www.CaRakeshAgrawal.in

CA FINAL – SCM & PE (New Syllabus)

Amendment Batch 4

(Notes for Private Circulation only)

-: INDEX :-

-: Compiled by :-

CA Rakesh Agrawal

[M.Com., Grad. CWA, FCA, SET, DISA]

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 cleard 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 the 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”.
- He enjoys teaching and he wants all of you to enjoy learning the subject also.

- He can be contacted at :
  Email : ngp.rakesh@gmail.com

Preface to Amendment Batch 4

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 at home.

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 **fourth** amendment batch notes. These amendment notes cover almost all changes which ICAI has introduced, up to 31st January, 2021. 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 student notes, if my opinion differs with ICAI opinion.

I hope you will get benefited with this 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

Email : ngp.rakesh@gmail.com

Website : www.CaRakeshAgrawal.in

Special Remarks for Amendment Batch 4 Notes

Dear Student Friends,

Generally, I come out with the amendment batch notes, once in a year. Actually, one year period is not yet over since the last amendment batch 3 notes are issued. The earlier amendment batch notes had covered changes up to 30th April, 2020 and I wanted to cover the changes up to 30th April, 2021 in this amendment batch.

However, students community lost their patience and felt that lot of time has passed between issue of previous amendment notes and this notes. The matter became more urgent because ICAI released a revised edition of SCM&PE module in November, 2020.

Please remember that there is a difference between **'Change in Syllabus**' and issue of **'Revised & Updated Module'**. The new module has made an effort to correct the errors of previous module and few new questions taken from RTP / MTP / Past Exam are added. That's all. I have already put a separate article on our website, which narrates the chapter wise change in it. I repeat, there is no change in syllabus except a small change in **OEE formula**, which is explained in these notes.

I could not cover the Suggested Answers of past examinations, because ICAI itself has not yet published it. I will have to go through it carefully to find the difference of opinion in my approach and ICAI approach, so as to minimise confusion in your mind.

I am releasing these amendment batch 4 notes, just due to urgency felt by the students community. I will have to revise it again to include suggested answers and other changes or additions made by ICAI up to 30th April, 2021. You may expect the revised edition of these amendment notes after ICAI comes out with the suggested answers of January, 2021 (extra) exam. Till that time, this copy will help you to gain some peace of mind.

Please note that, I have already incorporated all the changes till date in my new Regular Batch - Version 4. Hence, these notes are useful only for the students of my Regular Batch of Version 1, Version 2 and Version 3.

In lighter vein : The moment these notes are released on website, within a month, I will get a request from some of the students, for next amendment batch 5 notes. Some people feel that the subject of SCM&PE is just like GST, where you keep getting the frequent notifications from the Government.

Anyway... best wishes for your exams and hope to see you as 'CA' soon.

CA Rakesh Agrawal

Your friend in need

Suggested Answer of May 2020 Exam

I think in the history of ICAI, it might have happened for the first time, that ICAI made multiple attempts to conduct the May, 2020 exam; but Covid-19 failed all these attempts. ICAI officials might have experienced the fact of failure in an attempt and that too repetitively.

Friends, this exam was never conducted and hence there is no question of suggested answers. I have just made the reference here, because in future, students may forget the fact that this exam was never conducted as all and will assume that I have skipped it in my notes.

Suggested Answer of November 2020 Exam

Till the date these notes are uploaded on our website, ICAI has not yet released the suggested answer. Hence, the work from my side is also pending. I will do it after going through ICAI views and you will find it in my next revised notes. Till then, you can always visit ICAI website and download the soft copy, as and when it is made available for public.

Suggested Answer of January, 2021 Exam

This was the extra exam conducted by ICAI for those students who opted out from Nov. 2020 exam due to any reason. I am expecting the suggested answers of this exam from ICAI after one month from announcing the result of this exam. Once it is available, I will revised these amendment notes and you will find it on our website then. Till then, you can always visit ICAI website and download the soft copy, as and when it is made available for public.

* * * * *

Mock Test Papers (MTP)

During 1st May, 2020 to 30th April, 2021, ICAI uploaded only Two Mock Test Paper with Solutions on its website. It is titled as May, 2020 Test Series and October, 2020 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 few new questions in it. Hence, to avoid the duplication of work, I have excluded the repeat questions and included only new questions with answers 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 May, 2020 Mock Test Paper

MTP Q. No.	Reference of similar Question from our classroom notes
1	Q.8 - Page 84 - Chapter 3 - Volume I - Version 3 Notes [Earlier Name : ASPL]
2	Q.6 - Page 113 - Chapter 4 - Volume I - Version 3 Notes [Earlier Name : Storewell Industries Ltd.]
3	Q.2 - Page 6 - Chapter 8 - Volume II - Version 3 Notes [Earlier Name : BYD Alloy Ltd.]
4(a)	Q.56 - Page 195 - Chapter 6 - Volume I - Version 3 Notes [Earlier Name : Same]
4(b)	Q.4(b)–Nov. 2019 Exam – Amendment Batch 3 Notes – Page 41 [Earlier Name : Automation Ltd.]
4(c)	Q.8 - Page 118 - Chapter 10 - Volume II - Version 3 Notes [Earlier Name : XYZ Electronics Ltd.]
5(a)	Q.17 - Page 157 - Chapter 6 - Volume I - Version 3 Notes [Earlier Name : ABC Ltd.] – Similar with figures changed
5(b)	Q.7–RTP Nov. 2020 Exam. [Earlier Name : Same Name i.e. ZM Inc.]
6(a)	It is a New Question –It is covered below with answer
6(b)	Q.1 - Page 132 - Chapter 11 - Volume III - Version 3 Notes [Earlier Name : SPM]

Question 6(a) :

[Topic : Cost of Quality – Chapter 2]

The CEO of P Limited is concerned with the amounts of resources currently spent on customers warranty claims. Each box of its product is printed with the logo : "satisfaction guaranteed or your money back". P is having difficulty competing with X Limited because it does not have the reputation for high quality that X Limited enjoys. Since the warranty claims are so high, the CEO of P Limited would like to assess what costs are being incurred to ensure the quality of the product. Following information is collected from various departments within the company relating to 2018-19 :

Particulars	**Rs.**
Warranty claims	4,25,000
Employee training costs	1,20,000
Rework	3,00,000
Lost profits from lost customers due to impaired reputation	8,10,000
Cost of rejected units	50,000
Sales return processing	1,75,000
Testing	1,70,000

For the year 2019-20, the CEO is considering spending the following amounts on a new quality programme :

Particulars	**Rs.**
Inspect raw material	1,20,000
Reengineer the production process to improve product quality	7,50,000
Supplier screening and certification	30,000
Preventive maintenance on plant equipment	70,000

P expects the new quality programme to save costs by the following amounts :

Particulars	**Rs.**
Reduction in lost profits from lost sales due to impaired reputation	8,00,000
Reduction in rework costs	2,50,000
Reduction in warranty costs	3,25,000
Reduction in sales return processing	1,50,000

Required :

(i) Prepare a Cost of Quality Statement for the year 2018-19 showing the percentage of the total costs of quality incurred in each cost category. [3 Marks]

(ii) Prepare a cost benefit analysis of the new quality programme showing how the quality initiative will affect each cost category. [3 Marks]

(iii) State how the manager trade-off among the four categories of quality costs. [4 Marks]

Solution 6(a) :

(i) Cost of Quality Statement for 2018-19 :

Particulars	Rs.	% of total cost
Prevention Cost :		
Employee training costs	1,20,000	5.85%
Appraisal Cost :		
Testing	1,70,000	8.29%
Internal Failure Cost :		
Rework	3,00,000	
Cost of rejected units	50,000	
Sub-total	3,50,000	17.08%
External Failure Cost :		
Warranty claims	4,25,000	
Lost profits from lost customers due to impaired reputation	8,10,000	
Sales return processing	1,75,000	
Sub-total	14,10,000	68.78%
Total Cost of Quality	**20,50,000**	**100%**

(ii) Cost Benefit Analysis for 2019-20 :

Particulars	Addl. (Cost) / Savings	Net Effect (₹)
Prevention Cost :		
Reengineer the production process to improve product quality	(7,50,000)	
Supplier screening and certification	(30,000)	
Preventive maintenance on plant equipment	(70,000)	(8,50,000)
Appraisal Cost :		
Inspect raw material	(1,20,000)	(1,20,000)
Internal Failure Cost :		
Reduction in rework costs	2,50,000	2,50,000
External Failure Cost :		
Reduction in lost profits from lost sales due to impaired reputation	8,00,000	
Reduction in warranty costs	3,25,000	
Reduction in sales return processing	1,50,000	12,75,000
Net Savings from new quality programme		**5,55,000**

(iii) Managers Trade off :

Investment in prevention costs and appraisal costs (also known as costs of good quality), reduces internal and external failure costs (also known as cost of poor quality).

Costs incurred before actual production begins, to prevent defects and other product quality issues, are known as preventive costs. In the given example, reengineering production process, screening and certification of suppliers and preventive maintenance of equipment are prevention cots. Likewise, appraisal costs are incurred to ensure that activities conform to desired quality requirements. They are incurred in all stages of production. In the given example, inspection of raw material is an appraisal cost.

Trade off means cost-benefit analysis. A manager has to see how much extra cost he has to incur on Prevention and Appraisal and the resultant savings in Internal and External Failure costs. If the incremental benefit is more than the incremental costs, then it is advisable to implement the new proposal.

In the above example, the extra cost incurred on Prevention is Rs. 8,50,000 and extra cost incurred on Appraisal is Rs. 1,20,000. However, it has resulted in a saving of Rs. 2,50,000 in Internal Failure cost and a savings of Rs. 12,75,000 in the External Failure cost. Thus the net saving due to new quality programme is Rs. 5,55,000.

Hence, it is advisable to implement the new quality programme.

* * * * *

Summary of October, 2020 Mock Test Paper

MTP Q. No.	Reference of similar / same Question from our classroom notes
1	Q.7 - Page 11 - Chapter 2 - Volume III - Version 3 Notes [Earlier Name : Sun Electronics]
2	Q.2 - Page 113 - Amendment Batch 3 Notes [Earlier Name : X Technologies Ltd.]
3	It is a New Question. It is covered below with answer
4(a)(i)	It is a New Question. It is covered below with answer
4(a)(ii)	Q.56 - Page 195 - Chapter 6 - Volume I - Version 3 Notes [Earlier Name : 'S' manages school canteen] Optional Question Q.9. - Covered in RTP - Nov. 2020 - Olderhelp India
4(b)	Q.21 - Page 103 - Chapter 2 - Volume I - Version 3 Notes [Earlier Name : ABC miners]
5(a)	Q.10 - Page 36 - Chapter 6 - Volume I - Version 3 Notes [Earlier Name : Livewell Ltd.]
5(b)	Q.4 - Page 137 - Chapter 11 - Volume III - Version 3 Notes [Earlier Name : Excellent Woodcraft]
6(a)	Q.15 - Page 234 - Chapter 7 - Volume I - Version 3 Notes [Earlier Name : Sun Chemical Co.]
6(b)	Q.49 - Page 225 - Chapter 12 - Volume II - Version 3 Notes [Earlier Name : Kony Ltd.]

Question 3 :

[Topic : Building Block Model – Chapter 8]

The Soup Ltd. offers a range of beauty parlor services like hair care, body care, manicures / pedicures, skincare, etc. It has 150 centre/s across the country. The business of beauty parlor is extremely competitive in all region. Each centre operates autonomously and managers are able to offer customize services.

Soup's mission statement is "to inspire and enhance beauty by using knowledge and experience". To establish long term relationship of trust and commitment with clients, Soup wants to provide their client highest level of satisfaction with emphasis on :

- Service Customization
- Professionalism, Work, and Clinical Responsibility
- Client's Feedback

Company has developed a website where it creates blogs, post high quality content related to beauty tips. Website is also connected to social media to reach customers. If a customer searches Soup's services on search engine, it automatically redirects to the place of nearest service center. Soup's all services are presently booked through online channel.

Results for one of the center, "Roop", are given below. The column headed "Centre" shows the average figures for all Centre/s :

Particulars	Roop (Oct. 20)	Centre (Oct. 20)
Revenue (₹)	91,26,000	1,08,66,900
Gross Profit (₹)	48,50,400	51,37,740
Number of senior Beauticians	90	110
Number of junior Beauticians	60	55
Number of website hits	15,010	19,260
Total number of services booked online and completed	9,915	12,270
Number of services taken by repeat customers	1,510	1,605
Total time spent on completing jobs (hours)	24,120	25,880
Number of new service packages offered	3	2
Customer % in terms of feedback forms showing score of 9 or 10	86%	77%

Notes :

(1) Beauticians are categorized as 'senior' if they have been qualified for more than three years.

(2) 'Junior' Beauticians includes both trainee beauticians and beauticians who have been qualified for less than three years.

(3) The Roop launched three new service packs during the year :

- free coupon of worth ₹ 600 for services over and above ₹ 1,200
- a head massage costing only ₹ 240, instead of the usual ₹ 480, for 10 days advanced booking.

- for a haircut ₹ 120 will be charged, which usually costs ₹ 360, for all customers booking hair spa.

These three new service packs produced revenues of ₹ 7,92,000; ₹ 6,96,000 and ₹ 6,48,000 respectively. Two comparable new service packs developed by other centre/s produced revenues of ₹ 5,28,000 and ₹ 5,04,000.

(4) Customers to rate the particular centre from 1 to 10 in an online feedback form with 10 being the best.

The Chief Executive Officer (CEO) of Soup has recently attended a webinar and heard about Building Block Model of Performance Management. The CEO is interested to know how the dimensions block could be applied at Soup Ltd.

Required :

(i) Analyse Roop's performance relative to the other Centre/s. (12 Marks)

(ii) Explain how the Standards and Rewards blocks support the Dimensions block in case of Building Block Model. (8 Marks)

Solution 3 :

(i) Analysis :

Competitiveness

Particulars	Roop	Centre Average
Website hits converted into orders (in percentage)	66.06% (9,915/15,010)	63.71% (12,270/19,260)

This ratio shows whether Roop's services are attractive compared to its competitors, which is essential if it is going to persist in such a competitive market.

It has performed considerably better than Centre average, having converted 66.06% of website hits into jobs, compared to the 63.71% converted by other Centres. This is a good outcome.

Financial Performance

Particulars	Roop	Centre Average
Gross profit ratio (in percentage)	53.15% (48,50,400/91,26,000)	47.28% (51,37,740/1,08,66,900)

Gross profit ratio is a measure of financial performance. It indicates the percentage of revenue which exceeds the cost of goods sold.

Roop's gross profit ratio is 5.87% higher than the average, which is a good result. This could be because of new service pack sales. It is also likely to be because of ratio of senior beauticians to junior beauticians (1.5 times), which is lower than the average (2 times) and junior beauticians will invariably be paid less than senior ones.

Quality of Service

Particulars	Roop	Centre Average
Jobs from repeat customers (in percentage)	15.23% (1,510 / 9,915)	13.08% (1,605 / 12,270)

Quality is a key aspect of Roop's service to customers and if it is poor, customers will not return.

Again, Roop has surpassed the other centres on average by 2.15% points. Though, it has a lower ratio of senior beauticians to junior beauticians (1.5 times), than the average (2 times), it might be possible that Roop has a portfolio of enthusiastic staff. So, the quality of work is probably better, thus higher level of repeat customers.

Flexibility

Particulars	Roop	Centre Average
Time taken per job (in hours)	2.43 (24,120 / 9,915)	2.11 (25,880 / 12,270)

The comparison shows that Roop takes longer time to complete a job than the other center average, which is not really good and is probably because of they have slightly less experienced staff on the whole. However, it could also be that they do a more comprehensive job than other centers. Given the fact that they have a higher % of repeat customers than the other centers and they are also graded 9 or 10 by most of the customers (86%). Therefore, this cannot be viewed as too adversely.

Resource Utilisation

Particulars	Roop	Centre Average
Revenue per beautician (in rupees)	60,840 (91,26,000 / 150)	65,860 (1,08,66,900 / 165)

The crucial resource in a service company is its staff and so these indicators measure how this resource is being utilised.

Roop's utilisation of its staff is lower than that of the other centers by ₹ 5,020 per beautician. This clearly links in with the point that the average time to complete a job is longer at Roop than other centers. However, given that Roop uses a slightly less experienced staff than other centers and the fact that its gross margin is higher than the average, this should not be viewed too adversely.

Innovation

Particulars	Roop	Centre Average
Revenue generated from new service packs (in percentage)	23.4% [(7,92,000 + 6,96,000 + 6,48,000) / 91,26,000]	9.5% [(5,28,000 + 5,04,000) / 1,08,66,900]

Roop is offering a wide variety of service packs to its customers. The ratio of 23.4% indicates that Roop has really outperformed other centers on this front, generating a far larger part of its revenue by the introduction of new service packs, which must have attracted customers. This is a really good performance.

(ii) The **Standards** block fixes the target for the performance indicators chosen for each of the dimensions. The targets must meet three criteria i.e. they must be achievable, fair and encourage employees to take ownership. The performance of the organisation could suffer if the targets set do not meet these criteria.

The **rewards** block makes sure that employees are motivated to attain the standards. It also examines the properties of good reward schemes which are that they should be clear, motivating and based on controllable factors.

If standards and rewards are set appropriately, the staff will be engaged and motivated and it is then more likely that the goals, i.e. **dimensions** of the organisation will be achieved.

Question 4(a)(i) :

[Topic : JIT System – Chapter 3]

'M' is a leading manufacturing company. Under increasing pressure to reduce costs, to contain inventory and to improve service, M's Costing Department has recently undertaken a decision to implement a JIT system.

The management of 'M' is convinced of the benefits of their changes. But Supplies Manager Mr. Bee fears with the Costing Department's decision.

He said : "We've been driven by suppliers for years .... they would insist that we could only purchase in thousands, that we would have to wait weeks, or that they would only deliver on Mondays !"

Required :

Is Mr. Bee's view point correct? Comment. (5 Marks)

Solution 4(a)(i) :

JIT Inventory System

For successful operation of JIT inventory system, the suppliers chosen must be willing to make frequent deliveries in small lots. Rather than deliver a week's or a month's material at one time, suppliers must be willing to make deliveries several times a day and in the exact quantities specified by the buyer.

It is described in the problem that suppliers are not willing to make frequent deliveries and make supplies in the exact quantities as required.

Accordingly, Mr Bee's doubt is correct on successful implementation of JIT system.

* * * * *

RTP - November 2020

PAPER 5 : STRATEGIC COST MANAGEMENT AND PERFORMANCE EVALUATION

Question 1 : [Case Study]

Topic :Competitive Advantage

BA is the second largest airline in the Country "X". Aviation industry in the Country "X" is growing fast. In 2011, 45 million people travelled to/ from/ or within the Country "X". By 2020 that doubled to 100 million. This number is expected to treble to 300 million by 2030. Also, by 2025, Country "X" is expected to be the third largest air transport market in the world, behind the US and China.

Government is trying to meet the significant growth potential of aviation Industry. However, it will create challenges also for the airline industry and its industry partners.

Government also wants to ensure that broader business and policy environment should not place hurdles which inhibit growth and reduce the level of benefits that aviation can deliver to the nation. The industry, its supply chain partners, and the government and policy makers have a clear mandate to work in collaboration towards the common goal of ensuring that aviation's economic and social benefits are fulfilled.

Despite of operating in World's fastest growing market BA struggles for passengers. Also, BA is facing following problems :

- Aviation Turbine Fuel (ATF) prices constitute about 40% of operational costs in Country "X" and are taxed higher here than anywhere else in the World. The Central government charges 14% duty on ATF. While the state government pile on their own local tax that can go as high as 29%.

- The currency depreciation is hitting Airline harder. About 25% to 30% of their costs, excluding ATF, are dollar denominated, from aircraft lease rents, maintenance costs to ground handling and parking charges abroad etc.

- With the entry of Low Budget Carriers, full-service carrier like BA that have higher overhead costs have been forced to offer discount to passengers looking for great bargain.

- Continuous improvements in tourism infrastructure, tourism policies, human resource development, airport infrastructure density are among the areas that could further enhance Country X's competitiveness. Ease of doing business over the last five years has risen.

- The intense competition among domestic airlines carriers, the need to capture a slice of the ever-expanding market and passenger price sensitivity makes the airlines difficult to raise ticket prices.

Together, these factors have now plunged Country X's aviation industry to its most precarious phase in the last three years or so.

BA is facing huge competition as a "year of sharp U-turns" for X's aviation industry from record profit in Financial Year 2019-20 to mega losses, resulting in direct need of recapitalisation. BA has been appealing to the government for a decade for reduction in taxes on fuel, but all in vain. ATF is 35-40% more expensive in Country "X" than in the rest of the world, because of relatively high tax rates.

Required :

ADVISE the strategy that BA should follow in order to gain superior performance and competitive advantage over its competitors.

Answer 1 :

In consideration to Michael Porter's theory about creating a superior performance and competitive advantage, a firm's overall competitive advantage derives from the difference between the value it offers to customer and its cost of creating that customer value. In order to survive and prosper in industry, firm must meet two criteria – they must supply what customers want to buy and they must survive competition.

To attain superior performance and attain competitive advantage, firm must have distinctive competencies. Distinctive competencies can take any of the following two forms:

Relative low-cost advantage- under which customers gain when a firm's total costs undercut those of its average competitor.

An offering or differentiation advantage- If customer perceive a product or service as superior, they become more willing to pay a premium price relative to the price they will have to pay for competing offerings.

Low Cost Advantage (Cost Leadership)

BA can enjoy relative cost advantage if its total costs are lower than those of its competitors. This relative cost advantage enables a business to do one of the following:

- Charge a lower price than its competitors for its services to gain market share and still maintain current profitability; or

- Match with the price of competing services and increase its profitability.

Cost reductions in BA can be achieved through yield management with variable pricing depending on capacity utilization with careful monitoring; application of computer and communication technology in cost effective way i.e. selling seats via the internet rather than through travel agents; trimming overhead costs by using lower cost out-of-town airports, no printed tickets, seat allocations, or free meals and drinks; efficient operations i.e. fast turnaround times for aircraft to improve utilization; and no exceptions policies to reduce the cost of handling exceptions (e.g. no flexibility for passengers who arrive late). Cost economies can also be realized from large scale operations. However, it is important to note that as soon as more firms strive to become the cost leader, rivalry become so fierce that the consequences for the profitability in the industry are disastrous.

Differentiation Advantage

It occurs when customers perceive that a business service offering is of higher quality, involves fewer risks and/or outperform services offered by competitors. In other words, customers perceive the service offered by a business to be superior. For example, differentiation may include a firm's ability to deliver services, and other factors that provide unique customer value. BA is a multinational passenger airline. It can adopt a differentiation approach by offering passengers a higher-quality experience than many of its rivals. This allows it to charge a premium for its flights compared to many other airlines.

A differentiation advantage can be achieved by offering enhanced features such as prime landing slots can be obtained at major airports around the world; using superior and advantage technology; well-maintained, clean, and comfortable aircraft; training in customer care and the recruitment of high-quality staff; providing complementary services such as in-flight

entertainment, high-quality food, and drink. Customer value can also be increased by subjective features such as brand image, advertising based on quality of service provided. However, differentiator cannot ignore its cost position. If costs are too high the premium price are nullified.

On successfully differentiated its offering, management of BA may exploit the advantage in one of two ways viz., either increase price until it just offsets the cost of improvement in customer benefits, thus maintaining current market share; or price below the "full premium" level to build market share.

Alternatively, BA may focus on geographical region and short point to point flights to reduce costs. Michael Porter enlightens focus on attaining low cost or product differentiation for a particular buyer group, segment of product line, or geographic market rather than for the industry as a whole. The focuser can attain competitive advantage within a niche, because large firms are either not attracted to niche or have ignored the potential. The narrow focus in itself though is not adequate for a competitive advantage. The firms need to optimize the strategy on two variants; cost focus and differentiation focus. One risk of a 'focus strategy' is that broadly targeted competitors devastate the segment once it becomes economically attractive.

In addition, the currency depreciation is hitting Airlines harder and international overhead costs have risen. BA should attempt to increase the number of internal domestic flights. Moreover, ATF cost can also be lowered by investment in fuel saving modern Airbuses. However, the reduction in operating costs may outweigh the capital equipment costs.

To gain competitive advantage, BA may also assess Value Shop Model. Value Shop generates value by organizing resources (e.g. people, knowledge, and skills) and deploying them to solve specific problems. For example, delivering airline services to the passengers or delivering a solution to the business problem. Shops are organized around making executive decisions – identifying and assessing problems or opportunities, developing alternative solutions or approaches, choosing one, executing it and evaluating results.

In this way, the above discussed strategies may be more appropriate for helping BA in achieving superior performance and competitive advantage over its competitors.

Concept in Practice (As an example)

Southwest Airlines (SA) targeted on a geographic region and short point-to-point flights to reduce costs. Even though it offered no-frills service (no frills service is one for which the non-essential features like food, entertainment, printing of boarding pass etc. have been removed to keep the price low) and was based in secondary airports. SA improved quality relative to the limited set of competing alternatives by offering direct flights rather than connecting flights requiring changing planes at large hub airports. The SA also offered better on-time performance and friendly amenities.

Question 2 : [Case Study]

Topic :Supply Chain Management

An apparel manufacturing company has a factory in Ahmedabad, making denim clothing for customers of all ages. It sells its clothing from its factory outlet store located within the city. Until 6 months back, the company had a business model wherein the products manufactured as its factory would be sent to its factory outlet store. Customers would visit the store and choose apparel suiting their tastes. Production was based on prediction of customer demand. This "made to stock" model has been placed for many years.

Few months back, the store manager noticed many customers exiting without making any purchases. Tracking this and after obtaining feedback from customers over sometime, it was found that many products were unacceptable to the customers' tastes – either the shade or design of denim was not what they wanted or that the apparel was not of the correct fit for them. The management then decided to provide customers a choice of either choosing from their standard apparel range that has already been made ("made to stock" model) or to offer them a "made to order" option.

The company now displays its range of denim material at the factory outlet. Customers can go through the samples and choose the material of their choice. Company certified tailors would then take measurements based on the customers' preferences. A detailed order customized to the customers' needs would then be drawn up. The factory has set up a separate tailoring division that would stitch the apparel specifically for these "made to order" sales. For this new machines and production line resources have been put in place.

Customized products are manufactured and made available to the customer within 3 working days' time from the date of placing the order. The customer comes to the store and picks up the apparel ordered. For delays beyond this timeline, the customer gets to pay 5% less on the order value. This is done to attract and maintain customers, who would otherwise choose to purchase apparel offered by rival competitors. Therefore, speed of delivery of the customized product is critical for the company. This is the main selling point for the company to operate the "made to order" business model.

If further modifications are needed due to errors on part of the company (quality / finishing issues), the apparel would need to be modified / re-stitched once again. The company will bear the cost of modification or replacement of garment.

This new "made-to-order" has been in place for the past 6 months. At the stage of project proposal, the management found it a lucrative option for the company because:

(i) Customers are willing to pay a higher price to have customized clothing as compared to the standard fitting.

(ii) It would attract more customers to the store.

(iii) If the model works well, the dependence on the "made to stock" model can reduce. Savings in inventory cost, obsolescence and warehousing costs will benefit the company's bottom-line.

Customers have been very enthusiastic in availing this customization facility offered by the company. Sales have increased manifold in the last few months. Therefore, the management is interested to understand the metrics related to their "made to order" business mode to assess its success and risks. Some of the non-financial metrics are:

Metrics	Month					
	1	2	3	4	5	6
Orders needing modification on account of errors in order taking or manufacturing process (% of sales orders made under "made to order" model)	15%	12%	10%	8%	5%	4%
Orders delivered beyond the 3 working days timeline (% of sales orders made under "made to order" mode)	5%	4%	3%	6%	7%	5%
Production downtime (hours)	44	88	22	141	132	123
Labor idle time due to unavailability of material (hours)	25	22	17	13	24	22
Ratio of "made to order" to total sales from the factory outlet (Ratio of sales value)	16%	22%	25%	32%	34%	38%
Repeat orders by customers availing this facility (% of customers giving repeat order/ total customers availing "made to order" facility)	4%	21%	33%	54%	60%	63%

Required :

ANALYZE the non-financial measures of quality of the division over the six-month period. Focus on the production performance, delivery cycle performance and customer satisfaction.

Answer 2 :

Workings :

Metric	Month						Monthly Average
	1	2	3	4	5	6	
Production Performance :							
Orders needing modification on account of errors in order taking or manufacturing process (% of sales orders made under "made to order" model)	15%	12%	10%	8%	5%	4%	9%
Production downtime (hours)	44	88	22	141	132	123	91.67
Labor idle time due to unavailability of material (hours)	25	22	17	13	24	22	20.50
Delivery cycle time :							
Orders delivered beyond the 3 working days timeline (% of sales orders made under "made to order" model)	5%	4%	3%	6%	7%	5%	5%
Customer satisfaction :							
Repeat orders by customers availing this facility (% of customers giving repeat order/total customers availing "made to order" facility)	4%	21%	33%	54%	60%	63%	39.17%
Ratio of "made to order" to total sales from the factory outlet (Ratio of sales value)	16%	22%	25%	32%	34%	38%	28%

Analysis of the operating data of the "made to order" at the business store revealed the following:

Production Performance:

(i) Modifications to orders: Company has to bear the cost of modifications / replacement of the garment incurred on account of error in its order taking or manufacturing process. Therefore, orders needing such modification should be kept at the minimum. Such instances were higher than 10% in the first three months. With experience, either in the order taking process or manufacturing process, these errors have reduced substantially in the later months. The managers of the order taking and manufacturing department need to understand and constantly keep track of these errors in order to keep them at the bare minimum. Management may want to set a benchmark, financially in terms of the cost of modification and non-financially in terms of the acceptable threshold for such instances. Monthly tracking of this metric will help detection of errors earlier.

(ii) Production downtime: Production downtime normally occurs either due to break down of machinery or plant maintenance. It is unproductive time, reducing the machine's capacity. It must be kept minimum. Downtime hours have been steadily increasing in the last 3 months, the overall monthly average being 91.67 hours. The production manager has to analyze and take corrective action at the earliest. Urgency of the issue can be compounded by the fact that sales orders under the "make to order" model have been increasing steadily over the last few months. In the latest month, 38% of the overall sales was from this model. Therefore, the production capacity should be utilized optimally to ensure ability to meet delivery deadlines.

(iii) Labour idle time: Labour idle time due to unavailability of material is another unproductive waste of resource. The procurement department can address unavailability of material. On an average 20.5 hours of labor time is idle due to unavailability of the appropriate material. Appropriate steps with suppliers can lead to agreements to ensure seamless supply of material when required. This will enable the company to meet delivery deadlines given to customers.

Delivery Cycle Performance:

(i) On-time delivery: The orders need to be delivered to the store within 3 working days of placing order. The customer picks up the order from the store. Speed of delivery is critical to the company. For any delay beyond this timeline, the customer benefits by a 5% reduced price on the order as compensation for delay. Prompt delivery is also the company's selling point to attract customers, who would otherwise patronize its rivals. On an average 5% of the orders are not delivered within time. Therefore, average delivery success rate is only 95%. The management has to take steps that this is kept to the minimum in order to reduce loss of revenue and also to build brand loyalty with the customer base.

Customer Satisfaction:

(i) Repeat orders by customers: Prompt and quality delivery of the customized order would ensure that customers return in future with further orders. Statistics shows that repeat orders have steadily increased, which is a very positive signal to the management. Initially, only 4% of the customer under this model placed repeat orders. This increased substantially. Now almost 63% of the customers who purchase under this model come back with more orders.

(ii) Sales mix: Popularity among customers for customized services is further validated by the steady increase in the ratio of such sales to the overall sales of the company from the factory outlet. Now, this model generates an average of 28% of the total sales from the outlet, with a likely projection of having a higher share in the overall sales mix. Therefore, the "make to order" model can be termed as success.

Question 3 : [Case Study]

Topic :Value Chain Analysis

X is a leading toy manufacturing firm. Having commenced its commercial operations in the year 1990, the firm has a state-of-the-art manufacturing facility in India. It sells toys through retail outlets and the firm's website. X has been pioneering the concepts of quality and safety in toys and has been instrumental in raising the quality standards of toys in the Indian Market.

X's mission is to influence parents to spend on toys that enable every child to grow with quality toys that contributes to his / her wholesome development.

X procures the materials from a number of different suppliers. All of the purchased material are dispatched to its warehouse located at its factory and are held there unless they are moved to production. After production is completed, finished toys are moved to X's retail outlets by its own vehicles. Each week, the vehicles follow the same time schedule regardless of the weight they are carrying. Finished toys that are sold through the X's website are dispatched to its distribution centre.

X has recently got the contract to manufacture a new toy that is 'Ty-Z', a mini cartoon based on a character from a famous international animated film. X has not been given any target price, hence is free to set the selling price of 'Ty-Z'. However, it must pay a royalty of 10% of the selling price to the film director. X is also planning to sell 'Ty-Z' through its retail outlets.

X has decided to follow a target costing technique for 'Ty-Z'. Marketing manager has determined the selling price to be around ₹ 1,750 per 'Ty-Z'. X needs a margin of 26% of the selling price of 'Ty-Z'.

For the estimated costs per 'Ty-Z' refer Annexure given below.

Required :

DISCUSS three primary activities of value chain through which X can minimise cost gap if any.

Annexure

Estimated Costs per 'Ty-Z'

Particulars	**₹**
Material C	150.50
Material D	122.50
Other Material	See note below
Labour (0.4 hours at ₹ 1,050 per hour)	420.00
'Ty-Z'- specific production overhead cost	132.30
'Ty-Z' - specific selling and distribution cost	166.60
Note : Each 'Ty-Z' requires 0.70 kg. of 'other materials'. These 'other materials' are procured from a supplier at a cost of ₹ 280 per kg and around 5% of all purchased materials are found to be downgraded.	

Answer 3 :

Workings :

Statement Showing Computation of Cost GAP

Particulars	**₹**
Sales Price	1,750.00
Less: Royalty @ 10% of sales price	175.00
Less: Profit @ 26% of sales price	455.00
Target Cost 'Ty-Z'	**1,120.00**
Material C	150.50
Material D	122.50
Labour (0.40 hours at ₹1,050 per hour)	420.00
Other Material (0.70 kg x ₹280 per kg) / 0.95	206.32
Production Overheads Cost	132.30
Distribution and Sales Cost	166.60
Estimated Cost 'Ty-Z'	**1,198.22**
Cost Gap (1198.22 – 1120)	**78.22**

In this case, there is a cost gap of Rs.78.22. Where a gap exists between the current estimated cost levels and the target cost, it is essential that this gap be closed. Cost gap can be removed by reducing the cost over all the Value Chain through the development of the spirit co-operation and understanding among all members of organizations associated with the product from suppliers, producers, agents and service providers.

In X's Value Chain, three primary activities are:-

Inbound logistics:
These are activities concerned with receiving, storing and distributing the inputs (raw material) to the production process. The relationship with supplier is a key component in this process. Currently, X procures materials from multiple suppliers and stores these materials in its store. Shifting to a just-in-time (JIT) system technique in procurement of materials could possibly save substantial storage cost, provided the JIT supplier must agree to take the responsibility for the good quality and timely delivery of materials supplied. This will also become a source of savings because downgraded items will be removed. However, X might have to pay additional charges to supplier for JIT purchasing to work.

Outbound logistics:
These activities involve collecting, storing and distributing the products to the customers. At X, scheduled transportation of toys to retail outlets is outbound logistics activity. Potentially, the scheduled transportation of toys to retail outlets every week is not an efficient way. Such deliveries do not consider whether toy is required at retail outlets or not, hence X may possibly deliver toys to those retail outlets that do not need toys and suffer unnecessary transportation costs.

X should plan to implement EDI system(i.e. Electronic Data Interchange) that will help it to improve warehousing and logistics by automatically tracking inbound shipments as well as outbound products. Adopting EDI, X can not only improve processes but also streamline inventory management across many channels. However, it will require setup cost of EDI system and employee training to implement the same.

Marketing and Sales:
Marketing and sales provide the means by which the customers are made aware of the product. At X, the sales of toys via its retail outlets and website are marketing and sales activities.

X is planning to sell 'Ty-Z' via retail outlets. If X sales 'Ty-Z' through its website rather than through retail outlet, significant cost could easily be avoided. Simultaneously, X will be able to expose itself to attract international customers to buy 'Ty-Z' as product is based on character from a famous international animated film.

Overall, X may create a cost advantage by **reconfiguring** the Value Chain. Reconfiguration means structural changes such a new production process, new distribution channels or a different sales approach as discussed above.

Question 4 : [Practical Question]

Topic :Theory of Constraints

ZED produces two types of products Z and D at its manufacturing plant. Both the products are produced using the same materials, machinery, and skilled labour. Machine hours available for the year is 4,000 hours. Information relating to products is as follows:

Particulars	**Z**	**D**
Selling Price per unit	₹ 16,000	₹ 4,000
Material Costs per unit	₹ 7,000	₹ 1,200
Machine Hours per unit	1.6 hrs.	0.8 hrs.
Maximum Annual Demand	2,000 units	1,600 units
Online Booking (already accepted for)	400 units	1,200 units

Due to poor productivity levels, late order and declining profits over recent years, the CEO has suggested the introduction of throughput accounting in the company.

The total of all factory costs is ₹ 1,42,60,000 excluding material.

Required :

(i) Using throughput accounting, PREPARE statement to determine the optimum production mix and maximum profit for the next year.

(ii) CALCULATE the amount of profit lost due to acceptance of online booking of the products.

(iii) RECOMMEND the options to be followed in order to avoid any loss of profit.

(iv) LIST various ways through which price customization could be done.

(v) Given that products Z and D are respectively in 'maturity stage' and 'introduction stage' of their life cycle. STATE the most appropriate pricing policy that could be followed by the ZED for Z and D as per their life cycle.

Answer 4 :

(i) Statement Showing Machine Hours :

Product	Maximum Demand	Machine Hours / Unit	Total Machine Hours
Z	2,000 units	1.6	3,200
D	1,600 units	0.8	1,280
Total machine hours required to meet maximum demand			4,480
Less : Machine hours available			4,000
Shortage of machine hours			480

Conclusion :'Machine hours' is the bottleneck activity.

Student Note : In my personal opinion, the above working was not needed.

Statement of Ranking :

Particulars	Z	D
Selling Price per unit	₹16,000	₹4,000
Less: Material Costs per unit	₹7,000	₹1,200
Throughput contribution per unit	₹9,000	₹2,800
Machine Hour Required per unit	1.6	0.8
Throughput contribution per hour	(₹9,000/1.6) = ₹5,625	(₹2,800/0.8) = ₹3,500
Throughput Accounting (TA) Ratio (throughput contribution per hour/ factory cost per hour)	5,625/3,565 = 1.58	3,500/3,565 = 0.98
Ranking	I	II

Factory cost per hour = ₹1,42,60,000/ 4,000 hrs. = ₹3,565

Student Note : In my personal opinion, calculation of TA ratio was not needed. The ranking can be assigned on the basis of 'Contribution per hour' itself.

Optimum Production Plan :

Product	No. of units	Machine hr. per unit	Total M/C hrs.	T/P per hr.₹	Total T/P ₹
Z (online orders)	400	1.6	640	5,625	36,00,000
D (online orders)	1,200	0.8	960	3,500	33,60,000
Z	2,400/1.6 = 1,500	1.6	2,400 (Bal. fig.)	5,625	1,35,00,000
Total T/P Contribution					2,04,60,000
Less: Total Factory Cost (it is like fixed cost)					1,42,60,000
Profit					62,00,000

(ii) Had there been no online booking, we would first fulfill entire demand of Z for 2,000 units using 3,200 machine hours (2,000 x 1.6). Because of online booking already accepted for 1,200 units of product D, unfulfilled demand of product Z = 2,000 – 1,900 = 100 units.

Machine Hrs. Required for 100 units of Z (100 x 1.6)	160 hrs.
Throughput Lost for Product Z (160 hrs. x 5,625)	₹9,00,000
Throughput Return Earned from Product D (160 hrs. x 3,500)	₹5,60,000
Throughput lost	₹3,40,000

Student Note : The above calculation of loss of profit can also be calculated using differential approach as :
160 hours x (5,625 – 3,500) = ₹3,40,000

(iii) Recommendation :

Option-1

Throughput accounting ratio is the throughput return earned in an hour divided by the factory cost (labour and overheads) incurred by the factory in one hour. Factory cost is generally fixed in nature. A ratio above 1 signifies that the throughput return is greater than the factory cost and therefore the product is profitable. Product Z has a throughput accounting ratio of 1.58 while Product D has a throughput accounting ratio of 0.98.This indicates that hourly return from Product Z can cover the hourly factory cost and thus it is profitable. Product D does not yield enough hourly return to cover the hourly factory cost, hence it is not profitable. Therefore, ZED should consider ways of improving throughput accounting ratio of Product D (i.e. above 1.0). TA ratio could be improved by:

- Increasing the selling price of the Product D but the demand may fall.
- Reducing the material cost per unit as well as operating costs. However, there may be quality issues.
- Improving efficiency e.g. increase in number of units that are made in each bottleneck hour.
- Increasing the bottleneck so that more hours are available of bottleneck resource.

Option-2

ZED has to prioritize production of Product Z since it is more profitable than Product D. As per the throughput accounting ratio, Product D does not yield sufficient return per hour to cover the hourly overhead cost therefore, gets second priority over Product Z.

Since machine hours are the bottleneck, if production for entire 4,000 hours is focused on Product Z, return yielded would be sufficient to cover the factory overheads. However, Product Z has a maximum demand of only 2,000 units, which requires 3,200 machine hours (2,000 units x 1.6 hours). Remaining 800 machine hours can be devoted to Product D, during which 1,000 units can be produced (800 machine hours / 0.8 hours per unit). Maximum demand for Product D is 1,600 units. Therefore, the balance demand of 600 units of Product D will remain unsatisfied.

However, to meet unsatisfied demand of Product D, ZED may consider the option of sub-contracting either in part or whole of the production of Product D. This way it can meet the entire demand for Product D for 1,600 units. If it subcontracts the entire production of Product D, it can also scale down its in-house capacity. Sub-contracting decision requires suitable cost benefit analysis. Moreover, the risk associated with outsourcing like unsatisfactory quality and service or failure of supplier cannot be ignored.

Overall, to enhance profitability or avoid any type of loss of profit, ZED may consider the options recommended above with a long term perspective.

(iv) Pricing of a product is sometimes customized keeping taste, preference and perceived value of a customer into consideration. Price customization is done in the following ways:

- Based on product line: When products are customized as per the customer's requirements, pricing can be adapted based on the customer's specifications. Standard products can have a base price, to which the company can top-up charges to any additional customization.

- Based on customer's past behavior: Customers with good payment record have established their credit-worthiness. To sustain business, they may be extended additional discounts as compared to other customers.

- Based on demographics: Different pricing strategies may be adopted based on age or social status. For example, railway fare discounts for senior citizens or concessional price tickets for military personnel.

- Based on time differential: Different price for different time periods. If a customer extends a long-term contract, an additional discount may be extended since business is contracted for a longer period of time. Example, discounted price for data usage provided by a broadband service provider if subscription is paid for six months or more.

(v) The life-cycle of a product has 4 stages namely : Introductory stage, Growth stage, Maturity stage and Decline stage.

Product Z is given to be in the maturity stage. The third stage of product life cycle is characterized by an established market for the product. After rapid growth in sale volume in the previous stages, growth of sales for the product will saturate. Competition would be high due to large number of rivals in the market, this may lead to decreasing market share. Unit selling price may remain constant since the market is well established. Occasional offers may be used to tempt customers, otherwise this stage will mark consolidation of the market.

Product D is in the introduction stage, the first stage of product life cycle. 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:

(i) Demand for the product is elastic, i.e. more demand when prices are low.
(ii) Large scale production of the product yields economies of scale.
(iii) Threat of competition requires prices to be set low. It serves as an entry barrier to prospective competitors as well.

However, if Product D is a highly innovative product, it may adopt Skimming pricing policy. The product with unique features will differentiate it from other products leading to a revolutionary impact on market and customer behavior. Customers may not mind paying a premium for the unique product offering. Focus may be on promoting the product to gain market share. Skimming pricing policy may work when :

(i) There seem to be no competitors providing similar products.
(ii) Demand is inelastic.

Over a period of time, competitors can do reverse engineering and offer similar products. Therefore, the price may be lowered in the long run to retain market share.

Question 5 : [Case Scenario]

Topic :Ethical and Non-Financial Considerations

ABC Limited specializes in the manufacture of chemical intermediaries in a very competitive business environment. ABC is a public listed company, with majority of its shareholders being institutional investors like mutual funds, banks and insurance companies.
It is located in a water scarce zone in Tamil Nadu. There are restrictions on the tapping and usage of groundwater under the relevant laws. Penal provisions of the law will apply in case of violations. The production process requires water and the amount of water that the company can draw is limited to 19,000 kilo-litres (1 kilo-litre is 1,000 litres). Purchase of water is not an option as availability is highly erratic and exorbitant on cost.

The company manufactures two types of chemicals “A” and “B” and these are sold in kilograms. The company is in the process of making the business plan for the year 2021.
Based on the actual operating data for 2020 and taking into consideration the inflation and possible price increases that it can obtain from the market, the following product costing details have been arrived at:

Particulars	**A**	**B**
Capacity Volume kg. (not inter-changeable)	8,25,000	9,30,000
Selling Price per kg.	₹ 2,000	₹ 1,000
Variable Cost per kg.	₹ 1,500	₹ 650
Water (litre/ kg.)	12.5	10

Under the relevant income tax laws prevalent, companies with a turnover of ₹ 250 Cr. (Crores) or less are taxed at a lower rate of 25% as against the normal 30%. The company intends to keep its sales for 2021 equal to ₹ 250 Cr. or slightly lesser to avail this concessional income tax benefit.
With capacity constraints, the company has calculated that it would be still beneficial for the company to stick to ₹ 250 Cr. as only a marginal increase in turnover is possible over ₹ 250 Cr. If we cross 250 cr. Then due to higher tax @ 30%, the PAT would be still lower than the PAT arrived at after doing just ₹ 250 Cr. and availing the lower income tax rate.

CFO asked management consultant to work out the volumes in kg. of products “A” and “B” which would give an optimal (maximum) contribution given the constraints on capacity, water usage and turnover to avail the concessional income tax benefit.
Consultant works out the following product mix using Linear Programming. She also proposes another mix which does not meet the constraint on water usage where the company could end up drawing excess water than permitted by 113 kilo-litres but would result in an increase of ₹ 30 lakhs in contribution. She says that it is easily possible to do this by managing reporting to the water authorities.

Product		**Optimal**	**Suggested**
A (Volume in kg.)		8,00,000	7,85,000
B (Volume in kg.)		9,00,000	9,30,000
Contribution in ₹ Cr.		71.5	71.8
	Constraints		
Sales	<= 250 Cr.	250	250
Volume of “A” in kg.	<= 8,25,000	8,00,000	7,85,000
Volume of “B” in kg.	<= 9,30,000	9,00,000	9,30,000
Water usage (in KL)	<= 19,000	19,000	19,113

Required :
The CFO is not satisfied with the calculations. He wants you (Sr. Finance Manager) to come up with a proper DISCUSSION.

Answer 5 :

Primary goal of investor owned firms is shareholders wealth maximisation, which translate to stock price maximisation. Management Consultant's plan is looking good for the ABC as there is a positive impact on the profitability (₹30 lacs) of the company. Also, ABC operates in a competitive environment so for its survival, it has to work on plans like above.

There is another side of the coin that cannot be ignored i.e. **business ethics**. It is easily possible to manage drawing of excess water, but it is not an ethical practice as the company has responsibilities towards use of natural resources like water and protecting the environment.

Besides, a whistle-blower complaint to the water authorities can land the company into trouble in terms of penalties. If will have adverse financial impact and also such penalties are disallowed for income tax purposes. It is possible that such a violation may be reported in the media causing disrepute to the name of the company. It can also make investors in the share market stay away from the company as it has ethical governance issues. The company will face challenges in obtaining other government approvals when it will plan expansion as this violation may have to be reported on the applications seeking approvals.

Overall
May be ABC would be able to earn higher profit due to this plan in short run but it will tarnish the image of the ABC which would hurt profitability in long run. Therefore, before taking any decision on this plan, ABC should analyse both qualitative and qualitative factors.

Question 6 : [Case Study]

Topic :Direct Product Profitability (DPP)

Student Note: This question was exactly same as Q.16/131 from Volume II of Version 3 of our classroom notes of Chapter 10.

In our classroom notes, the name of the company is : XYZ Ornamental Co.

The new name in RTP was : Quebec Ornamental Company

As the entire question with all the figures was exactly same, it is dropped here to avoid duplication of work.

Question 7 : [Practical Question]

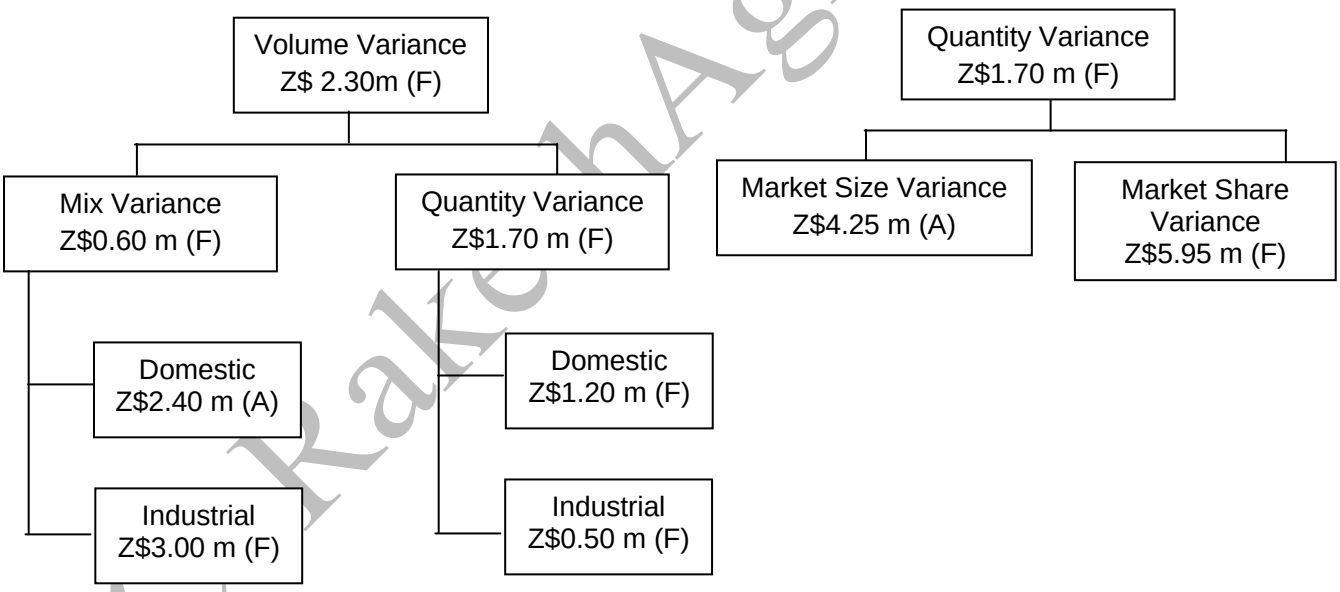
Topic :Standard Costing

ZM Inc. is a family run business based in Country Z. It is a manufacturer of two types of flooring rolls, one for industrial usage and the other for domestic residential use, throughout mainland of Country Z. The company started with the production of residential domestic flooring. It is now an established player in this market. In the recent years, the company pioneered into making flooring rolls for industrial usage. The management has the following information about the budgeted and actual data for 2020 –

Particulars	Static Budget			Actual Result		
	Industrial	Domestic	Total	Industrial	Domestic	Total
Unit Sales in Rolls ('000)	200	600	800	270	570	840
Contribution Margin (Z$ in millions)	10.00	24.00	34.00	12.825	15.390	28.215

In late 2019, a marketing research estimated market volume for industrial and domestic flooring at 8 million Rolls. Actual market volume for 2020 was 7 million Rolls. Actual sales trend of ZM Inc. is indicative of the sales trends for individual products in the future years, it is likely that they might continue to sell on a similar sales trajectory.

A newly appointed accountant has computed following variances from the above data:



'Z$' is the currency of Country Z and
'm' refers to million; assume figures in this chart are correct.

Required :
Assuming yourself as a performance management expert of ZM, the CEO has asked you to:

(i) ANALYSE the variances computed by the accountant;

(ii) ADVISE strategic inputs on 'two types of flooring rolls' to help out her in strategic decision making.

Answer 7 :

Student Note : Please note that the variances given in the question are not Sales Variances, but these are Contribution Variances. The common multiplier in calculation of these variances is 'Standard Contribution Per Unit'.

(i) Analysis of Variances :

It can be seen that total number of units sold have increased by 40,000 rolls, which resulted in a favourable volume variance. Therefore, a potential increase of Z$2.3m in contribution margin was achieved as a result of change in sales volume compared with budgeted volume.

The volume variance is further divided into a mix and quantity variance. In the case of ZM, mix variance came out to be Z$0.60m favourable and the quantity variance came out to be favourable Z$1.70m. Favourable mix variance Z$0.60m indicates that the sales mix shifts toward the industrial flooring rolls i.e. high contribution product. ZM sold 40,000 more rolls than were budgeted, resulting in Z$1.70m favourable quantity variance. Therefore, it is necessary to identify the reasons behind the increase in sales.

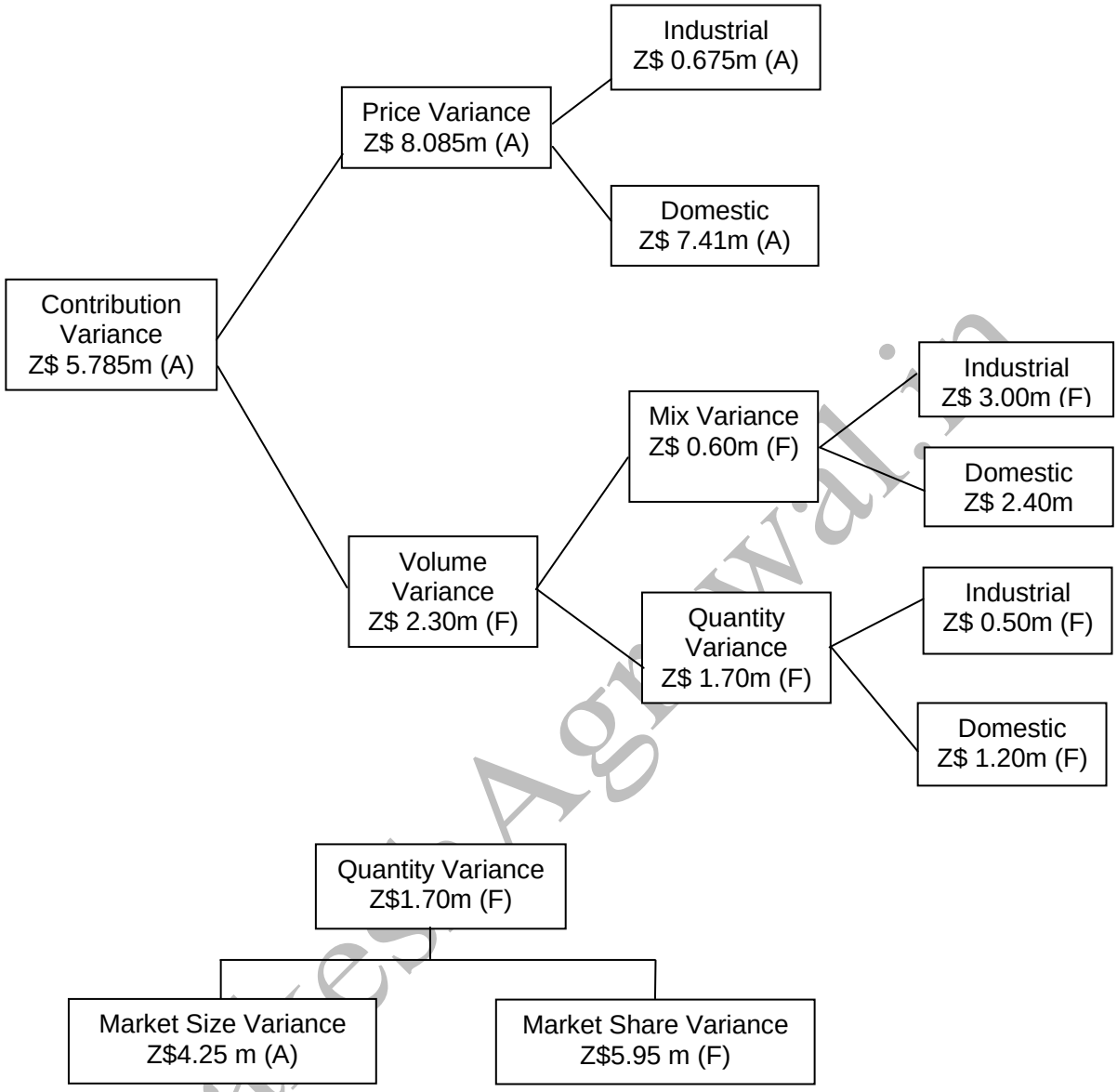
The reasons may be competitor's distribution issues, better customer services or growth in overall market. Further insight into reasons of quantity variance can be gained by analyzing market share and market size variances. ZM has gained 2% extra market share from 10% budgeted share to the actual share of 12%. The Z$ 5.95m favourable market share variance may be due to the effect of the decline in contribution margin per unit.

The impact of changing market size on contribution can be traced through market size variance. Market size variance is Z$ 4.25m adverse as actual market size decreased by 12.5% compared to budgeted market size.

Further, it appears that accountant has missed to compute the contribution price variance, which is a substantial part of the analysis. If we look closely at the data given, the contribution price variance for domestic as well as industrial roll can be computed without difficulty. The price variance for domestic flooring rolls as well as industrial flooring rolls is Z$ 8.085 m unfavourable. This indicates that the both varieties were sold at a lower contribution margin than standard. It can be seen from the working below.

Total contribution margin variance is Z$ 5.785 m adverse. The analysis shows that this negative impact on total contribution margin is mainly due to adverse contribution price variance. Revised structure after the computation of price variance is as under :

Revised Structure :



Workings :

Contribution Price Variance:

= Actual Qty. Sold x (Std. Cont. p.u. – Actual Cont. p.u.)

Product	Actual Qty. (units '000)	Standard Contribution per unit (Z$)	Actual Contribution per unit (Z$)	Variance (Z$)
Industrial	270	50.00	47.50	0.675m(A)
Domestic	570	40.00	27.00	7.41 m(A)
Total	840			8.085m(A)

(ii) Strategic Inputs :

The actual sale of industrial flooring rolls is 35% higher than projections. However, actual contribution margin of Z$47.5 is marginally lower than standard contribution margin of Z$50 per unit. This indicates that ZM may have cut its selling price to maintain or gain market share. Therefore, industrial flooring rolls is in the Growth Phase of product life cycle. Due to increase in demand, there is a possibility of higher sales and profits to be made in future years.

Similarly, the actual sale of domestic flooring roll is 5% lower than the expectations. However, actual contribution margin isZ$27 per roll i.e. 32.5% lower than the standard contribution margin. This indicates that ZM may have sold these at substantially reduced price to maintain the sales volume. Therefore, the domestic residential flooring rolls might be in the Decline Stage of product life cycle.

The market size for flooring rolls has reduced from an expectation of 80 lakh rolls to 70 lakh rolls. Therefore, the market size has shrunk significantly by 12.5% for the year 2020. This is a threat to profitability of business. The management has to understand the reasons behind this shrinkage. For example, dwindling demand may be on account of cheaper substitutes available for flooring rolls. The management has to take cognizance of this threat to business. A positive for ZM is that its actual market share for flooring rolls was higher than expected at 12%. An increase in market share would have a beneficial impact on the company's profitability. Also, despite the shrinkage in market size, demand for industrial flooring rolls seems to be on the rise. This could be an opportunity for the management to consider.

As explained above, the industrial flooring rolls seem to be in the Growth Stage of product life cycle, while the domestic residential rolls are in the Decline Stage. Industrial flooring rolls have a higher contribution margin per roll as compared to domestic residential rolls. Accordingly, ZM may consider phasing out domestic flooring rolls and concentrate on industrial flooring rolls. In view of shrinking market conditions, it would be more profitable to phase out the weaker product and concentrate on the fast moving and profitable product. At the same time, since domestic flooring roll still has significant demand, the strategy to phase out this product may have to be done in a phased and well-planned manner. In view of the shrinking market size, ZM should not end up losing its market share due to phasing out domestic flooring rolls.

For Your Conceptual Understanding only (not required to be calculated)

"Budgeted Vs Actual Figures"

Product	Budgeted Qty. Rolls ('000)	Standard Cont. Per Roll (Z$)	Budgeted Cont. (Z$ in millions)	Actual Qty. Rolls ('000)	Actual Cont. Per Roll (Z$)	Actual Cont. (Z$ in millions)	Revised Actual Qty. ('000)
Ind.	200	50	10.00	270	47.5	12.825	210 (840x25%)
Dom.	600	40	24.00	570	27	15.390	630 (840x75%)
	800		34.00	840		28.215	840

Contribution Mix Variance :

Product	Standard Contribution per unit (Z$)	Actual Qty. (AM) (units '000)	Revised Actual Quantity (SM) (units '000)	Difference ('000)	Variance (Z$)
Industrial	50	270	210	+ 60	3.00m (F)
Domestic	40	570	630	- 60	2.40m (A)
Total		840	840		0.60m (F)

Contribution Quantity Variance :

Product	Standard Contribution per unit (Z$)	Revised Actual Quantity (SM) (units '000)	Budgeted Quantity (units '000)	Difference ('000)	Variance (Z$)
Industrial	50	210	200	+ 10	0.50m (F)
Domestic	40	630	600	+ 30	1.20m (F)
Total		840	800		1.70m (F)

Market Size Variance :

= Average Budgeted Contribution per unit x [Budgeted Market Share % x (Actual Industry Sales Quantity in units – Budgeted Industry Sales Quantity in units)]
= Z$ 42.50 x [10% x (70,00,000 Rolls – 80,00,000 Rolls)]
= Z$ 4.25 m (A)

Market Share Variance :

= [(Actual Market Share % - Budgeted Market Share %) x Actual Industry Sales Quantity in units] x (Average Budgeted Contributor per unit)
= [(12% - 10%) x 70,00,000 Rolls] x Z$ 42.50
= Z$ 5.95 m (F)

Question 8 : [Case Scenario]

Topic : Non-Financial Performance Measures

Kristin LLP sells wide range of household products. The firm has recently received few negative feedbacks about the product and customer services. CEO is not happy with this. As per the opinion of CEO –

"Nowadays when social medial play such an important role in making decision, its crucial to keep an eye on the quality of customer service you provide. If you don't care about customers' satisfaction, don't expect them to care about your services or products. When customer share their story, they're not just sharing their problems. They are actually teaching you how to make your product, service, and business better."

There has been considerable discussion at the corporate level as to improve 'Customer Satisfaction'. Convinced with this logic, firm has invested heavily in customer satisfaction and adopted the following plan of action –

- Providing helpline 24/7 in order to develop personal relationship with customer;
- Redesign its online platform in order to make it more customer friendly;
- Rewarding loyal customers by giving them experience, they would not forget for life; and
- Ease the return and refund policy, offering no questions asked, as a smart move over competitors.

The CEO was initially delighted to see that their efforts pay off in the form of higher customer satisfaction score index, however he is anxious to see the corresponding financial results. It is shown in the graph below :

Required :

After the seeming lack of improvement in financial performance with customer satisfaction, should Kristen LLP stop investing in a superior customer experience? DISCUSS.

Answer 8 :

In this case we can see that there are two considerable sides of the question; one is customer satisfaction and another one is profitability. By adopting the proposed plans, firm has managed to get higher customer satisfaction score card and it is expected that with higher customer satisfaction, the firm's financial result will improve i.e. increase in ROA. However, increasing the customer satisfaction is costly. Plans which are used to increase customer satisfaction will increase the cost of the firm. This additional cost will weaken the firm's ROA by lowing profit and increasing the asset base. The optimum level of customer satisfaction is where the incremental benefits are equal to incremental costs of increasing satisfaction.

While observing the pattern of data, the customer satisfaction has increased from 86 points to 91 points in first three quarters of 2019. At this level, the additional benefits seem to more significant than the additional cost. However, in subsequent quarters, additional cost has increased more rapidly than the additional benefits. Therefore, there is decrease in ROA as we move forward on the index. However, toward the end of 2020, we see a marginal increase in ROA. This is due to the **lead-lag relation** between satisfaction and ROA. It means, the increased satisfaction might take some more time, some more quarters to result in higher ROA and the relation might not be linear. However, toward the end of 2020, the customer satisfaction score stabilizes at 96 points levels.

Overall, Kristin should not stop investing in superior customer experience, the lack of apparent pattern in customer satisfaction and profitability could stem from several causes as discussed above. Instead, firm should take decision considering current satisfaction levels, the incremental cost of increased satisfaction, and perception of the increased benefit. Moreover, the firm should also consider the current sales, otherwise it might lose its share to competitor if they do nothing.

Question 9 : [Case Scenario]

Topic : Performance Measurement in Not for Profit Sector

Olderhelp India is a leading charity working with and for the disadvantaged elderly for over 5 decades. Olderhelp advocates for their needs for universal pension, quality healthcare, action against elder abuse and many more. Olderhelp collects donations and funds and utilises them for the welfare of elders. The governing body of Olderhelp has setup four performance objectives for the three months to 30 Sep. 2020:

- To achieve a level of donation of ₹ 30,00,000
- To keep advertisement cost not more than 3% of donation.
- To keep welfare cost more than 85% of donation.
- To achieve 90% of respite care requested from the community

Actual results were as follows:

Particulars	**July**	**Aug.**	**Sep.**
Donation (₹)	7,00,000	13,00,000	11,00,000
Advertisement Costs (₹)	17,500	52,000	33,000
Elder's welfare cost (₹)	5,74,000	10,92,000	9,79,000
Respite care requests (days)	1,120	1,140	1,200
Respite care provided (days)	896	1,003	1,104

The aim is to serve elder needs in a holistic manner, enabling them to live active, dignified and healthier lives.

Required :

PREPARE a statement to assist the manager in evaluation of performance against objectives and COMMENT on the performance.

Answer 9 :

Statement Showing Performance :

Particulars	July	Aug.	Sep.
Advertisement cost as a percentage of donation - actual	2.5%	4%	3%
Target % of Advertisement cost of donation	3%	3%	3%
Welfare cost as a percentage of donation - actual	82%	84%	89%
Target % of welfare cost as a percentage of donation	85%	85%	85%
Respite care provided - actual	80%	87.98%	92%
Target percentage of respite care	90%	90%	90%

Comments :

Total donation received ₹ 31,00,000 (i.e. ₹ 7,00,000 + ₹ 13,00,000 + ₹ 11,00,000) has exceeded the target ₹ 30,00,000. Though there is no fix trend of receiving fund while it is noticeable that there were special fund raising activities in August which generated highest receipt.

Advertisement costs have been within the target of 3% in July and Sept but exceeded the target in August. More information is needed to establish why this occurred.

For the month of July and Aug, the welfare cost are less than the target, while for the month of September, welfare cost as % of donation has been exceeded the target.

There is a steady improvement in the respite care provided by Olderhelp and for the month of September, it has surpassed the target.

Question 10 : [Case Scenario]

Topic : Competitive Advantage

The following are the income statements of two firms in the same industry:

Particulars	Firm WD (₹)	Firm WG (₹)
Revenues	20,00,000	40,00,000
Less: Variable costs	9,00,000	24,00,000
Contribution margin	11,00,000	16,00,000
Less: Fixed costs	7,00,000	12,00,000
Profit before taxes	4,00,000	4,00,000

Required :

IDENTIFY the strategy (cost leadership v/s differentiation) followed by two firms. JUSTIFY your classification.

Answer 10 :

Key Calculations :

Particulars	Firm WD	Firm WG
Contribution margin / Sales	0.55	0.40
Fixed costs / Sales	0.35	0.30
Profit margin / Sales	0.20	0.10
Variable Cost to Sales Ratio	45%	60%
Total Fixed Cost (₹)	7,00,000	12,00,000

ICAI Answer :

Higher contribution margin ratio exhibited by firm WD indicates that firm WD is following a **differentiate strategy** while firm WG appears to be more focused on **cost leadership**. This is also substantiated by higher fixed costs i.e. R&D, innovation for each sale ₹ in firm WD.

Innovation allows a firm to command premium prices and earn more contribution per sales ₹. However, innovation is expensive.

Note : My views are completely contradictory with ICAI views and hence it is given below.

My View & Answer :

- Variable cost to sales ratio is lower for WD. It indicates that this firm is able to produce at a lower cost and thus has a cost advantage.
- Fixed cost remains constant irrespective of sales and hence it is to be seen on total basis, instead of viewing it as a % to sales. Firm WD has a substantially lower fixed cost than WG. It again is an indication of cost advantage.
- However, Firm WG is able to generate much higher sales revenue (i.e. double) as compared to WD. It indicates that WG is able to attract more customers than WD. It is an indication of product differentiation strategy. Product of WG seems to be superior to WD.
- Firm WG has spend more on fixed cost. It might be due to higher R&D and innovation expenditure incurred to create a product differentiation advantage over the competitor. In order to create a superior product, one has to spend more amount of money on research.
- Hence, my conclusion is that : Firm WD is following Cost Leadership strategy and Firm WG is following Product Differentiation strategy.

* * * * *

Extra Questions taken from Jan. 2019 Module

Question 1 : [Practical Question]

Topic : Just in Time [ICAI Module Ref. : 3.47]

A manufacturer is considering implementing Just in time inventory system for some of its raw material purchases. As per the current inventory policy, raw materials required for 1 month's production and finished goods equivalent to the level of 1 week's production are kept in stock. This is done to ensure that the company can cater to sudden spurt in consumers' demand. However, the carrying cost of inventory has been increasing recently. Hence, the consideration to move to a more robust just in time purchasing system that can reduce the inventory carrying cost. Details relevant to raw material inventory are given below:

- Average inventory of raw material held by the company throughout the year is ₹ 1 crore. Procurement of raw material for the year is ₹ 12 crore. By moving to just in time procurement system, the company aims at eliminating holding this stock completely in its warehouse. Instead, suppliers of these materials are ready to provide the goods as per its production requirements on an immediate basis. Suppliers will now be responsible for quality check of raw material such that the raw material can be used in the assembly line as soon as it is delivered at the company's factory shop floor.
- Increased quality check service done by the suppliers as well as to compensate them for the risk of holding the inventory to provide just in time service, the company is willing to pay a higher price to procure raw material. Therefore, procurement cost will increase by 30%, total procurement cost will be ₹ 15.6 crore per year. Consequently, quality check and material handling cost for the company would reduce by ₹ 1 crore per year. Similarly, insurance cost on raw material inventory of ₹ 20 lakh per year need not be incurred any longer.
- Raw material is stored in a warehouse that costs the company rent of ₹ 3 crore per annum. On changing to Just in time procurement, this warehouse space would no longer be required.
- Production is 150,000 units per year. The company plans to maintain its finished goods inventory equivalent to 1 week's production. Despite this, in order to have a complete cost benefit analysis, the management is also factoring the possibility of production stoppages due to unavailability of raw material from the suppliers. This could happen due to of delay in delivery or non-conformance of goods to the standard required. Labor works in one 8 hour shift per day and will remain idle if there is no material to work on. Due to stoppage of production for the above reason, it is possible to have stockout of 3,000 units in a year. Stockout represents lost sales opportunity due to unavailability of finished goods, the customer walks away without purchasing any product from the company. Therefore, in order to reduce this opportunity cost and to make up for the lost production hours, labor can work overtime that would cost the company ₹ 10 lakh per annum. This is the maximum capacity in terms of hours that the labor can work. With this overtime, stockout can reduce to 2,000 units.
- Currently, sale price is ₹ 5,000 per unit, variable production cost is ₹ 2,000 per unit while variable selling, general and administration (SG&A) cost is ₹ 750 per unit. Raw material procurement cost is currently ₹ 800 per unit, that will increase by 30% to ₹ 1,040 per unit under Just in time inventory system.
- On an average, the long-term return on investment for the company is 15% per annum.

Required

(i) CALCULATE the benefit or loss if the company decides to move from current system to Just in Time procurement system.

(ii) RECOMMEND factors that the management needs to consider before implementing the just in time procurement system.

Answer 1 : [It is slightly modified by me]

(i) Calculation of Incremental Profit / Loss due to switching over to JIT System :

Particulars	Current Purchasing Policy (₹)	JIT Procurement System (₹)
Raw material procurement cost per year	12,00,00,000	15,60,00,000
Quality check and material handling cost (No longer required in JIT)	1,00,00,000	---
Insurance Cost on raw material inventory (No longer required in JIT)	20,00,000	---
Warehouse rental for storing raw material (No longer required in JIT)	3,00,00,000	---
Overtime Charges under JIT to reduce Stockouts (WN 1 below)	---	10,00,000
Stockout Cost (WN 2 below)	---	40,20,000
Total Relevant Cost	16,20,00,000	16,10,20,000

Therefore, moving to just in time procurement system results in savings of ₹ 980,000 per year for the company. If reinvested, long term return on investment for the company at 15% would yield a return of ₹ 147,000 per year. Therefore, total benefit for the company would be ₹ 11,27,000 per year.

Working Notes :

Note 1: Should overtime cost be incurred to reduce Stockouts?

Contribution per unit = Sale price - Variable production cost - Variable SG&A OH

Revised Variable production cost under the just in time system

= ₹ 2,000 + ₹ (1,040 - 800) = ₹ 2,240 per unit

Contribution per unit = ₹ 5,000 - ₹ 2,240 - ₹ 750 per unit = ₹ 2,010 per unit.

Overtime cost can reduce stockouts from 3,000 units to 2,000 units that is customers' demand of 1,000 units more can be met.

Contribution earned from selling these 1,000 units = 1,000 × ₹ 2,010 per unit = ₹ 20,10,000.

Therefore, the contribution earned of ₹ 20,10,000 is more than the related overtime cost of ₹ 10,00,000. Therefore, it is profitable to incur the overtime cost.

Note 2: Stockout Cost :

Out of the total shortfall of 3,000 units, by spending on overtime 1,000 units of demand can be met. Therefore, actual stockout units is only 2,000 units. As explained above, contribution per unit is ₹ 2,010 per unit. Hence, stockout cost = 2,000 units × ₹ 2,010 per unit = ₹ 40,20,000.

Student Note : ICAI has assumed that there is no stock out at present. It will occur only under JIT system.

(ii) The company plans to eliminate its raw material inventory altogether. Raw material will be delivered as per production schedule directly at the factory shop floor, from where production will begin. The management should therefore carefully consider the following points:

(a) The entire production process has to be detailed and integrated sequentially. This is essential to know because it should be known in advance when in the sub-assembly process each raw material is required and in what quantity.

(b) Since production is dependent on delivery and quality of raw material, heavy reliance is being placed on suppliers. They should be able to guarantee timely delivery of raw material of the appropriate quality. The company is paying a premium of 30% of original cost, that is ₹ 240 per unit extra in order to ensure the same. Each unit gives a contribution of ₹ 2,010 per unit, which is 40.2% of the sale price per unit. Lost sales opportunities due to unavailability of raw material or non-conformance of the material can result in substantial losses to the company. While, portion of this has been factored while doing the cost benefit analysis of implementing Just-in-time systems, it needs careful consideration and monitoring even after implementation. Therefore, to hedge its loss, the management and suppliers should agree on penalties for the suppliers for any delay or nonconformance in quality of materials beyond certain thresholds.

(c) Accurate prediction of sales trends is important to determine the production schedule and finished goods planning.

(d) Continuous monitoring of the system even after implementation is essential to ensure smooth operations. Management commitment and leadership support is essential for its successful implementation and working.

Question 2 : [Case Scenario]

Topic : Business Process Re-engineering (BPR) [ICAI Module Ref. : 3.50]

ANA is one of Country 'I''s top footwear companies and other equipment. Since its foundation in 1988, ANA has been one of the all-inclusive footwear brand that is committed to nurturing the youth across the world through sports to contribute to society. Over more than three decades, the company inherits its values and provides own products while capturing the changes in the social environment. It's state-of-the-art production facilities are located strategically across the Country 'I' and produces all kinds of footwear. ANA is best known for its high ethical standards towards its workers, suppliers and the environment and voluntarily publish CSR report every year.

Organizational Structure and Footwear Market

ANA is organized into conventional functional departments such as procurement on order basis, sales, and finance, most of which have their non-reliable excel sheet-based systems for planning and reporting. Consequently, it often fails to generate accurate, timely and consistent information to monitor its own performance, thus, company faces failures in achieving the performance and delivery targets set by its retail customers.

In Country 'I', footwear market is competitive and seasonal. Retailers, who are ANA's customers, for footwear, they have two main demands, they want –

(i) footwear at lower prices to pass it on to consumers.

(ii) suppliers to meet performance and delivery targets relating to lead times and quality.

In order to comply with the retailer's demands, ANA's competitors have discontinued all their own manufacturing facilities and outsourced all production to suppliers, who have much larger production lines and lower costs. To reduce the shipment cost over long distances, competitors have invested in advanced procurement software to consolidate orders so that each 40-foot shipping container gets fully loaded. Purchase invoice processing is also automated via the integration of information systems into the supplier's software.

Proposal of Outsourcing

In order to mitigate costs, it has been proposed to outsource the manufacture of footwear, to a Chinese Supplier 3,750 km away. A comparison of the average cost of manufacturing and the cost of outsourcing footwear is given below-

Particulars	Manufacturing	Outsourcing
Average manufacturing cost per pair	BND 625	
Purchase cost per pair		CNY 28

Notes -
Country 'I''s home currency is the BND.
Exchange Rate 1 CNY = 18 BND.

In addition to the purchase cost from the supplier, ANA will be subject to pay for shipping costs at the rate of BND 40,000 for each large, standard sized shipping container, regardless of the number of units in it. Each container contains 5,000 pairs when fully loaded.

Custom tariffs are expected to change soon, footwear imports into ANI's home country might be subject to 10% basic custom duty (plus 10% social welfare surcharge on duty) on the assessable value of imports excluding shipping costs.

Therefore, to implement the proposal, restructuring of functional departments into multi-disciplinary teams are needed to serve major buyer accounts. Each team is required to perform all activities, related to the buyer account management from order taking (sales order) to procurement to arranging shipping and after sales services. Team members dealing with buyers will work in ANA's corporate office, while those like QC etc. managing quality and supplier audits, will work at the manufacturing site of Chinese Supplier. Teams will be given greater independence to selling prices to reflect market conditions or setting a price based on the value of the product in the perception of the customer. Many support staff will work as helper roles, or be offered new job opportunities overseas after the restructuring.

Expert Advise :

Prof. WD, Performance Management Consultant has advised ANA that the proposal has features of re-engineered processes and can be defined as business process re-engineering (BPR). Prof. advised, for evaluating the proposal, ANA should consider software development for full front-end order entry, purchasing, and inventory management solution which may be required along with ethical aspect of the proposed changes.

Required :

(i) ADVISE on information system which would be required for the reengineering.
(ii) ASSESS the likely impact of reengineering on the ANA's high ethical standards and accordingly on business performance.
(iii) EVALUATE how the BPR proposal can improve ANA's performance in relation to retail customers.

Answer 2 :

(i) Advise on Information System :

Combining several jobs into one, permitting workers to make more decision themselves, defining different versions of processes for simple cases v/s complex ones, minimizing situations when one person check someone else's work, and reorganizing jobs to give individuals more understanding and more responsibility are characteristics of re-engineered processes.

In ANA, outlays can be saved by rearranging staff into multidisciplinary teams, for example, reducing number of excess staff at different stages – cutting, preparation, finish etc. These savings can be utilized in additional costs such as investment in new information systems. Hammer and Champy stress the use of information technology as a catalyst for major changes. BPR organizes work around customer processes rather than functional hierarchies.

Presently, ANA's departments have their own excel sheet-based systems for planning and reporting which is unreliable and inconsistent. They are inadequate to provide the accurate, timely and consistent data which ANA needs to meet its own performance and delivery targets. There must a shared database that should be accessible by all parts of the functional teams. This should have real time updation, so that employees in different time zones can use updated data. The database should include financial data and non-financial data, like cost information, data related to lead times and quality. Information systems must be featured with all required reports like performance report, budget report etc.

In addition, ANA is required to invest in special system as advised by Prof. WD for full front-end order entry, purchasing, and inventory management solution to minimize shipping costs by ensuring that the shipping containers get fully loaded and to integrate with supplier's information systems to automate purchase invoicing.

Overall, ANA must analyze that whether the benefits due to information technology are worthy.

(ii) Assessment of Likely Impact of Re-engineering on Ethical Standards :

Workers :

ANA is famous for its high ethical standards towards workers and staff. Because of adopting BPR proposal, manufacturing staff are likely to be unemployed. Competitors, have already shutdown their factories, these workers may not be able to find similar jobs.

Employees who continue in work may become disappointed if they think the application of BPR is detrimental to their interest. This may reduce productivity, increase staff turnover or difficulties in recruiting new staff. In addition, they may also be demotivated if they are appointed on unfamiliar roles, or may not be willing to learn new skills.

Some of staff members may be motivated by the opportunity to perform new types of work, learn new skills or work outside India. This may enhance their individual performance.

Suppliers :

Any association with non-ethical practices, for example, if the Chinese supplier is indulged in using non-acceptable working practices, could seriously spoil ANA's reputation for high ethical standards. This could undermine financial performance because customers may not buy its products, or possible investors might refuse from providing capital. Staff members located at the manufacturing sites are responsible for supplier audits, which may assist to mitigate this risk.

Environment :

ANA should consider the environmental impact of importing goods from long distances. The environmental related credentials of the Chinese Supplier are not known. Since, ANA voluntarily publishes a corporate sustainability report, any distortion in its performance on environmental issues might undermine the financial performance.

(iii) Evaluation of BPR Proposal in relation to Retailer's Demand :

Lower Prices

In order to sell footwear at lower prices, there is a proposal to reduce costs by outsourcing production to supplier. The current average production cost of manufacturing is BND 625 per unit. The cost of purchase from an external supplier works out to be BND 512 as landed cost. That is purchase cost + shipping cost.

BND 504 (CNY18 x BND28) purchase cost, *plus* BND 8 (BND 40,000 / 5,000) shipping cost. This 18.08% (113/625) saving is a substantial improvement in financial performance, but not a dramatic one. It may be noted that BPR is a methodology that should be applied only when radical or dramatic change is required. Further, exchange rate movements may also slash the cost saving significantly. In the near future, expected changes to international trade tariffs will increase the unit cost to CNY 31.08 (CNY 28.00 x 111%) i.e. 559.44 in BND and reduce the cost saving to just 10.49% (65.56 / 625).

Meeting Performance Targets

Lead times

Current lead times for customer orders are not ascertainable. Since the proposed Chinese Supplier is 3,750 km away, consignment will take several weeks to be imported by sea. This may increase lead times substantially, although may be set off by faster production times in supplier's plant. As ANA's sales are seasonal, retailers may order in advance, decreasing the long lead times. In order to decrease shipping costs, shipping containers must be full, meaning that deliveries must be in larger quantities.

Quality

ANA is already known for manufacturing high quality footwears. The quality of the new supplier's footwear needs to be checked. Any distortion in the quality of footwear will deteriorate its reputation and decrease long-term business performance since only few customers would order. Quality standards checking is more difficult while using outside suppliers, especially at long distance, than manufacturing in ANA's own factory. In BPR, work is done where it makes most sense to do so. In this aspect, having employees responsible for quality checking and supplier audits (working at the manufacturing site abroad) will assist ANA in sustaining the best supplier relationship management.

Question 3 : [Case Scenario]

Topic : Target Costing [ICAI Module Ref. : 4.21]

Kaveri Ltd. (KL) is a manufacturer of bikes in India and it sells them in India and outside India. KL has just launched the World's smallest and most affordable bike called 'Zingaroo'. The bike is mounted with all-aluminum, single cylinder, air cooled, 99.2 cc engine. The engine makes just over 8 bhp power and 8 Nm in torque, but it stakes claim to be the fuel-efficient bike, with a claimed figure of 88 kmpl. It has been creating competition for two wheelers as none of the Indian companies as well as foreign companies, offer a bike for such a competitive price within the reach of middle class family.

KL has adopted target costing technique in manufacturing this bike. For KL, maintaining target price was difficult. During the designing and production process of bike, inputs costs increased frequently. However, KL designed various components especially for bike to maintain the target price. Though, one curiosity prevails, how this can be done in the future when input costs are bound to increase further.

Many environmentalists have opposed the manufacture of this bike, because they believe that mass production of small bike (about 2.5 lakh bikes every year) will create heavy pollution. Many people believe that this small bike is not up to the safety standards due to lightweight and use of aluminum and plastic frames. The design of this bike is entirely different from that of other bikes. This also causes a doubt that the existing bike mechanics would be able to repair or not.

Durability of bike is another issue in the Indian environment. Further, performance of 'Zingaroo' more or less depends upon the condition of roads and traffic system.

After the launch of 'Zingaroo', many other national and international automobile companies are also planning to manufacture small bike which will create tough competition in near future.

Required :

Now you being a strategic performance analyst of KL, answer the following questions :

(i) IDENTIFY strategy which KL has adopted for 'Zingaroo' bike?

(ii) After adopting target costing, IDENTIFY issues and challenges faced by KL and suggest the remedial action to be taken to solve these issues?

Answer 3 :

i) KL has adopted Low Cost Strategy for `Zingaroo' bike since the main purpose of manufacturing this bike was to make it cheapest and affordable.

ii) The issues and challenges faced by KL and their remedial action are as follows :

Maintaining of Target Price :

'Zingaroo' bike is one of the world's cheapest and smallest bike. Maintaining target-price proved to be a big challenge for the KL since input cost of bike are bound to increase further in future. The initial value engineering may not uncover all possible cost savings. Thus, Kaizen Costing may be designed to repeat many of the value engineering steps for as long as a bike is produced, constantly refining the process and thereby stripping out extra costs.

Environmental Issues :

Many Environmentalists have opposed the manufacture of bike as they believe that mass production of small bikes will create heavy pollution since automobile pollution is already a big problem for a country like India. For this issue, 'Zingaroo' bike can be prepared based on BS emission norms. These norms restrict the pollution created by any motor vehicle.

Safety Issues :

Since 'Zingaroo' bike is made of aluminium and plastic frames so this may also create safety issues for the customers. For such issues, KL should meet safety standards. Further, KL should make people aware that 'Safety is Primary' or ' Drive Safely'.

Servicing / Repairing Facilities :

The design of 'Zingaroo' bike is entirely different from that of other bikes. This causes a doubt that the existing bike mechanics would be able to repair or not. For such problem, creation of a good network of service center can be a solution i.e. repair centre should be established at required places.

Durability :

Durability of 'Zingaroo' bike is another issue in the Indian environment. The performance of bike more or less depends upon the condition of roads and traffic system. For such issues, tyre quality and hydraulic brake system should be compatible to the roads and traffic system.

Global Competition :

After the launch of 'Zingaroo' many other national and international automobile companies are also planning to manufacture a small bike, which will be a big challenge for the KL in the near future. To face such competition, it may adopt Kaizen Costing technique. The cost reductions resulting from Kaizen Costing are much smaller than those achieved with Value Engineering but are still worth the effort since competitive pressures are likely to force down the price of 'Zingaroo' over time, and any possible cost savings allow KL to still attain its targeted profit margins while continuing to reduce cost.

Question 4 : [Case Scenario]

Topic : Product Life Cycle & Pricing [ICAI Module Ref. : 7.21]

Netcom Ltd. manufactures and sells a number of products. All of its products have a life cycle of less than one year. Netcom Ltd. uses a four stage life cycle model (Introduction, Growth, Maturity and Decline).

Netcom Ltd. has recently developed an innovative product. It was decided that it would be appropriate to adopt a market skimming pricing policy for the launch of the product.

However, Netcom Ltd. expects that other companies will try to join the market very soon.

This product is currently in the introduction stage of its life cycle and is generating significant unit profits. However, there are concerns that these current unit profits will not continue during the other stages of the product's life cycle.

Required :

Explain, with reasons, the changes, if any, to the unit selling price and the unit production cost that could occur when the products move from the previous stage into each of the following stages of its life cycle :

(i) Growth

(ii) Maturity

Answer 4 :

(i) Growth Stage :

Compared to the introduction stage the likely changes are as follows :

Unit Selling Prices :

These are likely to be reducing for a number of reasons :

- The product will become less unique as competitors use reverse engineering to introduce their versions of the product.
- Netcom may wish to discourage competitors from entering the market by lowering the price and thereby lowering the unit profitability.
- The price needs to be lowered so that the product becomes attractive to different market segments thus increasing demand to achieve the growth in sales volume.

Unit Production Costs :

These are likely to reduce for a number of reasons :

- Direct materials are being bought in larger quantities and therefore Netcom may be able to negotiate better prices from its suppliers thus causing unit material costs to reduce.
- Direct labour costs may be reducing if the product is labour intensive due to the effects of the learning and experience curves.
- Other variable overheads costs may be reducing as larger batch sizes reduce the costs of each unit.
- Fixed production costs are being shared by a greater number of units.

(ii) Maturity Stage :

Compared to the growth stage the likely changes are as follows :

Unit Selling Prices :

These are unlikely to be reducing any longer as the product has become established in the market place. This is a time for consolidation and whilst there may be occasional offers to tempt customers to buy the product the selling price is likely to be fairly constant during the period.

Unit production Costs :

Direct material costs are likely to be fairly constant in this phase and may even rise as the quantities required diminish compared to those required in the growth stage with the consequential loss of negotiating power.

Direct labour costs are unlikely to be reducing any longer as the effects of the learning and experience curves have ended. Indeed the workers may have started working on the next product so that their attention towards this product has diminished with the result that these costs may increases.

Overhead costs are likely to be similar to those of the end of the growth phase as optimum batch sizes have been established and are more likely to be used in this maturity stage of the product life cycle where demand is more easily predicted.

Question 5 : [Example]

Topic : Transfer Pricing [ICAI Module Ref. : 9.20]

A Company has two divisions A and B, making products A and B respectively. One unit of A is an input for each unit of B. B has a production capacity of 45,000 units and ready market. Other information available regarding Division A are :

Capacity (production units)	50,000
Maximum External Sales units	30,000
Fixed costs up to 30,000 units is Beyond 30,000 units; it increases by ₹ 50,000 for every additional 10,000 units	₹ 4,30,000
Variable Manufacturing Cost p.u.	₹ 55
Variable Selling Cost p.u. (for external sales)	₹ 10
Variable Selling Cost p.u. (for special order / transfer to B)	₹ 5
Selling Price p.u. (for external market)	₹ 80
Selling Price (for special sales)	₹ 70

B can buy the input A from outside at a slightly incomplete stage at ₹ 45 p.u. and will incur subcontracting charges of ₹ 30 p.u. to match it to the stage at which it receives goods from Division A. Division B is willing to pay a maximum ₹ 75 p.u. if Division A supplies its entire demand of 45,000 units. If Division A supplies lesser quantity, Division B is willing to pay only ₹ 70 p.u.

Division A has also received a special order for 15,000 units which it needs to either accept in full or reject. Division A may choose to avoid variable selling cost of ₹ 5 p.u. on transfer to B or on special order, by incurring a fixed overheads of ₹ 50,000 p.a. instead.

(i) What is the best strategy for Division A? Show the profitability of that option.

(ii) What will be the range of transfer price, if the best strategy is chosen?

Answer 5 :

(i) What is the best strategy for division A?

With a production capacity of 50,000 units, Division A has to find an optimum mix of sales between external sales, internal transfer to Division B and special order. Division B requires 45,000 units. Division A can supply the entire 45,000 units to Division B for which transfer price is ₹ 75 p.u. or can supply lower quantity for which transfer price is ₹ 70 p.u.

As production increases, certain cost components would also change. Changes to cost of production and selling expenses are discussed below.

(a) Selling expenses : It is given that for special orders or internal transfers, Division A can either bear a variable selling cost of ₹ 5 p.u. or choose to incur a fixed cost of ₹ 50,000 p.a.

Working out the indifference point, the selling cost will be the same at 10,000 units (i.e. = ₹ 50,000 / ₹ 5 = 10,000 units). For any internal transfer or special sale below 10,000 units, it makes sense to bear the variable cost of ₹ 5 p.u. Over 10,000 units it makes sense to bear the fixed cost of ₹ 50,000 p.a.

Even if Division A chooses to cater entirely to external sales of 30,000 units, the balance 20,000 units will be used to cater to either the special order or as internal transfer to Division B or can even be both (i.e. special order 15,000 units and internal transfer 5,000 units). Since in any case, total sale will be more than 10,000 units, Division A can opt to bear the fixed cost of ₹ 50,000 p.a.

(b) Fixed Manufacturing Cost :

ICAI View : Division A is working at full capacity i.e. 50,000 units are produced. Fixed cost shall be ₹ 4,30,000 (for first 30,000 units) and it would increase by ₹ 50,000 for every extra 10,000 units produced over 30,000 units. Hence total fixed cost will be 4,30,000+ 50,000 + 50,000 = ₹ 5,30,000.

My View : In the above view, ICAI has assumed that Division A will produce and sell all the 50,000 units and hence will incur a fixed cost of ₹ 5,30,000.

I feel that one should work out whether producing beyond 30,000 units is profitable for Division A or not, and then take a decision. If incremental contribution beyond 30,000 units is more than incremental fixed cost, then only Division A should produce beyond 30,000 units. It can happen if the incremental contribution is more than ₹ 5 per unit to recover the incremental fixed cost of ₹ 50,000 for every extra 10,000 units produced over 30,000 units.

Note : As the calculations done below justify the production beyond 30,000 units and hence production of all 50,000 units is profitable for Division A. Hence, the final answer with ICAI view and my view will ultimately remain the same.

To arrive at the optimum mix, Division A will calculate the contribution received per unit under the various options as follows :

Particulars	External Sale up to 30,000 units	Special Order 15,000 units	Transfer to B, less than 45,000 units	Transfer to B, all 45,000 units
(a) Selling Price	80	70	70	75
(b) Variable Costs :				
Manufacturing	55	55	55	55
Selling & Dist.	10	0	0	0
(c) Contribution (a) – (b)	15	15	15	20

Decision :

The above calculation indicates that, transfer to division B of 45,000 units yields the highest contribution of ₹ 20 per unit. This leaves a balance capacity of 5,000 units with Division A, whose maximum capacity is given as 50,000 units. This is insufficient to meet the special order of 15,000 units. (Please note that the special order has to be accepted in full or to be rejected).

Hence, Division A will utilize the balance 5,000 units to cater to external sales. Therefore, the optimum production mix would be :

Transfer to Division B 45,000 units and external sales 5,000 units.

Profitability Statement of Division A :

Particulars	Figures in ₹
Contribution from -	
Transfer to Division B (45,000 units x ₹ 20)	9,00,000
External Sales (5,000 units x ₹ 15)	75,000
Total Contribution from Sales	9,75,000
Less : Manufacturing Fixed Cost (as discussed in point 'b' above)	5,30,000
Less : Selling Fixed cost (as discussed in point 'a' above)	50,000
∴ Profit Earned	3,95,000

(ii) Range of transfer price under the best strategy :

As explained above, the best strategy for Division A would be to sell 45,000 units to Division B and 5,000 units externally.

Minimum Transfer price per unit

= Marginal Cost per unit + Additional fixed cost per unit + Opportunity cost per unit

As Discussed above, additional outlay would be the fixed selling cost of ₹ 50,000 that it chooses to incur rather than incur a variable cost of ₹ 5 p.u. If this fixed selling cost is spread over 45,000 units, then the per unit cost would be ₹ 1.11 (₹ 50,000 / 45,000 units)

Had division A not sold 45,000 units to Division B, it would have chosen from any of the other three options viz. (a) selling 30,000 units externally or (b) meeting special order of 15,000 units or (c) transfer of less than 45,000 units to Division B. In all these cases, it would have yielded a contribution of ₹ 15 p.u. This is the opportunity cost for Division A for choosing the best strategy.

Therefore, Minimum Transfer Price that Division A will demand shall be -

= Marginal Cost per unit + Additional fixed cost per unit + Opportunity cost per unit

= ₹ 55 + ₹ 1.11 + ₹ 15 = ₹ 71.11

Maximum Transfer price that Division B is willing to pay is given as = ₹ 75

Hence, the range of transfer price would be between ₹ 71.11 to ₹ 75.

Question 6 : [Basic Concepts]

Topic : Transfer Pricing [ICAI Module Ref. : 9.33]

G is the transferring division and R, the receiving division in a company. R has a demand for 20% of G's production capacity which has to be first met as per the company's policy. State with reasons, which division, G or R enjoys more advantage in each of the following independent situations, assuming no inventory built up.

Sr. No.	G Transfers to R at Transfer Price equal to	G's Production level	External Demand	Division having more advantage	Reason
(i)	Full cost : No mark up	60%	40%		
(ii)	Market Price	80%	60%		
(iii)	Marginal Cost	100%	80%		
(iv)	Market Price	100%	90%		

Answer 6 :

Sr. No.	Division having more Advantage	Reason
(i)	G	G is utilizing only 40% of production capacity by selling to 'External Market' which implies that G might have not been able to recover its full fixed costs. By transferring 20% of its production capacity to Division R at full cost, G will be able to recover fixed costs component. Transfer price above marginal cost will lead to an incremental contribution for Division G.
(ii)	G	G will not be losing any external market demand as it is within its production capacity. By transferring 20% of production capacity to division R at market price, G will earn extra contribution towards the fixed costs and profit.
(iii)	R	Here G is operating at 100% Capacity level and external market demand is 80% only i.e. G is not losing any external market demand. But by transferring 20% of production capacity to R at marginal cost i.e. at variable cost, G may not be able to recover fixed cost part of total cost. On the other hand R will be able to get these units at marginal cost only.
(iv)	G	To satisfy 20% demand of R, division G will lose an opportunity to sell in the external market for 10% of its capacity. However, it would be earning the same revenue by transferring the goods to division R at market price. Hence, in fact, there is no opportunity cost to G. Moreover, G will be able to utilize additional 10% of its production capacity to earn an incremental profit on it.

* * * * *

Extra Questions taken from Nov. 2020 Module

Chapter 3 : Lean System & Innovation

Topic : Total Productive Maintenance - Calculation of OEE

There is a slight change in the formula of Availability Ratio for the calculation of OEE.

Formulae for calculation :

(a) Availability Ratio : Changed formula

= Actual operating time available x 100
*Planned production time

Important Note : The above formula is as per the revised module of ICAI released in Nov. 2020. There is a slight modification in the denominator of the above formula. In the earlier module, the denominator was **Gross** available time and in the revised module, it is **Planned** production time.

Planned down time such as preventive maintenance, lunch break, tea break etc. is not regarded as loss of time as per the revised approach. It means, planned down time should be excluded while calculating 'Planned production time'.

(b) Performance Ratio (i.e. Efficiency Ratio) : No change in this formula

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

(c) Quality Ratio : No change in this formula

= Number of units accepted (i.e. good units) x 100
Total number of units produced

(d) OEE% = Availability Ratio % × Performance Ratio % × Quality Ratio %

This can be better understood with the following example -

Question 1 : [ICAI New Module Ref. : 3.22 to 3.24]

Kiwi Ltd. manufactures automobile spare parts. A 12 hour shift is scheduled to produce a spare part in KIWI Ltd. as shown in the schedule below. The shift has three 15 minute breaks and a 10 minute clean up period.

Production Schedule for Automated Machine NZ 10 :

Cycle : 10 (seconds) i.e. standard time for one unit

Spare parts manufactured : 3,360 units

Scrap : 75 units

Unplanned downtime : 36 minutes

Required : Calculate 'OEE'.

Answer 1 :

1. Calculation of Available time, Production time and Actual operating time per shift :

Particulars	Minutes
Total available time per shift (12 hours x 60 min.)	720
Less : Planned Downtime : Three planned breaks (3 x 15 min.) Clean up period	 45 10
∴ Planned production time per shift	665
Less : Unplanned Downtime (given)	36
∴ Actual operating time per shift	629

2. Availability Ratio :

= Actual operating time available x 100
Planned production time

= (629 min.) x 100 = 94.59%
(665 min.)

Note : If we would have gone by old method, then the availability ratio would be -

= (629 min. / 720 min. x 100) = 87.36%

It means, under the new method, availability ratio has improved, because we have ignored planned and unavoidable downtime in the calculation of denominator.

3. Performance Ratio (i.e. Efficiency Ratio) :

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

= (3,360 units x 10 seconds) / 60 x 100
629 minutes (as above)

= (560 min. / 629 min. x 100) = 89.03%

4. Quality Ratio :

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

= (3,360 - 75 units) x 100 = 97.77%
3,360 units

6. OEE Ratio :

OEE % = Availability × Performance × Quality

= 94.59% x 89.03% x 97.77%

= 0.9459 x 0.8903 x 0.9777

= 0.8234 = 82.34%

Question 2 : [Chapter 2]

Topic : Cost of Quality [ICAI New Module Ref. : 2.7]

Livewell Ltd. is a manufacturing company that produces a wide range of consumer products for home consumption. Among the popular products are its energy efficient and environment friendly LED lamps. The company has a quality control department that monitors the quality of production.

As per the recent cost of poor quality report, the current rejection rate for LED lamps is 5% of units input. 5,000 units of input go through the process each day. Each unit that is rejected results in a ₹ 200 loss to the company. The quality control department has proposed few changes to the inspection process that would enable early detection of defects. This would reduce the overall rejection rate from 5% to 3% of units input. The improved inspection process would cost the company ₹ 15,000 each day.

Required :

(i) Analyse the proposal and suggest if it would be beneficial for the company to implement it.

(ii) After implementation, Analyse the maximum rejection rate beyond which the proposal ceases to be beneficial?

Solution 2 :

(i) Analysis of the new proposal :

Particulars	**₹ / day**
Savings in the loss due to reduction in rejection rate [₹ 200 per unit x (5% - 3%) x 5,000 units]	20,000
Less : Cost of inspection process improvement	15,000
∴ Net benefit to the company	5,000

Conclusion : Considering net benefit of ₹ 5,000 per day to the company, it is advisable to implement the proposal.

(ii) Calculation of maximum rejection rate :

Particulars	**₹**
(a) Cost of implementing proposal	15,000
(b) Savings in loss per unit	200
(c) Reduction in rejection of minimum no. of units to recover the above cost [a / b]	75 units
(d) Reduction in rejection in % of input [75 / 5,000 x 100]	1.5%
(e) Maximum allowable rejection in % of input [5% - 1.5%]	3.5%

Question 3 : [Chapter 5]

Topic : Power Sector [ICAI New Module Ref. : 5.11]

A Study on Proposed Investment in Nuclear Power Project :

Glare Inc. is a national power generating company in uranium rich Country "G". Its core business is generation and sale of electricity to state-owned power distribution companies and state boards. All power plant of Glare work in same way by taking in fuel and producing electricity, harmful gases and waste products. The output i.e. electricity produced out of the power plants is measured in megawatt hour (MWh). Glare has long-term goal to reduce its carbon-emission rate to less than 500 kilogram per megawatt-hour (kg/MWh) by 2025. Company is following the footstep of many leading countries, those have developed big power sources to feed and satisfy the ever increasing demands for power in many industries and factories. Currently, most of economically successful and industrialized countries are fulfilling their industrial needs through nuclear power. However, limited supplies of fuel for nuclear power plants may thwart the growing interest in nuclear energy.

In Country "G", demand for electricity is expected to grow by an estimated rate of 12 percent per year due to rising populations, growing wealth and escalating demand of goods and services that require more electricity. Moreover, Country "G" is planning to develop network of high speed train which require huge amount of electricity. To boost power sector, the government recommended the change in the licensing process so that a new power plant receives both the construction permit and the operating license prior to the start of construction and created the Committee for 'Electricity Industry Restructuring' to deregulate the market. In addition, government is conscious towards the way Country "G" can reduce its carbon emissions. Therefore, government has decided to reduce the same by 30% from the present level in coming 5 years.

Glare has a proposal to take benefit of growing demand by increasing its power generation capacity through installing a nuclear power plant in City "Y". A nuclear plant takes about five years to build with government permission. It cost about G$1,000 billion to construct. It has work life of 40 years. Current cost for decommissioning a nuclear power plant is G$200 billion. This includes estimated costs to safely dispose of any onsite nuclear waste, any radioactive material, including nuclear fuel as well as irradiated equipment and buildings.

Operating and fuel costs for new nuclear plants are proving to be quite competitive to other fuel sources. The average costs of operations, maintenance and fuel in Country "G" is 80 cent per kilowatt hour (KWh). Data published by the Nuclear Energy Research Institute (NERI) shows that, new nuclear energy plants in the Country 'G' may need to produce electricity at a total cost of below G$ 2.40 per KWh to remain competitive with the fossil fuel options.

Note : Country "G"s local currency is G$. The current exchange rate is 1GD = USD 0.0125

Annexure - Glare Inc.

Power Plant Annual Statistics, 2020

Particulars	Plant 1	Plant 2	Plant 3	Plant 4	Plant 5	Proposed
Primary Fuel	Coal	Diesel	Oil	Natural Gas	Pet. Coke	Nuclear
Capacity (MW)	1,400	12	875	1,850	200	2,800
Capacity Factor	0.795	0.750	0.798	0.80	0.735	0.82
Electricity Generation (MWh)	96,16,320	77,760	60,32,880	1,27,87,200	12,70,080	1,98,37,440
CO2 Emissions (MT)	91,11,573	90,686	50,61,615	74,13,132	8,15,711	4,95,936

CO2 Emissions (kg/MWh)	948	1,166	839	580	642	25

Notes :

1. Carbon Dioxide (CO2) emissions are estimated based on the industry standard.
2. Annual Capacity Factors are averages of the monthly values for 2020. Monthly Capacity Factors are computed as 'the actual monthly generation' divided by 'the maximum possible generation' for that month. 'The maximum possible generation' is the number of hrs. in the month multiplied by the monthly capability.

Evaluation of Proposal

Demand for electricity

In Country "G", estimates indicate that demand for electricity is expected to grow at 12% per annum. The rising population, growing wealth and escalating demand of goods and services that require even more electricity as well as proposed network of high speed train are a factor behind this. Therefore, demand for electricity in coming five years will be 70% to 80% more than the present levels.

Glare will be able to take benefit of this growing demand by installing a nuclear power plant. Setting up a plant of 2,800 MW capacity in City "X" will increase its annual production to 4,96,21,680 MWh by 2025 The effect would be dynamic i.e. 66.6% increase over existing production level.

CO2 emission rate

Glare's strategic planning is to focus on long term goal to reduce its carbon-emission rate. Therefore, It has created a long term performance standard i.e. to reduce *overall* carbon-emission rate less than 500 kilogram per megawatt-hour (kg/MWh) by 2025. Setting up a new nuclear power plant will enable it to reduce overall CO2 emission rate from 755 kg/MWh to 463 kg/MWh i.e. below target level specified. In addition, this will also support government's objective of reducing the carbon emission in coming five years. The effect will be -39% over 5 years.

Particulars	Current	2025	Change
Total CO2 Emission Rate (kg/MWh)	2,24,92,717/2,97,84,240 = 755	2,29,88,653/4,96,21,680 = 463	- 39%

Estimation of the cost of electricity generated from nuclear power plant

Computations show that, new nuclear energy plant in City "X' will produce electricity at a total cost of below G$ 2.40/KWh, *making it competitive with the fossil fuel options*. This is estimated total cost against the electricity output over the life time of new power plant. This total cost includes the investment cost charges, the present worth of annual fuel and operating expenses. The *investment cost* charges are the present worth of cost for design, construction, refurbishing, decommissioning and expenses scheduled during construction period. The *fuel and operating costs* include the purchasing, convert and enriching uranium, fuel fabrication, spent fuel conditioning, reprocessing, transportation, and disposal of spent fuel; plant operations and maintenance labour cost.

The cost of nuclear power generation works out to G$ **2.31/KWh**. The main cost component is the construction cost, G$ 1.26/KWh. Other components of cost are small in comparison i.e. G$ 0.80/KWh. Decommissioning and waste management costs are G$ 0.25/ KWh. These costs contribute only a few percent to the investment cost of the plant and have an even lower impact on the electricity generation cost as these costs are discounted over the life of the plant; impact of the same is about 10.8% of the cost of electricity produced. These may likely be of a large order of magnitude far into the future due to *uncertainty involved*.

Note : Cost includes construction, operation and maintenance, fuel and decommissioning.

[{ 1,200 b / (1,98,37,440 x 40) } / 1,000 + 0.80] = **G$ 2.31/KWh**

Economic viability

It is important to note that investment cost (i.e. cost of construction etc.) is the most important aspect in determining the *economic competitiveness* of nuclear power project; however, this does not assess a project's *economic viability*. The appropriate measure is the cost of the electricity produced by the nuclear project in comparison to the other sources of electricity and in comparison to market price of electricity at the time the nuclear power plant becomes operational. Country "G" is going to deregulate the market, in this type of market, *there is a risk that subsequent events e.g. new technology etc.* could unpredictably make the plant become uncompetitive before the investment cost is repaid as there will no longer be a direct relationship between the cost to produce electricity and their price that can be charged for it. *Price will be set by competitive market place*, without the opportunity to increase prices to cover unexpected outlay. Therefore, investing substantial amount in a project with a risk may be a *serious concern for the stakeholders*.

One of the primary contributors to the investment cost of nuclear plant is cost of money used to finance nuclear plant construction. The financing cost rises when the time needed to license and construct a plant increases. Country "G" is modifying its licensing process so that a plant receives both the construction permit and the operating license before production starts. Therefore, there will not be any requirement for large capital investment in plant before completion of a specific portion of the licensing process. It is given that estimated time from the start of construction to the start of operation is 5 years. Relaxation in licensing norms will have a *positive impact* on this time period as well as on the investment cost.

Availability of fuel

Nuclear power is a feasible option today for generating *additional capacity* with many power generating companies looking at the opportunity of either starting or expanding their fleet. But, limited supplies of uranium, this is being primary fuel that can be used for power generation in nuclear reactors, may thwart the growing interest in nuclear energy. Since the Country "G" is uranium rich country, therefore supply of fuel would not be a big concern. However, *price pressure resulting from ultimate resource constraints* at global level could *affect the uranium prices*.

Long term source of energy

Nuclear power plants are likely to operate for at least 40 years, some probably longer. In contrast, gas and coal fired power plants are expected to have a lifetime of around 30 years, though in a few cases this may be extended with a major refurbishment. It is important to note that as the life increases, the *uncertainty about the future costs and benefits* increases.

Environmental effect

Nuclear power has been considered as a source of providing net environmental benefits since nuclear power makes negligible contribution to global warming through the emission of carbon dioxide. However, *risk of radiation leakage* resulting from accidents at a power plant or during the

transport of spent fuel cannot be ignored. Operators of nuclear power plants are generally answerable for any damage to third parties caused by an incident at their installation regardless of fault.

Overall

Nuclear power has always been recognized by a combination of higher construction and lower operating costs as compared to fossil fuel alternatives. If environmental costs are taken into consideration, the total costs incurred by nuclear power generation may prove to be even more *cost-competitive* because it is a cleaner technology.

Cost competiveness, goal alignment, positive change in the licensing process and a dynamic market growth have made nuclear power an attractive energy choice for Glare. However, the *issues that are unique to nuclear* e.g. regulator's actions, spent fuel disposition, public perception of safety, decommissioning standards etc. should be factored into the decision making process.

Question 4 : [Chapter 8]

Topic : Non Financial Performance Measurement [ICAI New Module Ref. : 8.19]

Lite automobile limited (LAL) is one of leading automobile assembly part manufactures of the country. In order to manage the performance of LAL, the CMD in latest board meeting shown his willingness to apply non-financial performance indicators (NFPI) in addition to financial performance indicators.

CEO conducts meeting thereafter with functional heads. Some of the functional heads are concerned with the scope of the NFPI as part of performance management system. During the meeting Chief HR Lead of company raise his concern over the utility of NFPI to monitor and control the human resource. Chief Operating Officer also raise his concern on the manner how NFPI can ensure quality in the products and services. Chief Public Relation Officer also concerned how NFPI will improve the brand equity.

Required :

Office of CEO hired you as management consultant, for designing and effective implementation of performance management system which also consider NFPI. CEO asked you to briefly EXPLAIN the scope of non-financial performance indicators in regard to only 3 functions whose functional heads raised the concern.

Solution 4 :

The performances management system, which also consider non-financial performance indicators in addition to financial performance indicators; capable to ensure sustainable performance in all functional areas; hence its scope is organisation wide. In regard to three functional areas specifically mentioned in the case scope shall be –

Human resources

It is the people who actually create the organisation through processes, hence human resources are a significant element of any organisation. If they performance well, the entire organisation automatically performs well; hence measures such as staff turnover, absenteeism, job satisfaction, and offer letter accepted shall be part of.

Quality of product and service

What make any business distinct from others, it is largely the value which it's products or services capable to create for the consumers; quality is important determinant of value. Hence, the following performance measures (owning to quality) can be part of performance metrics -

- How much value the product is creating currently?
- Where do product offer in comparison that of competitor?
- Is product capable to generate further superior performance and scope of innovation?

Brand equity

Non-financial performance measures consider the brand equity (value of the brand) as one of the significant performance measures. Brand value is largely based upon factors like customer's awareness & loyalty which includes consumer behaviour also perceived quality, stakeholders' expectation and organisation ability to meet them, and factors like patents and trademarks etc.

Question 5 : [Chapter 12]

Topic : Reconciliation of Profit [ICAI Module Ref. : 12.20]

Well known Footwear (WF) is a shop that focuses on shoes for various sports and activities like jogging, cricket, tennis, and hockey. Budgeted profit for the WF is calculated considering an average selling price of ₹ 500 per pair of shoes and an average cost of ₹ 350 per pair of shoes. The supervisor of the WF has discretion in staffing and in setting prices. Usually, the WF is staffed for total 650 hrs. per month at a budgeted rate of ₹ 125 per hr. In addition to this base wages, sales staff gets a commission equal to 5.5% of sales revenue. Moreover, staffing levels (i.e. working hours) are not expected to change in response to "little" changes in shoe sales. For September 2020, the WF had budgeted sales of 2,250 pairs of shoes and 650 staffing hrs.

Actual results for September, 2020 were as follows :

Pairs of shoes sold	2,500
Revenue	₹ 12,00,000
Less : Cost of shoes sold	₹ 8,25,000
Less : Staff - Basic wages @ ₹ 125 per hour	₹ 78,125
Less : Staff - Commission payment	₹ 66,000
∴ Profit	₹ 2,30,875

Note - "little" changes in shoe sales is specified as ± 12%.

Required :

(i) PREPARE a reconciliation statement of budgeted profit to actual profit.

(ii) COMMENT on supervisor's performance.

Solution 5 :

Working Notes :

1. Key Data, Assumptions & Information :

- Though it is not mentioned in the question about which approach to follow i.e. Absorption costing or Marginal costing, ICAI has used Marginal costing approach to solve this question.
- Cost of shoes and commission payable to staff is treated as variable cost.
- Base wages of staff is treated as fixed cost, because this cost will remain constant up to ± 12% change in sales revenue.
- Budgeted sales quantity was 2,250 pairs and actual sales quantity is 2,500 pairs i.e. 250 extra pairs are sold. This is 11.11% rise in sales volume (250 / 2,250 x 100). This change is within 12% and hence, there is no change in fixed labour cost.
- We need to find out some quantitative data, so that calculation of variances becomes easy. This data is shown below. Use balancing figure technique to calculate it.

2. Budgeted & Actual Data :

Particulars	Budgeted Data			Actual Data		
	Qty.	Rate	Amount ₹	Qty.	Rate	Amount ₹
(a) Sales Revenue	2,250	500	11,25,000	2,500	480	12,00,000
(b) Cost of shoes	2,250	350	7,87,500	2,500	330	8,25,000
(c) Commission	2,250	27.50	61,875	2,500	26.40	66,000
(d) Contribution [a - b - c]	2,250	122.50	2,75,625	2,500	123.60	3,09,000
(e) Basic wages	650 hrs.	125/hr.	81,250	625 hrs.	125/hr.	78,125
(f) Profit [d - e]			1,94,375			2,30,875

3. Calculation of Variances :

(a) Total Profit Variance = Budgeted Profit - Actual Profit
= ₹ 1,94,375 – ₹ 2,30,875 = ₹ 36,500 (F)

(b) Sales Price Variance = Actual Qty. sold x (Std. S.P. – Actual S.P.)
= 2,500 x (500 – 480) = ₹ 50,000 (A)

(c) Contribution Volume Variance = Std. Contribution per unit x (Bud. Qty. – Actual Qty.)
= 122.50 x (2,250 – 2,500) = ₹ 30,625 (F)

(d) Shoe Cost Variance (variable) = Standard cost of actual output - Actual cost
= (₹ 350 x 2,500 units) – 8,25,000 = ₹ 50,000 (F)

(e) Commission Cost Variance (variable) = Standard cost of actual output - Actual cost
= (₹ 27.50 x 2,500 units) – ₹ 66,000 = ₹ 2,750 (F)

(f) Labour Cost Variance (fixed) = Budgeted cost – Actual cost
= ₹ 81,250 – ₹ 78,125 = ₹ 3,125 (F)

Main Answer :

(i) Reconciliation Statement of Profit :

Particulars	**₹**
Budgeted profit - WN 1	1,94,375
Sales Price Variance (A) - WN 3(b)	(50,000)
Contribution Volume Variance (F) - WN 3(c)	30,625
Shoe Cost Variance (F) - WN 3(d)	50,000
Commission Cost Variance (F) - WN 3(e)	2,750
Labour Cost Variance (F) - WN 3(f)	3,125
∴ Actual Profit	2,30,875

Student Note : My way of calculation and presentation of answer is different from ICAI. However, the final answer is same. I have given above a detailed working with formulae. Comparing my answer with ICAI may lead to confusion, hence you may avoid it.

(ii) Comment :

The performance seems to be good. It shows that the supervisor of the WF has passed on the benefit of decrease in shoe cost to customers. It is evident from Shoe cost variance and Sales price variance, i.e. shoe cost decreased by ₹20 per pair, from a standard cost of ₹350 per pair to an actual cost ₹330 per pair. On the other hand, the selling price decreased by ₹20 per pair, from a standard price of ₹500 per pair to an actual price of ₹480 per pair. In turn, the reduction in the selling price appeared to produce a favourable sales volume variance and a reasonable increase in profit also.

Due to reduction in the selling price, staff commissions per unit is lower than budgeted, because the commission is based on sales price. It has led to favourable commission cost variance of ₹2,750.

Lastly, staffing was 25 hours less than budget, leading to a savings of 25 hours x ₹125 per hour = ₹3,125 favourable labour cost variance. It means, the supervisor has attained an increase in sales with lesser staff hours.

Overall, it appears that the manager has done a great job of making revenue and controlling costs, which has lead to increase in profits.

* * * * *