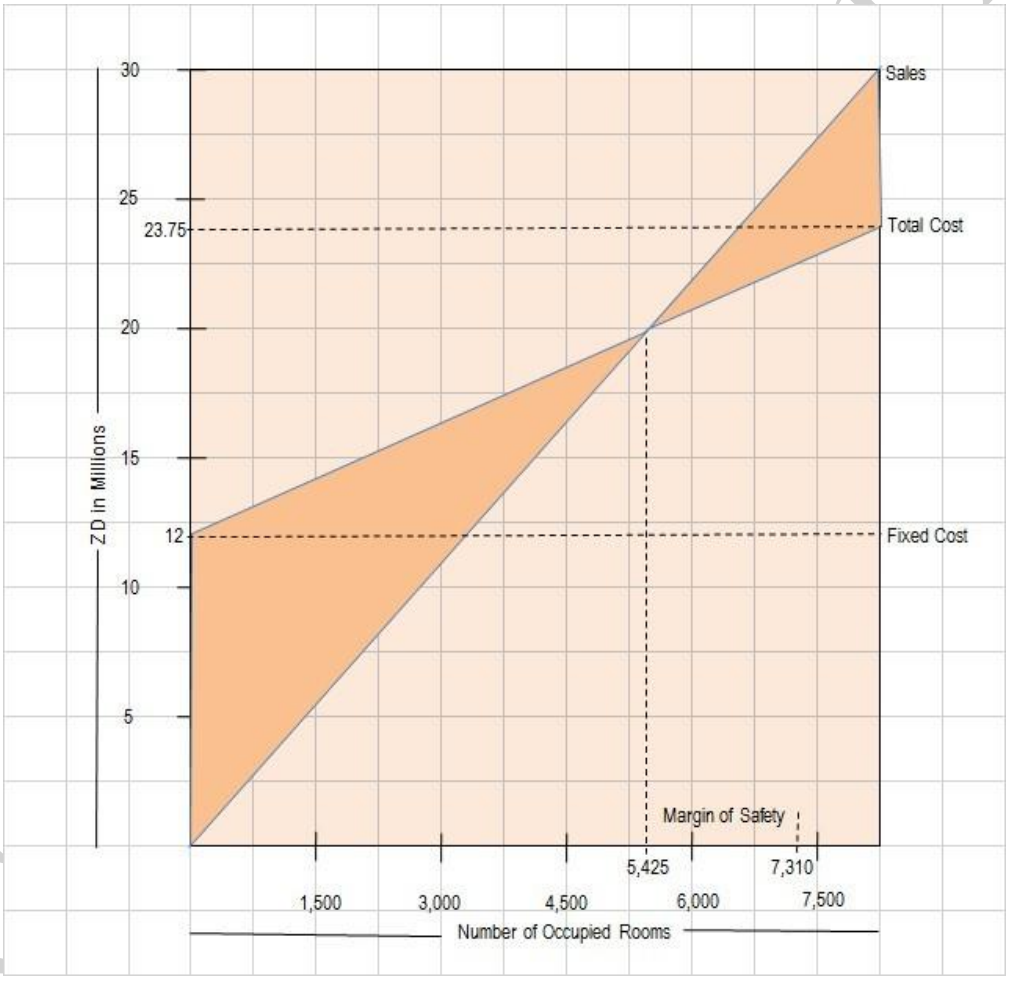
CVP Analysis

Hotel Nikko, Zeeland, an affordable leisure hotel resort is an ideal retreat to escape, unwind and enjoy peace of mind. Set amid expansive tropical greenery in the enclave of Zeeland, Hotel Nikko is designed for pleasure, where services reign supreme and Italian-style architecture of its 25 classic rooms harmonize with nature. Hotel Nikko, Zeeland is a beachfront resort that features a good choice of swim-up pool bar, gym, and variety of restaurants. A wide array of water sport activities like surfing, sailing, jet skiing etc. are available from beach operators at walking distance. The hotel is synonymous with enjoyment and value for money, with a large choice of very attractive "All Inclusive" packages.

Nikko charges guests ZD 2,700 per room per night, irrespective of single or double occupancy. The variable cost is ZD 900 per occupied room per night. The Nikko is available throughout 365 days a year and has a 75% budgeted occupancy rate. Fixed costs are budgeted at ZD 9 million and are incurred evenly during the year.

During the second quarter (Q2) of the year, usually the room occupancy rates remain substantially below the levels expected at other quarters of the year. Nikko is expecting to sell 900 occupied room nights during Q2. Management is considering strategy to improve profitability, including closing the Nikko for the duration of Q2 or adopting one possible option as follows –

There is scope to extend the Nikko by creating enough space to run a Rustic Chic, Italian Style restaurant to serve its guests. The annual revenues, costs and sales volumes for the combined operations are given in the following graph –



Note : Zeeland's home currency is the ZD

Required : ANALYZE the profit improvement plan.

Answer 9 :

The Present Profit of Hotel Nikko :

Total Room Days Occupied = 25 Rooms x 365 Days x 75% = 6,844 room days (approx)

Profit = Total Contribution – Fixed Cost

= [6,844 room days x (ZD 2,700 – ZD 900)] – ZD 90,00,000

= ZD 33,19,200

The Present BEP of Hotel Nikko :

Present contribution per room per day = ZD 2,700 – ZD 900 = ZD 1,800

Present BEP = Fixed Cost / Contribution per room day

= ZD 90,00,000 / ZD 1,800 = 5,000 room days

If Nikko is Shut Down during Q2 :

Loss of Contribution [900 Room Days x (ZD 2,700 – ZD 900)] = ZD 16,20,000

Nikko should not close its hotel during Q2. The total fixed costs will still be incurred and hotel closure would result in lost contribution of ZD 16,20,000. This in turn would decrease annual profits by ZD 16,20,000. In addition, Nikko could lose guests at other quarters of the year, particularly their regular business customers, who may perceive the Nikko as being non-reliable.

Proposal of opening an Italian Restaurant :

Note for Students : Please read and interpret the graph carefully, to find out the following data in it for analysis purpose.

Opening a restaurant will increase the fixed costs of the Nikko from ZD 9 million p.a. to ZD 12 million p.a. Thus, annual increment of ZD 3 million is expected in fixed cost. This can be observed from the total cost line of combined operations provided in a graph.

Average Revenue per occupied room will rise from ZD 2,700 to ZD 3,636.36. (i.e. ZD 30 Million / 8,250 rooms from graph) because of increasing guest expenditure in Italian restaurant.

The total cost predicted at a level of 8,250 occupied rooms is ZD 23.75 million, which means the variable costs must be ZD 11.75 million (ZD 23.75 million – ZD 12 million fixed costs). This amounts to a variable cost per occupied room day as ZD 1,424.24 (i.e. ZD 11.75 Million / 8,250 room days). It is an increase of ZD 524.24 over the previous variable cost per room day (i.e. ZD 1,424.24 - ZD 900).

Consequently, the breakeven point has gone up from 5,000 to 5,425 (as shown in the diagram) occupied rooms. It means, Nikko is required to sell more room nights to recover extra costs. However, budgeted occupancy is now 7,310 occupied room nights which is 80.11% occupancy (i.e. 75% / 6,844 x 7,310). This provides a margin of safety of 1,885 occupied room nights (i.e. 7,310 - 5,425) or a MOS ratio of 25.79% (i.e. 1,885 / 7,310).

At 7,310 occupied room nights, Nikko's budgeted profit would be :

Profit = Total Contribution – Fixed Cost

= [7,310 room days x (ZD 3,636.36 – ZD 1,424.24)] – ZD 12,000,000

= ZD 41,70,597

It is more than present budgeted profit of ZD 33,19,200. The profit of Nikko will increase by ZD 8,51,397. Hence, it is advisable for Nikko to go for opening an Italian Restaurant.

Question 10 : [Practical Question]

Balanced Scorecard

B Steels is a leading manufacturer of flat and long products and have state-of-the-art plants. These plants manufacture value added products covering entire steel value chain right from coal mining to manufacturing Pig Iron, Billets, HR Coils, Black Pipe/GI Pipe, Cable Tapes etc. conforming to international standards. The rock-solid foundation combined with nonstop upgradation and innovation has enabled the B. Steels to surpass its goals constantly. Its vision and values for sustainable growth is balancing economic prosperity and social equality while caring for the planet. It is preparing its balanced scorecard for the year 2018-19. It has identified the following specific objectives for the four perspectives.

Improve post-sales Services	Improve employee morale	Improve employee job satisfaction
Increase gross margin	Increase number of customers	Increase profitability of core product line
Increase plant safety	Increase customer retention	

B. Steels has collected Key Performance Indicators (KPIs) to measure progress towards achieving its specific objectives. The KPIs and corresponding data collected for the year 2018-19 are as follows :

Key Performance Indicators (KPIs)	**Goal**	**Actual**
Average replacement time (number of days)	2	1.5
Gross margin growth percentage	15%	16%
Number of customers	15,000	15,600
Number of plant accidents	0	2
Percentage of repeat customers	83%	81%
Core product line profit as a percentage of core product line sales	5%	4.4%
Employee turnover rate (number of employees leaving / Average number of total employees)	2%	3%
Employees satisfaction rating (1-5, with 1 being the most satisfied	1	1.2

For preparation of Balanced Scorecard report, the following format has been developed :

B. Steels - Balanced Scorecard Report For the year ended March 31, 2019					
Perspective	**Objective**	**KPI**	**Goal**	**Actual**	**Goal Achieved (Yes or No)**
Financial	x	x	x	x	x
Customer	x	x	x	x	x
Internal Business Process	x	x	x	x	x
Learning and Growth	x	X	x	x	x

Required :

(i) PREPARE a balanced scorecard report using the above-mentioned format. Place objective under the appropriate perspective heading in the report. Select a KPI from the list of KPIs that would be appropriate to measure progress towards each objective.

(ii) B. Steels desires to integrate sustainability and corporate social responsibility related KPIs in their balance scorecard to adhere to its vision and values. ADVISE B. Steels, using TBL framework.

Answer 10 :

(i)

B. Steels - Balanced Scorecard Report
For the year ended March 31, 2019

Perspective	Objective	KPI	Goal	Actual	Goal Achieved?
Financial	Increase Gross Margins	Gross margin growth percentage	15%	16%	Yes
	Increase Profitability of Core Product Line	Core product line profit as a percentage of core product line sales	5%	4.4%	No
Customer	Increase number of customers	Number of customers	15,000	15,600	Yes
	Increase customer retention	Percentage of repeat customers	83%	81%	No
Internal Business Process	Improve post sales service	Average replacement time (number of days)	2.0	1.5	Yes
	Increase plant safety	Number of plant accidents	0	2	No
Learning and Growth	Improve employee job satisfaction	Employees satisfaction rating (1-5, with 1 being the most satisfied)	1	1.2	No
	Improve employee morale	Employee turnover rate	2%	3%	No

(ii) **"Triple Bottle Line"** concept encourages companies to measure not only their financial profits, but also the impact that its operations have on the society and environment. Therefore, this framework measures the full cost of doing business by measuring the following bottom lines : (i) Profit (ii) People and (iii) Planet.

Diminishing non-renewable resources have forced businesses to focus on sustainable manufacturing. This term refers to managing manufacturing processes such that they minimize any negative impact on the environment by conserving energy and natural resources. In many instances, improved operational efficiency not only reduces waste (thereby costs) but also improves product safety, it strengthens the brand's reputation and builds public's trust about the company. As a long-term strategy, this improves business viability and provides a competitive edge to the company. This concept is the **"Planet Bottom Line"** within the Triple Bottom Line framework. Metrics on the following aspects may be investigated to find out the environmental impact of business operations.

- Material consumption
- Energy consumption
- Water utilization

- Emissions, treatment of effluents and waste (include emissions affecting air, water, and land)
- Fuel consumption by tracking freight and transportation costs
- Land utilization
- Recyclability and disposal of product

"Corporate Social Responsibility" enables the company to become conscious of the impact its operations has on the society. CSR programs, through philanthropy and volunteer efforts can forge a stronger bond between itself, its employees, and the wider community. Again, this improves both the brand image as well as builds public's trust about the company. This concept is the **"People Bottom Line"** of the Triple Bottom Line framework. Metrics on the following aspects may be investigated to find out the social impact of business operations :

- Work place environment and labour relations
- Occupational health and safety, accident rates
- Human rights practices – child labour, employee work-place security policies
- Training and education
- Equal opportunity employer – diversity of workforce and opportunities available for employees' growth.
- Suppliers – local sourcing versus sourcing from external markets.
- Philanthropy and volunteer programs organized
- Product safety in terms of customer health and safety
- Pricing of essential products to enable wider reach within the society
- Transparent and ethical business practices

B. Steels can study these aspects, determine the relevant metrics, and prepare periodic KPI reports that can help in measuring responsibilities towards sustainability and social impact.

* * * * *

4

RTP - May 2020

Question 1 : [Case Scenario]

Topic : Gain Sharing Arrangements

Raya Health Care Limited is a leading healthcare service provider in Mumbai, it has approximately 450 potential beds, it provides diagnostic and day care speciality facilities also. In diagnostic centres they are using traditional devices for CT Scan and MRI which are not enough as per demand. Patients waited more than weeks for CT and MRI scans, this problem can cause delay in diagnosing illness; waste of time and other resources; not just in radiology but throughout the healthcare system.

Raya has planned to outsource CT scan and MRI services to Livlife, which has world class international chain of diagnostic centre. Livlife promise to provide radiologist report within 24 hours. However, finance manager of Raya doubt that it will not be a profitable arrangement. For the satisfaction of Raya, Livlife has entered an agreement to provide its services to Raya with no guarantee of receiving payment. Raya agrees to the following conditions:

- Cost savings generated in first year, the same will be retained by Livlife.
- Cost savings generated in second and third year will be shared between Raya and Livlife at a ratio of 30%:70%.
- Cost savings generated in the fourth year will be passed to Raya.
- Any cost savings generated by an idea proposed exclusively by Raya that does not require capital investment by Livlife will be immediately passed along to Raya.

Required

DISCUSS the agreement between Raya and Livlife.

Answer 1 :

The agreement between Raya and Livlife is Gain Sharing Arrangement. Gain sharing (also known as cost saving sharing) arrangement is an approach to the review and adjustment of an existing contract, or series of contracts, where the adjustment provides benefits to both parties. A fundamental form of gain-sharing is where a supplier agrees to perform its side of the contract with no guarantee of receiving a payment. Instead, any payment received is based upon the benefits that emerge to the customer as a result of the successful completion of the supplier's side of the bargain.

Livlife and Raya has also entered into such arrangement. This is clearly a risky stance for the supplier i.e. Livlife, because it could spend a fortune and walk away with nothing.

Alternatively, if the benefits to Raya are substantial, Livlife could find itself rewarded with a large return. Cost savings might be attained from reducing the cost of supplies, implementing new skill and technologies, revised delivery time, improvements in operations etc.

The gain, benefit, or advantage to be shared is not necessarily financial, although financial benefits are expected to occur frequently. The Raya, for instance, will not necessarily take

cost savings in the form of a lower contract value but might require a higher specification for medical treatment. However, to assess any financial benefit, both parties have to provide each other with access to relevant cost numbers to determine the basis for the assessment of the benefit and the calculation and sharing of the benefit.

Many contracts involving these arrangements have emphasis on greater openness and shared development and improvement. In the given case gain-sharing deals are, on the face of it, a win-win situation for both Raya and Livlife, interest of both are aligned.

Livlife is trying to save costs of Raya while Raya is trying to get world class services.

Question 2 : [Case Scenario]

Topic : Cost Management in Specific Sector

Fresh Bazar was founded in 2014 as a Fresh Bazar Mart. It provides amazing place for fresh organic fruits and vegetables, after launching its operations in November 2014, it grew to about 150 stores within three years majorly in metro cities, but soon it found that it did not have the systems and infrastructure to support that expansion.

Fruits and Vegetables as a category of competitive market types, which offers these products, very low margins, “while the rental cost and other overheads are very high”.

Also, staff attrition, poor locations, supply-chain issues, and infrastructure problems prompted it to shut nearly 45 stores within two years of the launch. Since then, the company has standardized its operations and increased centralization of its supply chain.

Though they provide all types of fresh organic fruits and vegetables under one roof, instead in local mandis people have to go from one place to another to buy different fruits and vegetables, still they are unable to compete with local vendors.

It also faces huge opposition from politically powerful small vendors, farmers, and middlemen. Fresh bazar had major hurdles in 2016, when it chased out state Uttar Pradesh, Jharkhand, India’s most populous region, after protest by small vendors, farmers, and intermediaries.

Mr. Kailash, manager of Fresh Bazar, purchases fruits and vegetables from wholesale mandis. Price of Fruits and Vegetables fluctuates in wholesale mandis daily basis which is directly depends on the supply of fruits and vegetables by farmers. In addition, supply also depends on transport facilities, rain, political factors etc.

Fresh Bazar sells these fruits and vegetables at the almost same price as of local vendors in local mandis. Though the quality of local vendors is not as good as Fresh Bazar but local public prefer to buy fruits and vegetables from local vendors on road sides.

Their business still requires a lot of investments, and there is no synergy to the activity of the company. Due to all these reasons, Fresh Bazar is incurring continuous losses.

Fresh Bazar wants to expand its business and wants to make money in every store that they set up, and that would be the way in which they scale up their business.

Required

ADVISE is there any scope to reduce losses and increase profitability.

Answer 2 :

Fresh Bazar sells these fruits and vegetables at the almost same price as of local vendors in local mandis. Though the quality of local vendors is not as good as Fresh Bazar but local public prefer to buy fruits and vegetables from local vendors on roadsides. This is because of the bargaining power of the buyer is more from local vendor while Fresh Bazar sells at fixed price.

Fresh Bazar should try to reduce the cost by closely study of the organization's value chain. In agriculture sector, approximately 30% of total production lost every year before it reaches to the consumer. Fresh Bazar can reduce these losses by analyzing the various segments of value chain. In India, each segment of agriculture sector like production, processing, marketing etc. work in an isolated manner and not in integrated manner, resulting in multiple losses in value chain. Fresh Bazar should attempt to integrate all the segments of value chain and try to remove all the intermediaries involved, benefiting both farmers and consumers. Moreover, contract farmingparticipation could enhance the overall value chain performance in terms of increasing production, lowering transaction costs and boosting quality of the output product.

Contract farming is an agreement between buyer and farmers based on which agriculture production being carried out, it also stipulates the quality required and the price at which the farmers agreeing to deliver at a future date.

At present, Fresh Bazar purchases fruits and vegetables from wholesale mandis. Instead of buying from wholesale mandis Fresh Bazar should participate in contract farming to reduce the input price risk i.e. price of fruits and vegetables which fluctuate every day in wholesale mandi. Through contract framing Fresh Bazar can also agree to support the farmers by supplying of inputs, assisting with preparation of land, information about latest technologies, effective use of power supply, providing production advice and transporting produce to its premises to maintain the desired level of quality.

In addition, Fresh Bazar can also use target costing to reduce their other operating costs.

Since the small road side vendors continue to coexist, therefore, Fresh Bazar should also supply their fruits and vegetables to them. In this way, they can avoid opposition from small vendors and farmers, it's a win-win situation benefiting everyone.

Question 3 : [Case Study]

Topic : 5S

Gold-Star Limited deals in manufacturing of traditional cycles. Recently apart from manufacturing old style cycles, GSL starts assembly of electronic cycles.

Since GSL didn't expand the factory area, post starting assembly of electronic cycles; hence production floor largely remains over-occupied with all sort of material, jigs, and tools; some of them are frequently useful, some are often and other are less often; even some are quite rare.

Workers usually complaint that all categories of jigs and tools are not available, tools which are available also of those belongs to those product design which are outdated (majority of such product are not further manufactured by GSL) accessible. Although floor manager is of opinion instead saying tools are not available, it can be said they are not accessible; because workers pick the tool from tool kit or tool board; but not place it back after use;

hence it become difficult to locate such tool later or identify worker; with whom these may available.

On name of maintenance department, there are only two staff members, who are responsible for ensuring that every machine or equipment must be in running order and effective. Due to shortage of staff in maintenance department, requests for repairs of plant or machines are not handled within reasonable time frame and same will result in sharp deterioration of utility/ effectiveness of such plant or machine. Even in some of circumstances, replacements become/ remain only alternative.

GSL has reasonable standardize operating procedure for manufacturing of cycles business, but scenario is worse in case of assembly of electronic cycles. Since GSL is recently entered into assembly of electronic cycles, hence KPIs are not established for all factors which are part of assembly process including critical success factors.

At GSL, the attrition rate at senior management positions is quite high and no formal hierarchy tree is established, which result in drastic shifts in workplace culture (due to frequently changing role & responsibility).

Regarding safety of man and material, GSL is on front foot, taking all reasonable care; which is essential for purpose of eliminating any possibility of workplace accident. But assembly line of electronic cycles witness an incident recently, where one of model “x- 2” during assembly caught fire because wires set of “x-2” come into exposure of sparking from the light point near to such assembly line. Such fire causes burn of some of other material too, which are lying near to such assembly line.

Post such incident, CEO call for meeting with all the top tier executives, majorly including production and operation manager, safety staff, maintenance staff and store manager apart from management accountant. During the meeting while production and operation manager highlights some of problem areas, management accountant quoted 5S as solutions to problems faced by GSL.

CEO asked Management Accountant to be ready with report and presentation on 5S, which can highlight the operational aspect of 5S.

Required

You are deputy to management accountant and asked by him to prepare a case, in form of report; in favour of implementing/ APPLYING 5S at GSL and EXPLAINING the expected benefit from implementation of 5S.

Answer 3 : Report

Addressed to;
Office of CEO,
Gold Star Limited (GSL).
Dated – 07th Jan 2020

Report on operational aspect of 5S and expected advantage

5S represent scientific way of workplace management so that work can be performed effectively, efficiently, and safely. 5S was come into practice as part of Toyota Production System in early of mid- 20th century. 5S is usually considered as essential component of lean manufacturing, and foundation of eight pillars of TPM. The 5S refer to five Japanese words- seiri (sort), seiton (set in order), seiso (shine), seiketsu (standardize), and shitsuke (sustain). They define a system for workplace organization and standardization. Sort means to separate needed and unneeded materials and to remove latter. Set in Order means to arrange materials and equipment so that they are easy to find and use. Shine means to conduct a clean-up campaign. Standardize means to formalize procedures and practices to ensure that all steps are performed correctly.

Finally, sustain means to form habit of always following first four Ss through training, communication etc.

Note - Later 6th S was also introduced and i.e. safety.

S1 - Sorting

In order to overcome the problem of 'idle laying over material' all across production floor area, sorting of material is need to be done in following categories:

- Not needed at all – to be moved to red tag area.
- Needed but not now – need to be moved to store with yellow tag.
- Needed but not here – to be moved to red tag area.
- Needed but not so much quantity.

For purpose of doing sorting GSL need to be answered following questions:

- What is required?
- How much required?
- When it is required?
- Where it is required?

Sorted material depending upon category can be separated and made ready for movement/ shift, in order to segregate the sorted material; visual aid technique can be used by attaching coloured tags to each category of material (called visual sorting).

Following two categories of tag can be used:

Red tag – A card containing detailed information of 'unwanted things' with a given time limit for further action to be taken.

Yellow tag – A card containing detailed information of 'needed things', but not now with a given time limit for further action to be taken – usually kept in store.

Sorting can help GSL to identify:

a) Obsolete material; parts (jigs/tooling) not required as the design has become obsolete.

b) Defective material; part can't be used as it is.

c) Scrap material.

d) Material which not in place – kept at wrong place.

e) Unnecessary/extra/not useful material.

Sorting can also help GSL in reduction of material lying vacant on production floor, by segregating them into different categories and ensure that rarely used material either removed or tagged in red tape area. If material were sorted than 'loss of material' which was lying vacant near to assembly line during fire incident could be saved.

S2 - Set in order

Systemic arrangement by ensuring 'place for everything and everything in its place'.

Purpose is to save search time and eliminate motion waste, through visual management; with search-free and count free arrangement.

Colour can be best visual aid – RYGB

R	**–**	**Red – Critical**
Y	**–**	**Yellow – Reorder**
G	**–**	**Green – Design**
B	**–**	**Blue – Excess**

Note – Mapping of RYGB to feature is purely illustrative.

In order to implement systematic arrangement, GSL need to consider and answer :

- Analyse status.
- Decide – Which things will belong where?
- Decide – How they should be put away?
- Get everybody to follow rules through indexing, labelling etc.

Expected benefits of set in order to GSL

a) Faster retrieval of things results in elimination of search time.

b) Opportunity to correct the abnormalities faster as visibility improve by system itself.

c) Space saving by systematic arrangement.

d) Efficiency of work improves as things are available when they are actually needed.

Thus, S can solve the specifically problem of non-accessibility of tools.

S3 – Shine

Ensure there must be cleanliness 'in and of' everything. Obviously, if there less number of items, then there is less to clean.

- Cleaning should be with meaning.
- Cleaning is inspection (from all aspects – front, rear, left right, top and bottom).

Shine will help GSL to keep things in order with regular cleaning and upkeep, so that maintenance become 'preventive function' rather corrective and any incident, likewise fire occurrence on assembly-line; must be avoided. This will ensure larger utility out of Machine and Plants which will increase replacement cycle and save investment by lowering down maintenance and replacement cost.

S4 – Standardization

Establishing the 'standards' and make 'operating procedure' to create consistency and ensure that all steps are performed correctly. There are;

- Fix responsibilities for implementing & evaluating system.
- Integrate these responsibilities into routine work.
- Check how well the system is working and sustaining itself.

In order to ensure TPM all 5S are essential, but standardisation is key, GSL is facing large set of problem in assembly of electronic cycles and reason being absence of SOPs. Hence, by establishing the standardised process GSL can identify Critical Success Factors (CSFs) and benchmark the Key Performance Indicator (KPIs) against each CSFs.

S5 – Sustain

In order to sustain with the established standard, it is required to do;

- Daily monitoring
- Improving ownership by allocating areas
- Using 'red tag campaign'
- Communicating visually through fixed point photography
- Structured communication
- Continuous training of all employees
- Periodic audits at all level
- Motivating staff through recognition

Since 5S is not a onetime exercise, it is continuous process, hence, it is essential to sustain the practices followed during earlier 5Ss. GSL witness the high attrition rateat top management level, hence, it is important that GSL must inculcate practice of 5S in the system and work culture and sustain them on continuous basis, irrespective ofattrition.

Sixth S is 'safety' which was added later on, in order to ensure safety while performing all the remaining 5S.

Further details can be tabled on requisition basis.

Closure of Report

Management Accountant
(For Management Accounting Division)
Gold Star Limited

Question 4 : [Question]

Topic : Performance Measurement

History :

In 2009, Luxo had monopoly in the eyewear market of America, but the problem with the company was that it was selling variety of eyewear, by putting a big price on it. At present, there is almost nothing that you can't buy online, but at that time there were limited things that you could order online. In 2009, Arby Signer Inc. launched a website to sell eyeglasses online. Selling eyewear online and competing with Luxo was a challenge for Arby. Within just 4 years Arby break the monopoly of Luxo and capture he major market of America. People find it really convenient to buy sunglasses and glasses online and get delivery at doorstep. Following the footstep of Luxo, Arby eliminated the middleman from the manufacturing process, launched its own optical lab to have its own manufacturing process. The range of products/services offered by Arby which make different from Luxo include easy buying process, delivery at door step, stylish glasses, customize eyewear glasses, products was sold on the site at very affordable, with a starting range of just $95 etc.

Mission, Vision & Objectives

Mission	"Improving people's lives with our health care products in a socially cognizant way"
Vision	"To be a trusted health care partner"
Objective	"To offer people designer eyewear at a revolutionary price"

As a mission- based brand, Arby needed a way to instill their team of employees with a passion for the mission. Arby let their employee know 'what they value' and 'what the employee should value' in 'who they are'. This is important to setting up 'what they do'and 'why they do it' as a core foundation of their brand story. Arby also contributes in the philanthropic work, it inspires the people with its mission. For every pair of glasses customer pay, Arby donates a pair of glasses to needy person. In December 2019, Arby reported the donation of 9,60,000 pairs of eyeglasses. The company also claims to be 90% carbon neutral.

Extracts from the Balanced Scorecard

Performance Measure	2019 Actual	2019 Target
Financial perspective		
Return on capital employed (ROCE)	13%	14%
Net income	$95 Millions	$89 Millions

Customer perspective		
Number of first-time buyers	1,20,000	1,00,000
Customer retention ratio	78%	75%
Number of complaints (per 1,000 customers)	1.5	2
Number of glasses donated to needy people	9,60,000	9,00,000
Internal processes		
Number of business processes re-engineered	110	100
Number of new services made available through online application	2	4
Incidences of fraud on customers' accounts (per 1,000 customers)	3	10
Total CO2 emissions (tons)	850	1,100
Learning and growth		
Number of employees trained to instruct retailers	1,000 1,050	
Number of hours (paid for) used to support social plans	10,200	10,000
Number of trainee positions from rural areas	189	200

Other Information

Arby Signer has recently invested heavily in IT security to prevent fraud.

Required :

EXAMINE the performance of The Arby Signer in 2019.

Answer 4 :

The balanced scorecard approach looks both financial performance and non-financial performance. In order to gain competitive advantage, organizations have to be conscious of the needs and convenience of their customers. The Arby signer has a vision and strategy which goes far beyond just making money. They want to help the community and give something back to customers also. Hence, performance measures which address whether the Arby is being successful in pursuing their vision has been incorporated in Balanced Scorecard. The performance of the Arby will be considered under each of the titles used in the balanced scorecard:

Financial Perspective

The Arby has had a year of diverse achievements when looking at the extent to which it has met its financial targets. Its ROCE shows how efficiently it has used its assets to generate profit for the business. The target of ROCE for the year was 14% but it has only achieved 13% return. The Arby's Net Income, however, was in fact $6 million higher than its target, which is good. The most likely reason for the under target ROCE is possibly the investment which Arby has made in IT security. Whilst this may have reduced ROCE, this investment is essentially a good idea as it helps Arby to pursue its mission and will keep customers happy.

Customer Perspective

Regarding its customers, Arby's performance is better in the current year. It has not just exceeded its target sale to first time buyers by 20,000 but also improved its customer retention ratio, which is good for company to pursue its vision of being a trusted healthcare partner.

Customers complaints has reduced from 2 complaints to 1.5 complaints for every 1,000 customers, the exact reason is not clear but it might be because of improved processes and team efforts of employees.

Also, the number of glasses donated exceeded the target. It shows that company has exceeded its target of helping people which is good for the company's reputation.

Internal Processes

Number of business processes within Arby re-engineered has exceeded the target, which is very good and the impact of which may be reflected in the lowering of level of customer complaints. Likewise, the investment to improve IT security has been a great success, with only three incidences of fraud per 1,000 customers reported compared to the target of 10. However, only two new services have been made available via online application, instead of the target of four, which is unsatisfactory. But fortunately, its CO2 emission is below to the target level.

Learning and Growth

The Arby has succeeded to train its employees to instruct retailers. However, thenumber of employees trained to instruct retailers are comparatively lesser thantargeted, shortfall in training of employees to give instruction to retailers may have an impact on the Arby's failure to meet its target of market expansion.

Number of hours (paid for) used to support social plans are comparatively higher, itresults in additional costs which could have contributed to the fact that the Arby did not quite meet its target for ROCE. Further, company has not met aim for helping the rural area as targeted. This may be because the number of candidates applying from these areas was not as high as planned and this situation is beyond companies control.

In general, the Arby Signer had a successful year, meeting many of its targets.

Question 5 : [Question]

Topic : Gain Sharing Arrangements

Spicy is one of the top Engineering coaching institute, it operates a chain of 157 centres across the country of Mayaland. Spicy is equipped with the team of top most faculties for preparation of JEE who are known for giving best results year after year.

Students willing to join Spicy have to appear for admission test/(s). These tests help the students in understanding their potential and also provide them with the opportunity for scholarships that help them rewards academically and monetarily. In addition, Spicy provides comfortable class rooms, libraries, and ambience for overall development of students. Spicy delivers quality coaching for JEE by providing innovative ways and therefore prepares students for all challenges. Spicy prides itself on their results and level of educational service it offers to its students.

It has previously been successful in attracting students across the nation. However, in recent years, the number of enrolment of students has started to decline as a result of introduction of online platform. Several recent surveys have painted a disappointing picture for market conditions in 2020. A survey by the "My Education Outlook" over the month to 31st December found that only one in five respondents believes their business will be better off in 2020 compared with 2019. Spicy has a policy to set the standard fees based on the location of a particular coaching centre. It also takes into account fees charged by the competitors. However, the institute's managers have the right to offer discount to underprivileged students or scholarship to merit students, and to reduce fees structure when student hiring ratio (SHR) in their class rooms are expected to be low. The average standard fees per student, across all the centers of institute, was M$ 15,000 in 2019, compared to M$12,000 in 2018.

Spicy also generates revenue from the additional services available to students, such as selling books, providing test series etc. The series of periodic tests are identical to the pattern of various competitive engineering examinations and give sufficient practice to the aspirants for the same. Every test attempted by the students gives them a clear idea of their understanding of the concept, timeliness, strengths, weaknesses, and ranking amongst the aspirants across Mayaland.

Summary from Spicy's Management Accounts

Particulars	Year ended 31 Dec. 2019 M$'000	Year ended 31 Dec. 2018 M$'000
Gross Fees	1,11,980	1,05,977
Less: Fees Discount/Scholarship	(18,783)	(13,900)
Net Fees	93,197	92,077
Add: Other Revenue (selling books, tests etc.)	27,250	25,895
Total Revenue	120,447	117,972
Less: Operating Costs	(97,685)	(93,758)
Operating Profit	22,762	24,214
Other Performance Information	Year ended 31 Dec. 2019	Year ended 31 Dec. 2018
Capital Employed	M$ 3,77,50,000	M$ 3,77,10,000
Average SHR	78%	73%
Average SSR (Students Satisfaction Rating)	8	9.5

At the end of the course, or at the end of the unit within the course, students are asked to complete a questionnaire rating based on a scale of 1–10 where '10' represents Excellent' with various aspects of course, for example, the knowledge level of faculty, the quality of support material, and the approachability of faculty to ask them questions.

Two issues are becoming increasingly frequent in the students' comments alongside the scores:

- Students complaint that faculties in the institute were full of attitude not taking the doubts of students, instead of encouraging students to solve their doubts in the class, they insulted the students who raise their doubt during class. So, their standard of education has not been as good as in previous sessions.
- Students in classes need special individual attention, there is need of smart classes, doubt solving sessions etc. to improve the result of students.

Spicy had planned to start a remedial programme for average students for all the centres at the beginning of 2018. However, this programme has been put on hold to reduce expenditure.

Required

ANALYZE Spicy's performance for the year ended 31 December 2019.

Answer 5 :

Performance of Spice for the year ended 31st March 2019

Revenue

Gross Fees of Spicy has increased by 5.66% in 2019, which reflects the higher SHR (78% vs. 73%) and the increase in average standard fees per student (M$ 15,000 vs. M$ 12,000 per student). However, this information is not enough to conclude how well institute have performed in the year to 2019.

Net Fees has only increased 1.22%, this reflects the significant 35.13% increase in the discounts or scholarships offered.

It is observed that even though % change in the SHR is +6.85% (from the budgeted level of 73% to 78%), revenue from fees, net of discount/ scholarship, only increased by 1.22%. This means that average fees collection per student in 2019 was lower than in 2018, despite the higher average standard rate (M$15,000 vs. M$12,000).

It is also important to mention that in tough market conditions, managers have managed SHR, higher than budgeted figure by offering/ awarding the discount or scholarship.

With the increase in SHR, one of the best possible benefit is that, even if students are paying less fees, they will generate additional revenue from sale of books and test series. For example, in the given case additional revenue has increased by approximately 5.23% from M$ 25,895 to M$27,250.

In total, revenue has increased 2.1% in 2019 vs. 2018.

Overall, given the tough market conditions, any increase in revenues can be viewed as positive, however, the revenue achieved from per student should be greater than the variable cost of providing it.

Operating Profit

Notwithstanding the increase in revenue, operating profits have fallen by M$ 14,52,000 (6.00%) between 2019 and 2018, due to a sizeable increase in operating costs. There is no detail about Spicy's operating costs, for example, the split between fixed and variable costs. However, in tough market conditions, cost control is likely to be very important. As such, increase in operating costs M$ 39,27,000 (4.19%) between 2018 and 2019 is potentially a cause for concern and the

reasons for the increase should be investigated. However, when looking to reduce costs, it will be very important to do so in a way which does not compromise student's satisfaction. More generally, Spicy needs to avoid cutting expenditure in areas which will have a detrimental impact on student satisfaction ratings, for example, not providing enough time by faculty to students for doubt solving.

The increase in costs has also led to a fall in operating profit margin. The margin falls from 18.36% to 16.35%. This reduced profitability is also reflected in the institute's return on capital employed which has fallen slightly from 64.21% to 60.30%. This suggests that the value which Spicy is generating from its assets is falling.

Students Satisfaction Rate (SSR)

Although the reduction in profitability should be a concern for Spicy, the reduction in student satisfaction rate should potentially be seen as a greater cause for concern. The rating suggests that, in the space of one year, it has lost 1.5 points in the scale of 1-10, being the top Engineering Coaching Institute, Spicy cannot afford to lose the points. Spicy Institute pride itself on their results and level of educational service it offers to its students. Both factors are important considerations for students when considering whether or not to join Spicy Institute.

Therefore, Spicy needs to ensure that student satisfaction levels are maintained as high as possible and it is also important to know that how its students feel about the services it offers.

Moreover, the decision to defer the remedial programme is likely to have a detrimental impact on the future performance.

Question 6 : [Questions]

Topic : Outsourcing Decision

Mount Sports Manufacturing Facilities (MSMF) deals in manufacturing of sports articles. Although MSMF is major market player but can capture the market further. Currently MSMF manufactures five types of badminton shuttle named as P-101, P-102, P103, P-104 and P-105. Production facilities are limiting factor at MSMF. Production and marginal cost data of these 5 products are specified in table below;

Particulars	P-101	P-102	P-103	P-104	P-105
Monthly production (in units)	1,000	1,200	2,000	3,000	1,500
Direct Material Cost (₹ per unit)	6	4	7	3	6
Direct Labour Cost (₹ per unit)	4	9	5	8	5
Variable Production Overhead (₹ per unit)	2	3	2	2	1

On drive to cost leadership strategy, MSMF is thinking to out-source some of the products. Shuttles can be sourced from a well-established company 'Protease' at the following prices. There is no tie-in between products, all products can outsource individually. These costs are on CIF basis :

Particulars	P-101	P-102	P-103	P-104	P-105
Outsourcing Cost/Buy in Cost (₹ per unit)	17	18	18	11	15

Company-wide fixed overheads are of ₹ 15 Lacs each year. Out of which ₹ 2,40,000 is directly attributable to the production of these 5 products on annual basis. This fixed overhead of ₹ 2,40,000 is evenly split across such 5 products and entirely avoidable. Till date company does not have experience to outsource any element of production.

Mr. Singh who is newly appointed management accountant, bring the huge experience to the organization on cost control and reduction techniques. While discussing the possibility of outsourcing with CFO, Mr. Singh explained the limitation of out-sourcing and also presents a white paper on gain sharing arrangement; which can be entered with supplier to whom outsourcing is considered.

CEO just entered into the office of CFO (where such discussion is ongoing) on verge of such discussion, but he heard about gain sharing arrangement and curious to know further about the same.

Required

CEO post presentation / discussion seeks report from Mr. Singh to RECOMMEND, the product(s) which should be outsourced. Report should also EXPLAIN gain sharing arrangement along with aspects that MSMF need to consider, ensuring success out of gain sharing arrangement as a part of out-sourcing contract with Protease.

Answer 6 :

Report to :

Office of CEO,
Mount Sports Manufacturing Facilities (MSMF),
Dated – 03rd Jan 2020
Report on Outsourcing of Products to Protease

(i) Recommendation on out-sourcing of the products – Product P-102 and P-104 can be out-sourced. (see computations below)

Particulars	P-101	P-102	P-103	P-104	P-105
a. Monthly production (in units)	1,000	1,200	2,000	3,000	1,500
b. Direct Material Cost (₹ per unit)	6	4	7	3	6
c. Direct Labour Cost (₹ per unit)	4	9	5	8	5
d. Variable Production Overhead (₹ per unit)	2	3	2	2	1
e. Marginal Cost (₹ per unit) …(b)+(c)+(d)	12	16	14	13	12
f. Monthly Total Variable Cost …(e)×(a)	12,000	19,200	28,000	39,000	18,000
g. Monthly Allocable Fixed Overhead*	4,000	4,000	4,000	4,000	4,000
h. Total Monthly Cost Production-in-house …(f)+(g)	16,000	23,200	32,000	43,000	22,000
i. Outsourcing Cost Cost(₹ per unit)	17	18	18	11	15
j. Total Monthly cost of outsourcing (i)×(a)	17,000	21,600	36,000	33,000	22,500

Total monthly cost of in house production is ₹ 1,36,200 and Total comparable monthly cost of outsourcing is ₹ 1,30,100. There is overall saving of ₹ 6,100, but since there is no tie-in between products, hence decision on all products whether can be outsourced or produced in-house can be taken individually.

The above calculation suggests that only P-102 and P-104 can be sourced through outsourcing due to, whereas P-101, P-103 and P-105 can be produced more cheaply in-house.

(*) Since avoidable in nature, hence relevant for decision making. ₹ 2,40,000 is annual cost, hence monthly fixed overhead expenditure will be ₹ 20,000, which is allocated to the products equally.

However, following aspects needs to be kept in mind, prior to entering to out-sourcing arrangement of product P-102 and P-104

Issue 1

If products P-102 and P-104 are outsourced, the company would then have spare capacity. Since the production function/capacity is a limiting factor and there is scope of selling the further units of P-101, P-103 and P-105; in order to acquire the market share. Hence, spare capacity is of great importance and will be a powerful argument for outsourcing.

Issue 2

The reaction of the workforce at MSMF is also need to be considered because of two reasons;

a. If production of P-101, P-103 and P-105 cannot be expanded to take up the spare capacity on account of out-sourcing of P-102 and P-104, then lay-off may be required – Which may cause problem like strike by remain workforce or an industrial dispute.

b. Facts also suggest that products P-102 and P-104 are labour intensive (due to high comparative high labour cost). Hence, even the spare capacity on account of out-sourcing of P-102 and P-104 is used, and then also the some of labour forces need to be retrenched.

Issue 3

Even if lay-off is accepted by workforce, then also cost associated with redundancies may be critical. Such cost is relevant for decision-making, hence should be considered.

Issue 4

Since the MSMF has no experience in the outsourcing till now, hence while dealing with Protease, MSMF need to ensure;

a. Timely delivery in right quantity

b. Quality of supplies

c. Penalties in case of default

(ii) Gain Sharing Arrangement by MSMF as part of outsourcing agreement with Protease Gain Sharing Arrangement is a contractual arrangement where, entity (MSMF) &outsourcing supplier (In this case protease) share the financial gain which result out of either productivity gains or increased efficiency at end of outsourcing supplier from continuous improvement, transformation, or innovation.

This arrangement in form of clause is usually included in Master Agreement of outsourcing. Outsource supplier find it unique selling point and entity is also on for continuous improvement apart this both will get share in cost saved.

Although gain sharing arrangement is largely useful in case of outsourcing services agreement, but MSMF can also while entering out-sourcing contract with Protease for P-102 and P-104; but following aspects need to be considered;

Reason of failure of Gain Sharing Arrangement - Gain Sharing Arrangement sounds great but in practice it is quite difficult to execute. Even after a considerable level of efforts due to following reasons it may fail;

a. Unstructured/Poorly structured terms of arrangement, in outsourcing contracts.
b. Error in implementation.
c. Relationship between outsource supplier and entity.

Precaution need to be taken - Action plan for executing gain share arrangement must contain :

a. Be specific in outsourcing agreement.
b. Predefined formula for sharing of benefits and period thereof.
c. Effort from entity, because innovation is not only responsibility of outsource supplier.
d. Constitute innovation team to create an innovation structure, generate the idea and execution of same.

Overall

In consideration of above analysis, company should consider the outsourcing of P-102 and P-104 by entering out-sourcing contract with Protease. At this point, it is important to note that cost analysis emphasizes purely quantitative, financial considerations.

However, outsourcing decisions are often influenced by qualitative factors, which are not directly affected in calculations. The impact of the same should also be taken into consideration. The issues suggested above are not exhaustive. Further, before opting gain sharing arrangement, the same should also be reviewed carefully from a business, legal, and tax perspective.

I hope this helps - if you need any further information, please let me know.

Closure of Report

Mr. Singh,
Management Accountant
(For Management Accounting Division)
Mount Sports Manufacturing Facilities (MSMF)

Question 7 : [Question]

Topic : Customer Relationship Management

Jawahar Stationary Mart (JSM) is located in centre of city "X" and popular for wide range of stationary products at competitive rate. Box files and cobra files are among the major product of JSM. JSM clients majorly, include medium and large corporate offices apart from reasonable base of retail clients. Mr. Ronit who done his masters in operations and marketing, recently join the family business (JSM). Mr. Ronit during first week itself, identify there are regular complaints from corporate clients regarding 'delivery of items, which are different from what is ordered' and 'for not meeting the requirements'. Mr. Ronit understands consumer behavior is very critical in nature, if understood well and used through-out the business operation; then can be key success factors. Hence with intent to establishing the integrated relations with customers at JSM, Mr. Ronit advise marketing team to start recording the date regarding customer in systemic manner and reporting of same.

Following is information regarding five major customers, who are regularly order printed cobra files (Product code – J-Cobra 10) from JSM.

Particulars	A	B	C	D	E
No. of units sold	6,000	8,000	10,000	7,000	8,000
Margin per unit	6	7. 5	7	8	10
No. of purchase order	10	30	25	20	10
No. of deliveries	3	4	6	4	5
Kilometers per delivery	100	185	50	250	50

Cost of processing the order is INRs 2,000 per order and cost of handling material is INR 0.15 per item, whereas transport cost is 3 per kilometer for delivery of goods. 3 rushed deliveries made to 'B', cost for rush delivery is INRs 800 per delivery.

Required :

(i) ANALYZE customer profitability for JSM.

(ii) EXPLAIN three fundamental aspects of CRM to facilitate building relationship with profitable customer/(s).

Answer 7 :

(i) Statement of the Customer Profitability at JSM :

Amount in INRs

Particulars	A	B	C	D	E
Margin (no. of units sold × margin per unit) …(A)	36,000	60,000	70,000	56,000	80,000
Customer Attributable Costs:					
Cost of Processing Purchase Orders (no. of purchase orders × cost of processing the order)	20,000	60,000	50,000	40,000	20,000
Product Handling Cost (no. of units sold × cost of handling per item)	900	1,200	1,500	1,050	1,200
Delivery Cost (no. of deliveries × km per delivery × cost per km)	900	2,220	900	3,000	750
Cost of Rush Deliveries (no. of rush deliveries × cost per rush delivery)	---	2,400	---	---	---
Total …(B)	21,800	65,820	52,400	44,050	21,950
Profit (or Loss) …(A) – (B)	14,200	– 5,820	17,600	11,950	58,050
Profit / Net Revenue (in % age)	39.44%	– 9.7%	25.14%	21.34%	72.56%

Analysis :

From above, it can be concluded that customer A, C, and D are less profitable than customer E; whereas customer B is causing losses. Customer B provides a positive operating margin but is unprofitable when customer attributable costs are considered. This is because customer B requires more sales orders than the other customers. In addition, the customer has rush delivery costs.

This analysis can make sense, if interpreted, considering the 'Pareto Analysis'. Pareto Analysis named after economist Vilfredo Pareto, who specifies that 80% of consequences come from 20% of the causes i.e. 20% of customer provide 80% of the profit.

Although here proportion of 80:20 don't hold truth, but for JSM; major portion of profit (around 60%) coming from customer E only, therefore, customer E is critical to JSM. Special attention can then be given to enhancing the relationships with the customer E to ensure that customer E cannot migrate to other competitors. In addition, greater emphasis can be given to attract new customers that have the same attributes as the most profitable customer E.

Further, there is no point in serving customer B, but instead of refusing to trade with customer B, if possible; it may be better to turn it into profitable customer. Customer B can be made profitable if action is taken to convince the customer B to place a smaller number of larger quantity orders and avoid rush deliveries. If customer B cannot be convinced to change its buying behavior, selling prices should be increased to cover the extra resources consumed.

(ii) Supply chain management is the technique to integrate the supplier, manufacturing, store, and distribution function efficiently; in order to procure, produce and distribute at/in right time, quantity and place respectively. For effective distribution, CRM can be enabling tool. CRM is an integrated approach to manage and coordinate customer interactions to identifying, acquiring, and retaining customers. CRM enables businesses to understand and retain customers (through better customer experience) apart from attracting new customer, in order to increase profitably and decrease customer management costs. CRM system, comprises following three fundamental aspects to facilitate building relationship with profitable customers –

- Operative CRM takes care of individual transactions and is used by operational team. Interactions by customers are kept in the data base and are used later by the service, sales, and marketing team for operational decisions. In JSM, the staff who is responsible to deal with customer must be given access to customer's details including all the information of activities performed earlier. This will enhance the JSMs' staff's efficiency to deal with customer-facing processes in a better way.
- Analytical CRM analyses the data created on the operational side of the CRM effort for evaluation and prediction of customer behavior. In JSM, analytical CRM can highlight the patterns in customers' behavior which will help sale team while pitching the product at JSM.
- Collaborative CRM ensures that information about customer must flow seamlessly throughout the supply chain, majorly distribution channel; in form of collaborative effort by all associated department of JSM to increase the quality of services provided to customers. Increase in utility at customer end will result in increased loyalty. Collaborative CRM comprises interactive technology like email, digital media to simplify the communications between customers and staff which would help in building relationships.

Question 8 : [Question]

Topic : Just in Time

Pearson Metal and Motor Works (PM2W) deals in manufacturing of the copper wired electronic motor, which is specifically designed. PM2W is thinking to shift from traditional system to JIT system as part of process innovation.

CEO among the other top bosses at PM2W are hopeful that implementation of JIT will not only improve value in value chain for end consumer, but also improve overall manufacturing cycle efficiency. JIT pre-implementation team was formed to evaluate the probabilities, which collects following actual and estimated data about process :

Activity Category	Traditional System (Actual)	JIT System (Estimated)
Inspection	40	30
Storage	80	20
Moving	20	10
Processing	60	40

All data in minutes

Further, PM2W decided to practice single piece flow under JIT. PM2W received an order which is due to manufacture and delivered for 10 such motors. Total available production time to produce what customer demands is 480 minutes out of which it normal practice that 30 minutes will be spent in shutdown and cleaning. CEO is also considering JIT purchase apart from JIT production.

Required :

(i) EXPLAIN just in time.

(ii) CALCULATE the 'takt time' and INTERPRET the results.

(iii) ADVISE whether company should shift to JIT.

Answer 8 :

(i) Just-in-time (JIT) is a collection of ideas that streamline a company's production process activities to such an extent that wastage of all kind viz., of time, material and labour systematically driven out of the process with single piece flow after considering takt time.

In JIT, production facility is required to be integrated with vendor system for signal (Kanban) based automatic supply which depends upon demand based consumption. Under JIT system of inventory storage cost is at lowest level due to direct issue of material to production department as and when required and resultantly less/no material lying over in store or production floor.

Prerequisite of JIT system is integration with vendor, if vendor is not integrated properly or less reliable, then situation of stock out can arise andwhich can result into loss of contribution. Multitasking by employee is another key feature of JIT, group of employees should be made based upon product instead based upon function. Hence, functional allocations of cost become less appropriate. Overall, JIT enhance the quality into the product by eliminating the waste and continuous improvement of productivity.

(ii) Takt Time is the maximum available time to meet the demands of the customer; this will help to decide the speed of / at manufacturing facility.

Takt time is the average time between the start of production of one unit and the start of production of the next unit, when these production starts are set to match the rate of customer demand.

$$\text{Takt Time} = \frac{\text{Available Production Time}}{\text{Total Quantity Required}}$$

Here,

Available Production Time is 'total available time for production' – 'planned downtime i.e. spent in shutdown and cleaning' i.e. 450 minutes = 480 minutes – 30 minutes.

Total Quantity Required is 10 units

$$\text{Takt Time} = \frac{450\,\text{minutes}}{10\,\text{units}} = 45\,\text{Minutes}$$

Note - Heijunka can be applied in order to reduce variation between 'Takt times' over the production.

Interpretation

Customer's demand is 10 units, to calculate the takt time, divide the available production time (in minutes) by the total quantity required. The takt time would be 45 minutes. This means that process must be set up to produce one unit for every 45 minutes throughout the time available. As order volume increases or decreases, takt time may be adjusted so that production and demand are synchronized.

(iii) Advise on Shifting to JIT

To evaluate how much of the old cycle time was spent in inventory, we need to know how organizations assess the efficiency of their manufacturing processes.

One commonly used measure is process cycle efficiency and to calculate the same every process is breakdown into combination of activities such as value added activities, non-value added activities and non-value added activities but strategic activities. In order to generate highest value to customer, only value added activities are included in process. But those non-value added activities, which are strategic in nature, also need to be part of process. Therefore, it may be possible that entire process is not efficient.

To measure efficiency of process, managers keep track of the relation between 'times taken by value added activities' in comparison 'total cycle time'. Such relation/ratio is processing cycle efficiency.

$$\text{Process Cycle Efficiency} = \frac{\text{Value Added Time}}{\text{Cycle Time}}$$

Processing time is considered as value added time; whereas time spend on inspection, storage and moving is non-value added time and included in cycle time. The higher the percentage, less the time (and costs) needs to be spent on non- value added activities such as moving and storing etc.

Computation of Processing Cycle Efficiency

Sr. No.	Activity Category	Traditional System (Actual)	JIT System (Estimated)
A.	Inspection	40	30
B.	Storage	80	20
C.	Moving	20	10
D.	Processing	60	40
E.	Value Added Time …(D)	60	40
F.	Cycle Time …(A)+(B)+(C)+(D)	200	100
G.	Process Cycle Efficiency (E)/ (F)×100	30%	40%

Of the 200 minutes required for manufacturing cycle under PM2W's traditional system, only 60 minutes were spent on actual processing. The other 140 minutes were spent on non-value added activities, such as inspection, storage, and moving.

The process cycle efficiency formula shows that processing time equaled to 30% of total cycle time. The cycle time is reduced substantially in the JIT system from 200 minutes to 100 minutes. In addition to this, the amount of time that used up in inventory i.e. non-value-added activities is also reduced. Therefore, process cycle efficiency has been increased from 30% to 40%. This

significant improvement in efficiency over the previous system comes from the implementation of JIT system.

Therefore, it is advantageous to shift to JIT system.

Question 9 : [Practical Question]

Topic : THEORY OF CONSTRAINTS

Z Plus Security (ZPS) manufactures surveillance camera equipment .....

Note : It is exactly the same question, which we have covered in the classroom. It is covered in Volume I notes of Version 3. It is exactly the same question as Q.16 from Page 46. Hence, it is deleted from here to avoid duplication of work.

Question 10 : [Practical Question]

Topic : STANDARD COSTING

KONY Ltd., based in Kuala Lumpur, is the Malaysian subsidiary of Japan's NY corporation, headquartered in Tokyo .....

Note : It is exactly the same question, which we have covered in the classroom. It is covered in Volume II notes of Version 3. It is exactly the same question as Q.49 from Page 225. Hence, it is deleted from here to avoid duplication of work.

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5 Additional Questions from ICAI Website

Additional Questions

During 1st May, 2019 to 30th April, 2020, there were 3 additional questions uploaded by ICAI on its website. These are given below with answers :

Question 1 : (Uploaded by ICAI in October, 2019)

JPY Limited produces a single product. It has recently automated part of its manufacturing plant and adopted Total Quality Management (TQM) and Just-in-Time manufacturing system. No inventories are held for material as well as for finished product. The company currently uses standard absorption costing system. Following are related to fourth quarter of 2018-19 :

Particulars	Budget	Actual
Production and Sales	1,00,000 units	1,10,000 units
Direct Materials	2,00,000 kg. @ ₹ 30/kg.	2,50,000 kg. @ ₹ 31.20/kg.
Direct Labour Hours	25,000 hrs @ ₹ 300/hr.	23,000 hrs. @ ₹ 300/hr.
Fixed Production Overhead	₹ 3,20,000	₹ 3,60,000

Production overheads are absorbed on the basis of direct labour hours.

The CEO intends to introduce activity based costing system along with TQM and JIT for better cost management. A committee has been formed for this purpose. The committee has further analysed and classified production overhead of fourth quarter as follows :

Particulars	Budget	Actual
Costs :		
Material Handling	₹ 96,000	₹ 1,24,000
Set Up	₹ 2,24,000	₹ 2,36,000
Activity :		
Material Handling (orders executed)	8,000	8,500
Set Up (production runs)	2,000	2,100

Revision of standards relating to fourth quarter were made as below :

Particulars	Original Standard	Revised Standard
Material content per unit	2 kg.	2.25 kg.
Cost of Material	₹ 30 per kg.	₹ 31 per kg.
Direct Labour Time per unit	15 minutes	12 minutes

Required :

(i) CALCULATE Planning and Operational Variances relating to material price, material usage, labour efficiency, and labour rate.

(ii) CALCULATE overhead expenditure and efficiency variance using Activity Based Costing principles.

Solution 1 :

Hint : Use Circular Tally Technique to design formulae.

(i) Workings :

Cost Factor	Original Standards (ex-ante)	Revised Standards (ex-post)	Actual (1,10,000 units)
Material - Usage (kg.)	1,10,000 units x 2 = 2,20,000 kg.	1,10,000 units x 2.25 = 2,47,500 kg.	2,50,000 kg.
Material - Price (₹)	₹ 30/kg.	₹ 31 per kg.	₹ 31.20/kg.
Labour - Hours	1,10,000 x 15/60 = 27,500 hours	1,10,000 x 12/60 = 22,000 hours	23,000 hours
Labour - Rate/Hr. (₹)	₹ 300	No change	₹ 300

Material Cost Variances :

Traditional Variances

Total Cost Variance	=	(SQ x SP) - (AQ x AP)
	=	(2,20,000 x 30) - (2,50,000 x 31.20)
	=	66,00,000 - 78,00,000
	=	₹ 12,00,000 (A)
Price Variance	=	AQ x (SP - AP)
	=	2,50,000 kg. x (₹ 30.00 – ₹ 31.20)
	=	₹ 3,00,000 (A)
Usage Variance	=	SP x (SQ - AQ)
	=	₹ 30 x (2,20,000 kg. – 2,50,000 kg.)
	=	₹ 9,00,000 (A)

Planning Variances

Usage Variance	=	SP x (SQ - Revised SQ)
	=	₹ 30 x (2,20,000 kg. – 2,47,500 kg.)
	=	₹ 8,25,000 (A)
Price Variance	=	Revised SQ x (SP - Revised SP)
	=	2,47,500 kg. x (₹ 30 – ₹ 31)
	=	₹ 2,47,500 (A)
Total Planning Variance	=	₹ 8,25,000 (A) + ₹ 2,47,500 (A)
	=	₹ 10,72,500 (A)

Operational Variances

Usage Variance	=	Revised SP x (Revised SQ - AQ)
	=	₹ 31 x (2,47,500 kg. – 2,50,000 kg.)
	=	₹ 77,500 (A)
Price Variance	=	AQ x (Revised SP - AP)
	=	2,50,000 kg. x (₹ 31 – ₹ 31.20)
	=	₹ 50,000 (A)
Total Operational Variance	=	₹ 77,500 (A) + ₹ 50,000 (A)
	=	₹ 1,27,500 (A)
Cross Tally : Total Cost Variance	=	Total Planning Var. + Total Operational Var.
	=	₹ 10,72,500 (A) + ₹ 1,27,500 (A)
	=	₹ 12,00,000 (A)

Labour Cost Variances :

Traditional Variances

Total Cost Variance	=	(SH x SR) - (AH x AR)
	=	(27,500 hrs. x ₹ 300) - (23,000 hrs. x ₹ 300)
	=	₹ 13,50,000 (F)
Rate Variance	=	AH x (SR - AR)
	=	23,000 hrs. x (₹ 300 – ₹ 300) = NIL
Efficiency Variance	=	SR x (SH - AH)
	=	₹ 300 x (27,500 hrs. – 23,000 hrs.)
	=	₹ 13,50,000 (F)

Planning Variances

Efficiency Variance	=	SR x (SH - Revised SH)
	=	₹ 300 x (27,500 hrs. – 22,000 hrs.)
	=	₹ 16,50,000 (F)
Rate Variance	=	NIL. Not Applicable. No Revision in Rate
Total Planning Variance	=	₹ 16,50,000 (F) + NIL
	=	₹ 16,50,000 (F)

Operational Variances

Efficiency Variance	=	SR x (Revised SH - AH)
	=	₹ 300 x (22,000 hrs. – 23,000 hrs.)
	=	₹ 3,00,000 (A)
Rate Variance	=	AH x (SR - AR)
	=	23,000 hrs. x (₹ 300 – ₹ 300) = NIL
Total Operational Variance	=	₹ 3,00,000 (A) + NIL
	=	₹ 3,00,000 (A)

Overhead Variances using Activity Based Principles :

(ii) Material Handling Activity

Expenditure Variance	=	(Actual Activities x Std. Activity Cost Driver Rate) - Actual Overhead Cost
	=	(8,500 orders x ₹ 12) - ₹ 1,24,000
	=	₹ 1,02,000 - ₹ 1,24,000 = ₹ 22,000 (A)
Std. Activity Cost Driver Rate	=	Budgeted Cost / Budgeted Activities
	=	₹ 96,000 / 8,000 orders = ₹ 12 per order
Efficiency Variance	=	Std. Rate x (Std. No. of Activities required for actual output - Actual No. of Activities)
	=	₹ 12 x [8,800 - 8,500 orders]
	=	₹ 3,600 (F)

Std. No. of Activities required for actual output = $\left(\frac{\text{8,000 orders}}{\text{1,00,000 units}}\right)$ x 1,10,000 units

Set Up Activity :

Expenditure Variance	=	(Actual Activities x Std. Activity Cost Driver Rate) - Actual Overhead Cost
	=	(2,100 set up x ₹ 112) - ₹ 2,36,000
	=	₹ 2,35,200 - ₹ 2,36,000 = ₹ 800 (A)
Std. Activity Cost Driver Rate	=	Budgeted Cost / Budgeted Activities
	=	₹ 2,24,000 / 2,000 set up = ₹ 112 per set up
Efficiency Variance	=	Std. Rate x (Std. No. of Activities required for actual output - Actual No. of Activities)
	=	₹ 112 x [2,200 - 2,100 set up]
	=	₹ 11,200 (F)

Std. No. of Activities required for actual output = $\left(\frac{\text{2,000 runs}}{\text{1,00,000 units}}\right)$ x 1,10,000 units

Question 2 : (Uploaded by ICAI in October, 2019)

Aquatic Feed (AF) is the leading manufacturer of fish and other sea animal feed. AF has made its credit pioneering effort and service for over one decade in development of culture, processing and exports with its state-of-art fish feed and processing plants. Hallmark of AF is constant upgradation of aquaculture technology bringing latest developments in the field to the doorstep of the Indian aquaculture farmer. It stands as a leading provider of high quality feed, best technical support to the farmer and caters to the quality standards of global customers.

One of its fish feed product is "B" which is produced by mixing and heating three ingredients : B_1, B_2 and B_3. It uses a standard costing system to monitor its costs. The standard material cost for 100 kg. of "B" is as follows:

Ingredients	Standard Qty. (kg.)	Cost per kg. (₹)	Cost per 100 kg. of "B" (₹)
B_1	42	3	126
B_2	62	6	372
B_3	21	2	42
Totals	125		540

Notes :

- B_1, B_2 and B_3 are agricultural products. Their quality and price changes significantly every year. Standard prices are determined at the average market price over the last three years. AF has a purchasing manager responsible for purchasing and pricing.
- The standard mix is decided by the Managing Partner having 15 years' of rich experience in aquaculture field. The last time this was done at time of launching the "B" that was six years back. The standard mix has not been changed since.
- Mixing and heating process are subject to some evaporation loss.

In the current month 4,605 Kg. of "B" was produced, using the following ingredients :

Ingredients	Actual Qty. (Kg.)	Cost per Kg. (₹)	Total Cost of "B" (₹)
B_1	2,202	2.8	6,165.60
B_2	2,502	7	17,514
B_3	921	2	1,842
Totals	5,625		25,521.60

At every month end, the production manager receives a statement from the Managing Partner. This statement contains material price and usage variances for the month and no other feedback on the efficiency of the processes is provided.

Required :

EVALUATE the performance measurement system in AF.

Solution 2 :

Workings for Calculation of Variances :

Material Price Variance = AQ x (Std. Price - Actual Price)

Input	Actual Qty. (Kg.)	Std. Cost (₹)	Actual Cost (₹)	Price Variance (₹)
B_1	2,202	3	2.8	440.40 (F)
B_2	2,502	6	7	2,502.00 (A)
B_3	921	2	2	-
Totals	5,625			2,061.60 (A)

Material Usage Variance = SP x (SQ for actual output - AQ consumed)

Input	Std. Price (₹)	Calculation of Std. Qty.	Std. Qty. (Kg.)	Actual Qty. (Kg.)	Usage Variance (₹)
B_1	3	42/100 x 4605	1,934.10	2,202	803.70 (A)
B_2	6	62/100 x 4605	2,855.10	2,502	2,118.60 (F)
B_3	2	21/100 x 4605	967.05	921	92.10 (F)
Totals			5,756.25	5,625	1,407.00 (F)

Material Mix Variance = SP x (Std. Mix - Actual Mix)

Standard Mixing Proportion is = 42 : 62 : 21

Input	Std. Price (₹)	Calculation of Std. Mix	Std. Mix (Kg.)	Actual Mix (Kg.)	Mix Variance (₹)
B_1	3	5,625 x 42/125	1,890	2,202	936 (A)
B_2	6	5,625 x 62/125	2,790	2,502	1,728 (F)
B_3	2	5,625 x 21/125	945	921	48 (F)
Totals			5,625	5,625	840 (F)

Sub-Usage / Yield Variance = SP x (SQ - Std. Mix)

Input	Std. Price (₹)	Std. Qty. (Kg.)	Std. Mix (Kg.)	Variance (₹)
B_1	3	1,934.10	1,890	132.30 (F)
B_2	6	2,855.10	2,790	390.60 (F)
B_3	2	967.05	945	44.10 (F)
Totals		5,756.25	5,625	567.00 (F)

The statement reported, ₹ 2,061.60 adverse material price variance. The responsibility for controlling the materials price variance is usually with the purchasing manager. Undoubtedly, in current scenario, the price of materials is largely beyond his or her control; however, the price variance can be influenced by such factors as quality, quantity discounts, distance of supplier's location, and so on. These factors are often under the control of the purchasing manager. The production manager is responsible for usage variance and cannot be held responsible for the material price variance.

Since total usage variance reported is ₹ 1,407 favourable, production manager could assume good performance. However, if usage variance is considered in more detail, through the mix and sub-usage calculations, it can be observed that variance was driven by a change in the mix and by using a mix of ingredients which was different from standard. It has resulted in a saving of ₹ 840. Similarly, it has led to a favourable sub-usage variance of ₹ 567. It is worthwhile to note that change in material mix could impact the product quality and sales as well. However, no information has been given about this.

Prices and quality of three agriculture ingredients are changing significantly every year. Using ex ante prices and usage standards can provide an outdated view of variances. Failing to separate variances caused by uncontrollable factors and planning errors from variances caused by controllable factors can be demoralizing for the managers.

In addition, managers are not involved in setting the standard mix and the same has not been changed for six years despite continuous changes in the quality and prices of the ingredients. This can also mislead the managers i.e. to carryout control activities which are based on the outdated standards.

Furthermore, a true image is missing in relation to managers' performance as statement does not include any feedback or comments on the variances. Even no follow up is being taken on the same.

Overall, it appears that AF is not having comprehensive performance measurement system and this could adversely impact the firm in long run.

Question 3 : (Uploaded by ICAI in October, 2019)

Activity Based Cost Management

Melody is a manufacturer of musical instruments. The company specializes in manufacture of Piano and Electronic Keyboard instruments. They both are labour-intensive products. Therefore, Melody is following absorption costing for its production overheads based on direct labour hours.

Piano

Melody's Pianos are of very high quality. Client patronage include professional Piano musicians. Some of these instruments are sold in its standard form. However, musicians particularly the concert players require their pianos to be customized to certain specifications. Customization primarily relates to the acoustic quality of the piano sound. Quality of sound is of paramount importance to musicians as it determines the power and warmth of tone. Each musician has a preference to achieve a special quality of sound. Therefore, no two customized Pianos can be the same. Due to its reputation, Melody receives numerous requests for customization from its customers. Ability to provide customization service sets Melody apart from its competitors.

Customization requires the services of professional craftsmen. They are hired as subcontractors for such work based on the need. These craftsmen perform their services within the factory premises. For this, a special work space is maintained by Melody. Melody charges its customers extra for sub-contracting cost plus 10%. This would cover the actual cost of subcontracting and any incidental overheads incurred. The Board of Melody accepts that this method of billing is very simplistic. It is unsure if the company is recovering the entire cost of providing this customization service.

Electronic Keyboard Instruments

These instruments manufactured by Melody are home Keyboards that are targeted at young music enthusiasts who are beginning to learn music. They come in standard sizes, comprised of standard components. No customizations are done to Keyboards.

As a performance management expert, the Board wants your advice. The extract below provides the most recent management accounts for the Piano and Keyboard Division.

Figures in ₹

S.N.	Particulars	Piano	Keyboard	Total
1.	Number of items manufactured	1,000	10,000	
2.	Sale Price per unit	2,50,000	15,000	
3.	Revenue	25,00,00,000	15,00,00,000	40,00,00,000
4.	Materials	7,50,00,000	3,75,00,000	11,25,00,000
5.	Direct Labour	8,00,00,000	6,75,00,000	14,75,00,000
6.	Subcontracting Cost	3,75,00,000	-	3,75,00,000
7.	Production Overheads	4,50,00,000	65,00,000	5,15,00,000
8.	Total Cost of Production (4+5+6+7)	23,75,00,000	11,15,00,000	34,90,00,000
9.	Gross Profit (3 – 8)	1,25,00,000	3,85,00,000	5,10,00,000

Production Overheads

Figures in ₹

Particulars	Amount
Inspection and Testing	3,45,00,000
Space Maintenance Cost for Subcontracting Work (rent, utilities, 2 support staff to maintain storage)	50,00,000
Other Production Overheads (rest of the utilities, rent, salary of support staff at storage)	1,20,00,000

Required :

(i) DISCUSS the difference in treatment of production overheads under absorption costing and activity based costing.

(ii) LIST the steps to implement activity based costing within Melody.

(iii) ASSESS whether activity based costing would be suitable for the Piano and Keyboard Divisions.

(iv) ADVISE Melody about the activity based management and ways to improve business performance.

Solution 3 :

(i) Product cost under absorption costing method includes all manufacturing costs that are incurred to produce a product [i.e. direct material, direct labour and production overheads (both fixed and variable)]. The allocation of overheads is determined by a single cost driver based on volume of production (popular ones are machine hours or direct labour hours). This driver is applied to the entire production overhead to arrive at the production overhead rate. For example, in the given problem, labour hours are being used to allocate overheads to Pianos and Keyboards. All production overheads are allocated to products based on this driver irrespective of whether this resource was used by the product or not. For example, production overheads include **maintenance cost relating to space for subcontracting work.** This cost is incurred for the manufacture of Piano alone. This portion of the maintenance cost gets clubbed with other production costs. Eventually, an overhead absorption rate is calculated using the ratio of direct labour hours for each product. Absorption costing would ignore the fact that the manufacture of Keyboards does not utilize the space allocated for subcontracting work. This skews the product costing by erroneously inflating the cost of Keyboards, some portion of the cost of manufacturing Pianos passes onto the product costs for Keyboards. Application of a single cost driver may not be the most appropriate way of allocating costs between products. For example, in the given problem, **factory rent** is clubbed with total production overheads and applied to the product cost as part of the single overhead rate. Absorption costing ignores that direct labour may not be the most appropriate basis to allocate factory rent overhead to the products. Factory rent can be more appropriately allocated to the products on the basis of space occupied for manufacture by each product.

Activity based costing identifies the cost of each activity and assigns costs to units produced based on the number of activities used by each unit. Instead of being clubbed as a single overhead cost, costs for each activity captured in their respective cost pools. The most appropriate cost driver is selected for each cost pool and then the activity cost is charged to each product. Cost drivers could be volume based (machine hours / direct labour) or transaction based (# of purchase orders) or based on no. of batches (say set up cost) etc. This cost driver is used as the basis to allocate costs to various products based on the utilization of the resources related to that activity. Overhead costs are assumed to be variable, determined (or driven) by the selected cost driver. Here, the **cost of maintaining space for subcontracting** relates entirely to the manufacture of Pianos. Using ABC method, this cost will be allocated only to Piano products since allocation is now based on utilization of the resource to manufacture the product. Again, under this method, **factory rent** could have space utilization as the cost driver. Therefore, using ABC method, the allocation of production overhead to the products will be made on a more logical basis as compared to absorption costing.

To conclude, product costing using absorption costing is relatively simpler, a method regularly followed for financial accounting purposes. Product costing using ABC method results in more detailed yet accurate figures. It highlights the cost / benefit of various activities that helps management focus on eliminating non-value added activities.

(ii) Implementation of ABC Method within Melody would include the following steps :

Activity Mapping : Production process has to be first broken down into various activities. Based on their nature, activities must then be clubbed to form activity pools. Activity pools must then tie in with the products or services. Simply speaking, identify all activities carried out in the organisation.

Cost Pools : Overheads costs are then identified to each activity pools. This gives the cost pool for each category of activity.

Cost Driver : Identify the cost driver that bring about the cost. Cost driver is the factor which drives or influences the cost. For example, space utilization would be a cost driver for factory rent. Cost drivers could be volume based or transaction based.

Overhead Rate : Once the cost pool and cost drivers are identified, the cost per unit of cost driver (overhead recovery rate) is determined. It is popularly called as Activity Cost Driver Rate.

Overhead Cost Allocation : Depending on how much of the resources (i.e. cost drivers) the product utilizes, the cost is allocated accordingly to that product.

Product Cost : The allocated overhead cost is added to the cost of direct materials and labour to arrive at the full cost of production for the product.

(iii) Appropriateness of ABC Method for the Keyboard and Piano Divisions :

The Piano Division receives numerous requests for customization from its customers. While it produces only 1,000 Pianos in a year, no two customizations are the same. Therefore, the range of Pianos manufactured by Melody can be considered varied. Production overheads cost, including subcontracting work, form 35% of the total production cost [(₹ 3,75,00,000 + ₹ 4,50,00,000) / ₹ 23,75,00,000]. Therefore, **overheads form a substantial portion of product cost.** Due to the variety in customization, it is important to price each customization at a rate that will yield an acceptable profit margin to Melody. To do this, manufacturing process has to be segregated into various activities and cost pools. Depending on utilization of resources related to each activity, each Piano can be sold at an appropriate price. If a Piano requires more of a resource from an activity, this can be included in the product cost and factored into the selling price, such that even with customization an acceptable profit margin can be earned. Thus, ABC method can help Melody arrive at a more accurate cost of production as compared to traditional absorption costing.

While, overheads cost is one aspect of ABC analysis, the other information that an organization gets from this framework is that it can identify the activities that add value to the product. At the same time, non-value adding services can be identified (for example storage) and measures can be taken to minimize them. This will helps it to serve the customers better and will gain a competitive edge over others.

The Keyboard Division produces 10,000 Keyboards annually, all sold as a standard product with no customization. Activities are standardized, with no variation in the process between the Keyboards. Production overheads form only 5.83% of total cost of production. (₹ 65,00,000 / ₹ 11,15,00,000). Implementation of ABC method is time consuming and complex. Here, due to the standardized nature of production and low quantum of production overheads, ABC method may not be justified for the time and efforts involved. In this case, absorption costing may seem to be a more practical approach to arrive at product price.

(iv) Activity Based Management to help Melody improve business performance.

Activity based management can help Melody to meet the customer needs while using the lowest possible resource or cost. ABM can be used at an operational or strategic level.

Product Pricing

This would be especially in case of the Piano Division. As explained above, ABC method would enable Melody calculate a more accurate cost of production for each Piano. Currently, the **cost of subcontracting work** used for customized Pianos is ₹ 3,75,00,000. This is being charged to the customers with a 10% mark-up to cover for any

incidental overhead. However, this is very simplistic approach. As such the mark-up that can be earned under this method will be ₹ 37,50,000. However, the cost of maintenance of the area of subcontracting work itself is higher at ₹ 50,00,000. Therefore, it can be concluded that Melody is not recovering the entire portion of the incidental overheads incurred by providing the subcontracting work.

By identifying the cost pools relating to the subcontracting work, Piano Division can determine that it is making a loss on the subcontract work as a whole. It could therefore adjust the price of customized Pianos such that it earns an acceptable margin on each sale. This is at an operational level. At a strategic level, Melody can determine which type of customizations are most profitable. Customizations that are not very frequent, too complex, and costly may be avoided as it takes away resources from Melody in terms of labour, space etc. At the same time, careful consideration should be given to such decisions since it is this customization service that gives Melody an edge over other competitors. Therefore, Melody should take decisions that help it balance the customer base, while keeping the costs low and processes as standardized as possible.

Analysis of Activities

Implementation of ABC method forces the company to take a more detailed look at its activities that comprise of its manufacturing process. It may be found that certain activities can be performed in more efficient manner. Also, activities can be identified as that add value to the product and those that are not value adding. For example, in the given example, **storage** is not a value adding activity. Melody can work on a system where it optimizes the production process such that storage requirements are lower. The inventory turnover of Piano can also be improved, since quicker the Piano is shipped to the customer, lower the space requirement. **Inspection** is another non-value adding activity. For example, if Melody switches to a standardized procurement system for its raw materials from reputed suppliers, it can save on raw material inspection cost.

Performance Measurement

Employee resource should be used more towards value adding activities. Proper training would be required to ensure acceptable quality of work. This would automatically reduce non-value adding activities like rework, idle time, and inspection. There has to be a proper information system in place that captures such data. This is facilitated through the implementation of ABC costing method and use of ABM. However, to have a successful system, senior management need to be committed to this model, proper communication and training has to be given to employees. To implement such a performance system the management has to commit sufficient time and efforts. Cost benefit considerations of having such systems should also be taken into consideration. To conclude, implementing ABM should itself not consume much of the productive time of employees and become a non-value activity in itself. Hence, proper cost-benefit analysis should be done before implementing ABM.

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Additional Case Studies

During 1st May, 2019 to 30th April, 2020, there was only 1 additional case study uploaded by ICAI on its website. It is given below :

Supply Chain Management

Question 4 :

Memorable Travels is a tour operator offering holiday packages to a variety of customers. They advertise and promote their packages using print advertising in newspapers and colourful brochures. A basic holiday package would include transport from the city to the destination, stay, food, attractions, or activities. Memorable Travels has been in business for the past 15 years. It has standard agreements with its suppliers based on which it has been offering standard holiday packages to its customers. Profitable business over these years has resulted in surplus cash that the company intends to reinvest in its business. Recently, the management has noticed increase in the number of complaints regarding these packages. This has resulted in lesser number of customers opting for these tours.

A study of these complaints has indicated that customer expectations from a holiday trip vary depending on their age group. Accordingly, Memorable Travels wants to offer customized holiday package trips that would suit the travellers' expectations. It wants to increase the number of packages offered to customers in addition to adding variety to them. This would provide customers the choices from which they can customize their holidays with the help of Memorable Travels.

The management wants to understand the need and importance of supplier chain management in a service organization such as itself.

Required :

(i) DEFINE the objective of Memorable Travels should have when considers incorporating the supply chain management framework into its business model.

(ii) IDENTIFY possible components of Memorable Travels' upstream supply chain.

(iii) SUGGEST the key processes in the business model of Memorable Travels.

Solution 4 :

(i) Memorable Travels is providing a service wherein it uses its assets, staff, and resources to provide customized travel packages to its customers. It should consider how to utilize its assets and staff to design and manage its supply chain such that it meets the customers' demand in a cost-effective manner. Customers' demand is uncertain due to (a) customization of holiday packages to suit their individual expectations and (b) sensitivity of travel to factors like economic prosperity, law, and order etc.

Business processes must be effectively coordinated across organizations and functions to meet the customers' expectation in the best possible manner. The ability of Memorable Travels to respond to its customers' demand defines its operational capacity. Having more capacity (capability) to meet customers' demand helps it be more responsive and flexible. However, t his has to be balanced with its ability to maintain an effective supply chain management. A supply chain is effective only when Memorable Travels and consequently the ultimate customer, is able to get the required level of service from its suppliers.

(ii) As mentioned in the problem, a basic holiday package would include transport from the city to the destination, stay, food, attractions, or activities. Accordingly, possible components of Memorable Travels upstream supply chain would include partnerships with :

(i) Transport providers – road, rail, and air travel providers. This includes travel to the holiday destination as well as the local transport within that location.

(ii) Lodging and accommodation providers – hotels, bed, and breakfast providers etc.

(iii) Local food producers and restaurants.

(iv) Providers of tourist attractions and activities.

(iii) Key processes in the business model of Memorable Travels would be:

Information Flow

- ➔ Information flow is critical at various stages:
- ➔ to understand expectations of customers
- ➔ to share this information with the suppliers of service with whom Memorable Travels has partnership
- ➔ to establish clear service level agreements with these suppliers and to clearly define the scope of work
- ➔ to be able to monitor the performance of these suppliers. Performance has to be monitored because it will impact payment settlements with these suppliers
- ➔ to collect constructive feedback from customers about the performance of these suppliers

Capacity and Skills Management

Memorable Travels has to develop the ability to cater to various expectations of its customers. It has to develop assets and skilled staff who can attract customers and help them customize their holiday packages. To enable this, the company has to invest in its organization, processes, assets and staff. As mentioned above in point (a), information flow is a key process in this business model. The company has to invest in its processes to ensure that information flow is smooth and accurate. Similarly, it has to invest in assets like IT infrastructure, offices and also develop a skilled staff who can provide quality service. Memorable Travels should also have the ability to develop pool of suppliers who provide good quality service. Better capacity to cater to customers' demand better will ensure that Memorable Travel can develop and maintain its business efficiently. However, since building capacity and developing skills comes with a cost, that has to be balanced out with the revenue it generates.

Demand Management

Memorable Travels will have to focus on how to generate demand for its products. In tune with changing times, Memorable Travels will have to change its marketing from print based advertising to online advertising in order to have a larger outreach to attract customers. The company should be able to manage variation in customers' expectations in a cost- effective way. As explained in point (b) above, this will be determined by the capacity of its operations and skills of its employees. Higher the capacity more the flexibility in its operations.

Customer Relationship Management

Customer segmentation and monitoring help in understanding customer's needs in a better way and to focus on efforts to meet those needs through proper and timely communication of information with its service suppliers. However, the cost of maintaining this framework should not exceed the revenue that each customer segment generates. Accordingly, customer account profitability analysis should be prepared for each customer segment.

Supplier Relationship Management

As part of the customer relationship management, specific needs of customers would be identified. Based on these needs, potential suppliers who provide services of the requisite quality need to be identified. Service level agreements need to be drawn up after comprehensive rounds of negotiations. It is imperative to have a clear understanding with these suppliers regarding the quality service expected.

Service Delivery Management

Agreements with suppliers will help to ensure that expectations of customers of Memorable Travels are being met. Service performance must be monitored, checked continuously for compliance. Any deviation from scope may have an impact on the payment settlement to be made with the supplier.

Cash Flow

As mentioned above, service delivery should be monitored to ensure that payment is made only to the extent the agreed quality of service is delivered. Periodic payments to suppliers should be made based on service level agreements. Similarly, cash inflow from customers should be monitored to avoid any bad debts. Pricing for packages should be based on the level of service offered. Again, clear understanding of the terms of contract is essential to avoid uncertainties.

All processes within the company are linked to each other. Understanding the customers' expectations have a direct impact on the supply chain. Therefore, proper co-ordination is required for smooth functioning of the organization and its supply chain.

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Additional Case Scenario

During 1st May, 2019 to 30th April, 2020, there were no additional case scenario uploaded by ICAI on its website.

Mock Test Papers

During 1st May, 2019 to 30th April, 2020, ICAI uploaded only 1 Mock Test Paper with Solutions on its website. It is titled as October, 2019 Test Series.

However, after going through all the questions in the above mock test paper, I noticed that - most of the questions were borrowed either from Module or RTP or Exam Papers. There were only 3 new questions in it. Hence, to avoid the duplication of work, I have excluded the repeat questions and included only 3 new question here.

My general observation based on past experience is that the Mock Test Papers contain repeat questions and not the new questions. It is also observed that ICAI withdraws these Mock Test Papers from website, after some time.

Summary of October, 2019 Mock Test Paper

Q. No.	Reference of similar Question from our classroom notes from Version 3
1	Q.18 - Page 42 - Chapter 8 - Volume II - Version 3 Notes [Earlier Name : Grab & Go]
2	New Question - Answer is given below
3	Q.8 - Page 161 - Chapter 11 - Volume II - Version 3 Notes [Earlier Name : Great Bus Co.]
4(a)	Q.15 - Page 234 - Chapter 7 - Volume I - Version 3 Notes [Earlier Name : Sun Chemicals]
4(b)	Q.2 - Page 105 - Chapter 9 - Volume III - Version 3 Notes [Earlier Name : Global Multinational Ltd. (GML)]
5(a)	Q.31 - Page 168 - Chapter 6 - Volume I - Version 3 Notes [Earlier Name : JM Ltd.]
5(b)	Q.17 - Page 37 - Chapter 8 - Volume II - Version 3 Notes [Earlier Name : Same Name i.e. SBC LLP]
6(a)	New Question - Answer is given below
6(b)	New Question - Answer is given below

Question 2 :

X Technologies Ltd. develops cutting-edge innovations that are powering the next revolution in mobility and has nine tablet smart phone models currently in the market whose previous year financial data is given below :

Model	Sales (₹ '000)	Profit Volume Ratio
Tab - A001	5,100	3.53%
Tab - B002	3,000	23.00%
Tab - C003	2,100	14.29%
Tab - D004	1,800	14.17%
Tab - E005	1,050	41.43%
Tab - F006	750	26.00%
Tab - G007	450	26.67%
Tab - H008	225	6.67%
Tab - I009	75	60.00%

Required :

(i) Using the financial data, carry out a Pareto ANALYSIS (80/20 rule) of Sales and Contribution. **(8 Marks)**

(ii) DISCUSS your findings with appropriate RECOMMENDATIONS. **(12 Marks)**

Answer 2 :

(i) Pareto Analysis Based on Sales :

Fortunately the data given in the question is already arranged in the decreasing order of sales. That is from highest sales to lowest sale. We need to only calculate the % sales to total sales for each item and cumulative % sales to do Pareto analysis as follows :

Model	Sales (₹ '000)	% Sales	Cumulative % Sales
Tab - A001	5,100	35.05%	35.05%
Tab - B002	3,000	20.62%	55.67%
Tab - C003	2,100	14.43%	70.01%
Tab - D004	1,800	12.37%	82.47%
Tab - E005	1,050	7.22%	89.69%
Tab - F006	750	5.15%	94.84%
Tab - G007	450	3.09%	97.93%
Tab - H008	225	1.55%	99.48%
Tab - I009	75	0.52%	100.00%
Totals	14,550	100.00%	

Pareto Analysis Based on Contribution :

First we need to calculate contribution earned on each model of phone. It can be calculated as (Sales x PV Ratio) as follows :

Model	Sales (₹ '000)	Profit Volume Ratio	Contribution (₹ '000)
Tab - A001	5,100	3.53%	180.03
Tab - B002	3,000	23.00%	690.00
Tab - C003	2,100	14.29%	300.09
Tab - D004	1,800	14.17%	255.06
Tab - E005	1,050	41.43%	435.02
Tab - F006	750	26.00%	195.00
Tab - G007	450	26.67%	120.01
Tab - H008	225	6.67%	15.01
Tab - I009	75	60.00%	45.00

Now we need to re-arrange it in the decreasing order of contribution. That is from highest contribution to lowest contribution. Then we need to calculate the % contribution of each model to the total contribution earned on all the models. Thereafter we can calculate cumulative contribution % to do Pareto analysis as follows :

Model	Contribution (₹ '000)	Contribution %	Cumulative %
Tab - B002	690.00	30.87%	30.87%
Tab - E005	435.02	19.46%	50.33%
Tab - C003	300.09	13.43%	63.76%
Tab - D004	255.06	11.41%	75.17%
Tab - F006	195.00	8.72%	83.89%
Tab - A001	180.03	8.05%	91.94%
Tab - G007	120.01	5.37%	97.31%
Tab - I009	45.00	2.01%	99.32%
Tab - H008	15.01	0.68%	100.00%
Totals	2,235.22	100.00%	

(ii) Recommendations :

Pareto Analysis is a rule that recommends focus on most important aspects of the decision making in order to simplify the process of decision making. The very purpose of this analysis is to direct attention and efforts of management to the product or area where best returns can be achieved by taking appropriate actions.

Pareto Analysis is based on the 80/20 rule which implies that 20% of the products account for 80% of the revenue. But this is not a fixed percentage rule. In general business sense, it means that a few of the products, goods or customers may make up most of the value for the firm.

In present case, five models namely A001, B002, C003, D004 account for more than 80% of total sales where as more than 80% of the company's contribution is derived from five models B002, E005, C003, D004 and F006.

Models B002 and E005 together account for 50.33% of total contribution but having only 27.84% share in total sales. So, these two models are the key models and should be the top priority of management. Both C003 and D004 are among the models giving 80% of total contribution as well as 80% of total sales so; they can also be clubbed with B002 and E005 as key models. Management of the company should allocate maximum resources to these four models.

Model F006 features among the models giving 80%of total contribution with relatively lower share in total sales. Management should focus on its promotional activities.

Model A001 accounts for 35.05% of total sales with only 8.05% share in total contribution. Company should review its pricing structure to enhance its contribution.

Models G007, H008 and I009 have lower share in both total sales as well as contribution. Company can delegate the pricing decision of these models to the lower levels of management, thus freeing themselves to focus on the pricing decisions for key models.

Question 6(a) :

Following three independent situations pertaining to environmental management and sustainability are provided to you :

Situation I

Wasco Limited is a chemical company which uses chloro-fluorocarbons (CFC) in the production of chemical. As awareness of the environmental damage caused by CFC spread, Wasco Limited stopped using CFC in its production processes and analysed and redesigned its product range much before the legislation controlling use of CFC introduced by the Government.

Situation II

Energy drink manufacturer Cool Limited was ordered to submit a yearly report to the Ministry of Environment and Forests on activities, which contains information concerning collection, recovery and recycling of packaging waste, fulfillment of the targets, volume of recovered and recycled packaging waste by type of material and declaration that all compulsory contributions and taxes have been paid.

Situation III

KOA Limited has achieved a 25% reduction of energy consumption through its "Go Renewable" initiative. For the company, a 25% reduction represents a cost saving of about Rs. 30,00,000/-.

Required :

Read the above three situations and EXPLAIN **any 2** from (i), (ii) and (iii) below :

(i) Why Wasco Limited stopped using CFC and redesigned its product range much before legislation introduced by Government? **(5 Marks)**

(ii) The risk exposure of Cool Limited. **(5 Marks)**

(iii) How focusing on environmental sustainability provides opportunity to KOA Limited for reducing costs? **(5 Marks)**

Answer 6(a) :

(i) Ever increasing and demanding environmental regulation is forcing companies to change their practices. In many countries, numerous pieces of legislation cover areas such as air quality, climate change, hazardous substances, packaging, waste, and water quality.

The trend is very much in the direction of increased and more stringent legislation. Environment sustainability is not an issue that can be avoided by any organisation.

Organisations need to consider how environmental regulation will impact their operations and the cost of doing business.

By stopping the use of CFC much before the legislation, Wasco Limited gained advantages over its rivals. Wasco's actions were integral to its own strategic success, and instrumental in driving through the subsequent legislation from which the company will later get benefited.

(ii) Organizations increasingly have to demonstrate that they are managing all of their risks systematically and responsibly. This includes environmental risks. Risks that are a result of impacts of the organization on the environment. By assessing the environmental risks associated with their activities, processes, product, and services, organizations can identify their potential legal and business exposure. Non-compliances can cause enormous financial impacts, such as fines, penalties, legal costs, and damages.

Thus, Cool Ltd is exposed to environmental risks.

(iii) Focusing on environmental sustainability will often provide opportunities for reducing costs. For example, reducing carbon impacts often also saves energy costs. Similarly, programmes for reducing wastes improve environmental performance and reduce operating costs. KOA Ltd. has already achieved a cost saving of about Rs. 30,00,000 by reducing the energy consumption by 25%.

Reducing environmental impacts can also reduce or eliminate associated taxes, levies, and other compliance costs.

Focusing on environmental sustainability, thereby making investments in developing clean technologies and more energy-efficient products and processes will not only save the organization money, but could also be patented and / or sold to other organizations, providing an additional source of income. KOA Limited may have carbon credit for efficiency in reducing energy and sell on the open market, thereby actually generating revenue.

Question 6(b) :

LNG Limited has three divisions. Its desired rate of return is 14%. The operating assets and income for each division are as follows :

Divisions	Operating Assets (₹)	Operating Income (₹)
L	19,20,000	3,45,600
N	10,50,000	1,73,250
G	12,30,000	1,67,280
Total	42,00,000	6,86,130

LNG limited has Rs. 8,00,000 of additional cash to invest in one of its divisions. The divisional managers have identified investment opportunities that are expected to yield the following ROIs :

Divisions	Expected ROI for additional investment
L	16%
N	12%
G	15%

Required :

(i) CALCULATE ROIs at present for each division and STATE which division manager is currently providing the highest ROI. (3 Marks)

(ii) Based on ROI, IDENTIFY the division manager who would be the most eager to accept the additional investment funds. (1 Mark)

(iii) Based on ROI, IDENTIFY the division manager who would be least eager to accept the additional investment funds. (1 Mark)

(iv) STATE the division that offers the best investment opportunity for LNG limited. (1 Mark)

(v) DISCUSS the conflict between requirements (ii) and (iv) above. (2 Marks)

(vi) ADVISE how the residual income performance measure could be used to motivate the managers to act in the best interest of the company. (2 Marks)

Answer 6(b) :

(i) Calculation of present ROI :

ROI = Operating Income / Operating Assets x 100

Division	Operating Income	Operating Assets	ROI
L	3,45,600	19,20,000	18%
N	1,73,250	10,50,000	16.5%
G	1,67,280	12,30,000	13.6%

Presently, Division 'L' Manager is providing highest 18% ROI.

(ii) The manager of division G would be most eager to accept the additional fund of Rs. 8,00,000 because of ROI of the proposed investment of 15% is more than the present ROI of 13.6% and the acceptance of the proposal would increase the division's overall ROI.

For other two divisions, the expected ROI is lower than their present ROI.

(iii) The managers of division L and N, both would be reluctant to invest the additional fund of Rs. 8,00,000 because their return on the proposed project that is 16% and 12% respectively. It is lower than their existing ROI of 18% and 16.5% respectively. However, the manager of division N would be least likely to accept the additional investment because the gap in the present ROI and proposed ROI is highest 4.5%.

(iv) Division L offers the best investment opportunity of 16% for LNG limited for new investment. Because, 16% is the highest ROI on proposed investment.

(v) The managers are forced to choose between their personal best interests and the best interests of the company as a whole. When faced with decisions such as these, many managers choose to benefit themselves at the expense of their company, a condition described as sub optimisation.

(vi) To avoid sub optimisation, the divisional performance measure should be based on Residual Income (RI) method. If RI method is used to measure the performance, then the managers will be encouraged not only to act in their own best interests, but also to act in the best interests of the company. Since, the use of RI does not penalise investment in projects with lower returns than current project returns.

Residual Income (RI) = Operating Income - Expected cost of capital on investment

In general, when RI is used as a performance measure, managers are willing to invest in any projects with returns equal to or greater than the required rate of return. However, RI suffers from the disadvantages of being an absolute measure, which means that it is difficult to compare the performance of a division with that of other divisions of a different size.

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