

PAPER – 5: STRATEGIC COST MANAGEMENT AND PERFORMANCE EVALUATION

Question No.1 is compulsory.

Candidates are also required to answer any

four questions from the remaining **five** questions.

Working notes should form part of the respective answer.

Question 1

PAL Finance Ltd. is one of the largest players in the consumer finance segment and is the most diversified and profitable non-banking finance company (NBFC) having 100 branches across the country. PAL's wide portfolio of products is spread across Consumer, Small and Medium Enterprises (SME), Commercial Lending and has substantial presence in rural lending as well. PAL is a pioneer in introducing interest-free EMI finance options in more than 50 categories, ranging from consumer durables to lifestyle products to groceries. The ever enthusiastic, always excited and confident management wants to make a foray into Wealth Management business vertical, which will focus on providing simple and effective long term financial planning concepts and tools for assisting customers in making informed decisions for their saving and investment needs.

When the company thought about its strategy to achieve the Big Goal, the main focus was on an important element: 'what strength of our past do we want to carry into the future ? Of all the options, one thought resonated across, reflecting in all outcomes over the course of its existence - Sustainability. This is the outcome of over half a century of work of the parent company-White Group; which is delivered through each business that the Group has ventured into. Anything that the company does has to pass through this critical filter.

To press with the idea further, the CEO of PAL Finance Ltd. has narrated four of its achievements over the period to the Group Chairman Mr. Sarva, by a soft communication which reads that:

- *Focus on Existing Customers Needs*

We believe that more products per customer cannot be achieved by more customers but by more satisfied customers. More satisfied our customers, more likely they'll partner with us for their next big pursuit. More likely, they'll recommend their family and friends to us. The more our customers recommend us, the less we need to worry on getting new customers. The less we worry on getting new customers the more we'll focus on existing customers.

- *Innovation*

We were the first to introduce a 3-minute on the spot approval for our Consumer Durable Finance offer, we are now down to 1 minute. By the time you have finished reading this, we would have added another partner to our Lifestyle Finance portfolio. And some of our customers would have already downloaded all their loan account statements through the online portal. The result of our obsession with sustainability - even, it is about your efforts.

- *Technology*

For the last five years, the company has continued to increase investment in technology. We adopt newer and emerging technologies keeping in mind the needs and preferences of our customers. This gives an unmatched flexibility of engaging with the company for every financing related requirement by the customers. Our technology enables our customers to transact without the restrictions of time, place and proximity. Our customers are in a position to get affirmative answers to questions like, Can I apply online ? Will I get a regular statement of account ? With every single detail of your loan. Giving me access anytime, anywhere ? Can I foreclose my loan ? Can I borrow back some of the loan I've repaid without a human interface?

The company deploys technology not to take the human touch away but to give a richer customer experience, allowing a customer to exercise choices even when it comes to being serviced. Because technology alone is not the output, it is the creativity with which it is used that delivers the objective.

- *Build Partnerships to achieve best practices*

We believe when our customers buy a product or service from us, they are placing their trust in us. Trust itself is a delicate matter. It needs both expertise and experience, together. When we partner with NEEL for our online capabilities, with TAPAS for our software and with CITTA for process mapping and PRAJNA for auditing us, we believe we're implementing zero tolerance to compromise. And even for our partnerships, we have created benchmarks in innovation in how we have deployed their systems and processes to create bold new realities.

As a result of all these practices, during the current financial year - our performance shows:

- *Number of new loans booked increased by 17% to ₹ 20 crores.*
- *Customer franchise grew by 24% to ₹ 30 crores.*
- *AUM grew by 27% to ₹ 1,000 crores.*
- *Total income increased by 43% to ₹ 250 crores.*
- *Net interest income rose by 42% to ₹ 160 crores.*
- *Total operating cost grew by 35% to ₹ 50 crores.*
- *Total operating cost to net interest income improved to 33% from 35% in FY 2019.*
- *PAT grew by 32% to ₹ 55 crores.*

Shareholders were satisfied with the good performance of the company and in turn good returns provided on their investments. The company had achieved brand loyalty with a satisfied customer base.

The group Chairman Mr. Sarva, an highly regarded intellectual, could infer that the communication narrating all the positives of PAL Finance by the CEO, is relatable to their recent conversation, wherein, the CEO was questioning the relevance of Business Excellence model

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suggested for PAL. Mr. Srava who is known for his critical observations by his very nature, posted to the CEO on the prevailing insights in the White Group.

The group's philosophy of business revolves around four under mentioned principles:

- (i) *Sustainability: Present success does not guarantee future - Sustainable success is crucial and a complicated factor.*
- (ii) *The essence of any business model is to be proactive rather than being reactive.*
- (iii) *An excellence in business cannot be attained if the staffs are forced to conform to certain norms.*
- (iv) *Whatever be the business model that suits the organization it is not to be taken as one time exercise.*

Mr. Sarva is intended to appraise the CEO that Business Excellence Model is an overreaching framework for managing and aligning the multiple organizational initiatives and to have a sustained success for an indefinite future.

Required

- (a) *Based on the facts given above you are requested to ANALYSE what Mr. Sarva has intended to convey to the CEO of PAL and why in just two lines. (1 Mark)*
- (b) *EXPLAIN briefly what is meant by Business Excellence. (1 Mark)*
- (c) *If you happen to be the Group Chairman, EVALUATE each of the group's philosophy of business revolving around the above mentioned four principles, to the CEO of PAL Finance Ltd to make him understand the relevance of Business Excellence Model to an organization. (4 Marks)*
- (d) *LIST the tools available for PAL Finance Ltd. to achieve and sustain excellence. (2 Marks)*
- (e) *PAL Finance Ltd is a well-established player in the industry and is planning to expand its business. In order to achieve business excellence, APPLY the fundamentals of EFQM model in the context of PAL. (9 Marks)*
- (f) *The criteria of the model comprise of 'enablers' and 'results'. EXPLAIN very briefly what is meant by 'enablers' and 'results'. (3 Marks)*

Answer

- (a) Mr. Sarva intended to convey the relevance of the business excellence model for PAL Financial Limited because CEO was questioning the **relevance of such a business excellence model** in the recent past. Mr. Sarva knows that, by communicating the achievements attained by PAL Financial Limited during the financial year, the **CEO tries to justify his concern over relevance**, hence he (Mr. Sarva) mentioned that Business Excellence Model is an overreaching framework for managing and aligning the multiple organizational initiatives and to have a sustained Success for an indefinite future.

- (b) **Business Excellence *is a philosophy for developing and strengthening the management systems and processes of an organization to improve performance and create value for stakeholders.***

The essence of this approach is ***to develop quality management principles*** that increase the overall efficiency of the operation, minimize waste in the production of goods and services, and help to increase employee loyalty as a means of maintaining high standards throughout the business ***by achieving excellence in everything that an organization does*** (including leadership, strategy, customer focus, information management, people, and processes).

- (c) **Principle 1** – Mere being profitable is not sufficient; organisations (be it in any industry or form) ***need to be sustainable in order to survive and grow***. No doubt during the financial year PAL Financial Limited perform successfully in terms of adding customers franchise (24%), selling more services (17% more loans and 27% increase in AUM), and income (both interest income (42%) and PAT (32%)), but it needs to be sustainable. ***Sustainability is beyond continuing better financial performances*** because society expects companies to operate ethically and for the overall betterment of the society and environment.

Since ***creating a sustainable future is one among (and substantial too) the fundamentals of the business excellence model*** through focusing on all the classes of stakeholder and harnessing innovation & creativity, hence business excellence model become relevant to each of organisation, including PAL Financial Services.

Here it is important to note that business excellence is a philosophy for developing and strengthening the management systems and processes of an organization to improve performance and create value for stakeholders.

Principle 2 – Being agile is essential for survival but being ***proactive (rather than being only reactive) is important*** for attaining a competitive advantage. The early mover advantage is always there. Hence, managing the complexities of the trade environment with agility and proactively become a success factor. For example, PAL Financial services as a financial services company can think about adopting techniques like blockchain algorithm ahead of others and become ***a leader rather than a laggard or mere follower***.

Every excellence model forces organisation to strive for agility, keep on doing innovation making better the best, and better than best, hence relevant to organisation.

Principle 3 - Each operation within a company enables a corresponding result. Since the business excellence models are holistic tools, hence ***present a cause-effect relationship between operations (enablers) and their resultant consequences***. If the company wants to achieve a different result, it has to do things differently. But the question arises, who performs the operation to excel the enablers? The answer is Human especially the Staff/Employee.

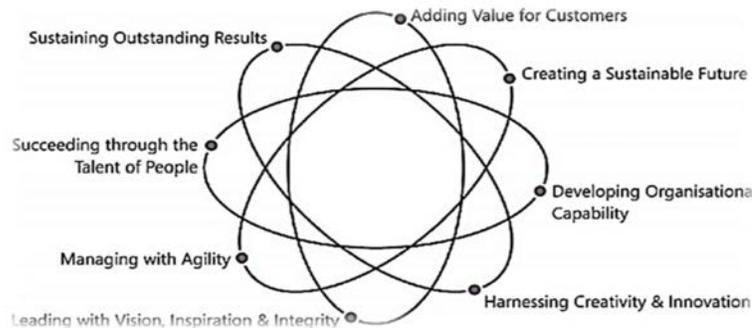
Since every business excellence model established cause and effect relation, hence staff feel empowered by knowing what value he is adding in the attainment of organisations overall objective. Further, an ***excellence model enables the organisation to succeed through the skills of humans, because by inculcating learning and skill in staff, organisation can add value to their clients. Mere force to conform to certain norms will not help much.***

Principle 4 - It is imperative not just to achieve excellence but also to sustain it. ***Continuous improvement on various operations will ultimately lead to excellence.*** More importantly, excellence models need to be used to sustain and maintain excellence to retain their competitive advantage. They are not to be taken as a one-time exercise by the company. ***Assessments using this model have to be made periodically so that timely action can be taken to achieve the desired result.***

- (d) Business excellence models consider various management thoughts as core concepts and structures quality management in a manner that can be adapted by any enterprise. Hence in order to achieve and sustain excellence, PAL Finance Limited may adopt and practice best suited (to their organisation) Business Excellence Model as a tool.

Several business excellence models exist across the globe. While variations exist among them, but these models are all remarkably similar. **Some of the popular business excellence models are mentioned below–**

- (i) European Foundation Quality Management (EFQM) model
 - (ii) Baldrige Criteria for Performance Excellence
 - (iii) Singapore BE Framework
 - (iv) Japan Quality Award Model, and
 - (v) Australian Business Excellence Framework.
- (e) As mentioned, that PAL Finance Limited (Here-in-after refer as to PFL) is a well-established player in the industry and is planning to expand the business, hence, to attain business excellence it can adopt the EFQM model; because the eight fundamentals (concepts of excellence, under EFQM model), are the basic principles that describe the essential foundation for any organisation to achieve sustainable excellence. Therefore, creating an EFQM management document gives the PFL a holistic overview of its strategic goals, the key approaches it has adopted, and the key results it has achieved.



These 8 fundamental concepts of excellence can be applied to PFL as–

1. **Adding value to customers/clients – PFL needs to understand their customers, their needs, anticipate their needs, and make use of opportunities to full-fill their expectations.** PFL is working in the regulated sector but still, there are diverse financial products and services which customers of PFL require or desire because it has a wide portfolio of products that spread across a wide range and classes of customers; hence **before going to “how it can meet customer’s needs, the PFL should be clear on “what” need of the customer it can satisfy considering the resources and capabilities.** Once the ‘what’ is clear, the PFL should have mechanisms in place to **find out and anticipate customer preferences.** Accordingly, it should **structure its operations to add value to the clients** in terms of quality, availability, support, experience, and flexibility. **Communication of CEO shown commitment to this fundamental.**
2. **Creating a sustainable future –** Society and the environment play a major role in ensuring the sustainability of the business. **PFL should have a positive impact on its surroundings (both People and the Planet).** Despite PFL in an industry that has a less environmental impact but still, needs to assess the environmental impact of its operations and took measures to minimize adverse impacts (if any, such as reducing the energy consumption and reduction in the use of papers by shifting to e-reports) at the same time it also needs to conduct **social impact analysis,** in term employment it generates, work-culture it provides, CSR activates that it undertakes, and the nature, profile and socio-economic importance of business/clients to whom it helps through offering financial product or services.
3. **Developing Organizational Capability –** Companies need to manage change within the organization and beyond. PFL should identify what it is capable of being great at? Only then it able to differentiate from its competitors. In the financial sector, the major features of excellence include secure, reliable, and confidential services; hence PFL should strive to attain the same. Further PFL should **identify and develop unique capabilities to have a competitive edge in the market.** **Communication of CEO shown commitment to this fundamental too as he mentioned that PFL is building partnerships to achieve best practices.**

4. **Harnessing creativity and innovation – *Continuous improvement and innovation bring value to the company.*** PFL should promote a working environment that enables and appreciates creativity and innovation. Since the sector is regulated and the fund is involved hence SOPs should adhere, but **innovation in terms of technological breakthroughs is a great move, such as e-services and 24x7 access.** PFL has ***already undertaken a few steps in this direction.*** Communication of CEO shown commitment to this fundamental. **Creativity can be in the form of creating and offering new or customised products that capable to cater the need of businesses in a dynamic business environment.**
5. **Leading with vision, inspiration, and integrity –** Leaders shapes the future of the organisation, because it is the leaders who define the very purpose of the existence of the organisation through a vision statement. They also decide the progress and its' phase through the inspiration that they themselves carry and pass on to subordinates as well as they impact the integrity which each stakeholder of organisation possess. ***The leaders and management at PFL should have a clear vision of what to achieve, develop a strategy to achieve it, work with integrity and ethics.***
6. **Managing with agility –** Being agile makes any organisation flexible, hence bring the capabilities to identify and respond proactively to opportunities and threats. PFL **should respond proactively to the changing dimension of business** to make necessary changes in their product and process through those products rendered to remain ahead of the market.
7. **Succeeding through the talent of people –** It is human who builds the organisation and prospers it; hence an organization is only as good as the people who work in it. A constructive work culture, where learning and job satisfaction are put on priority can help organisations to attain excellence through generating competitive advantage. Hence ***PFL should develop a culture where the goals of individuals shall be in alignment with organisation's objective and vision.*** Further PFL shall **develop a system of performance management** that comprises a matrix for performance evaluation, reward and recognition programs, training programs, and talent networking to cultivate talent within the PFL.
8. **Sustaining outstanding results – *Fostering a culture wherein adopted best practices becomes the standard operating procedure,*** can stand out an organisation ahead of others. Hence striving for excellence is not one in a while effort it requires perseverance and continuity. **Constant and periodic evaluation** is required to keep up and sustain excellence. Hence PFL should keep going and continue with efforts under EFQM Model.

- (f) The EFQM Excellence Model is a non-prescriptive framework based on nine criteria. **Five of these are 'Enablers' (Leadership, Strategy, People, Partnership and Resources, Processes) and four are 'Results' (Customer Results, People Results, Society Results, and Business Results).**

The 'Enabler' criteria cover **what an organisation does** and how it does. These simply deal with established objectives and corresponding strategies adopted as well as resources applied in order to attain them.

The 'Results' criteria cover **what an organisation achieves**. These simply deals with meeting the expectation of stakeholders (be it customers, society, employees, and shareholders) through generating result from them.

It is important to recognise that 'Results' are caused by 'Enablers' and 'Enablers' are improved using feedback from 'Results'.

Hence enablers and results together can help PAL Finance Limited to understand the cause and effect relationships between what they do and the results they achieve.

- Conceptually correct **brief explanation** is sufficient for each step.
- **Alternate points and reasoning** are also possible.

Question 2

JKL Ltd manufactures two parts "AXE" and "WYE" for Car Industry.

Particulars	AXE	WYE
Annual Production & Sales	1,20,000	70,000
Selling price per unit	103.80	150

Direct and indirect costs incurred on these two parts are as follows:

₹ in '000

Particular of cost	AXE	WYE	Total
Direct Variable Cost	5,040	4,200	9,240
Labour Cost (variable)	1,800	1,400	3,200
Direct Machining Cost (see note)*	900	750	1,650
Indirect Costs			
Machine set-up cost			516
Testing cost			2,910
Engineering cost			2,340

Note: Direct machining costs represents the cost of machine capacity dedicated to the production of each product. These costs are fixed and are not expected to vary over the long-run horizon.

Additional information is as follows:

Particulars	AXE	WYE
Production batch size	1,200 units	700 units
Set-up time per batch	40 hours	46 hours
Testing time per unit	4 hours	7 hours
Engineering cost incurred on each product	9,60,000	13,80,000

A foreign competitor has introduced a product very similar to "AXE". To maintain the company's share and profit, JKL Ltd. has to reduce the price to ₹90. The company calls for a meeting and comes up with a proposal to change the design of the product "AXE".

The expected effects of new design are as follows:

- Direct material cost is expected to decrease by ₹ 4 per unit.
- Labour cost is expected to decrease by ₹ 3 per unit.
- Machine time is expected to decrease by 20 minutes; previously it took 4 hours to produce 1 unit of AXE. The machine will be dedicated to the production of new design.
- Set-up time will be 38 hours for each set-up.
- Time required for testing each unit will be reduced by 1 hour.
- Engineering cost and batch size will remain unchanged.

Required

- (i) Using activity based costing, CALCULATE the full cost for parts "AXE" and "WYE" and mark-up on full cost per unit for part "AXE". **(5 Marks)**
- (ii) (a) What is the target cost per unit for new design to maintain the same mark-up percentage on full cost per unit as it had earlier ?
Assume cost per unit of cost drivers for the new design remains unchanged. **(2 Marks)**
- (b) Will the new design achieve the cost reduction target? **(5 Marks)**
- (iii) LIST four possible management actions that the JKL Limited should take regarding new design. **(4 Marks)**
- (iv) STATE the most suitable situation for the adoption of target costing. **(4 Marks)**

Answer

This question can be solved in **two alternative ways**–

In first alternative, it has been solved by “**computing**” Direct Material Cost, by reducing Direct Labour Cost from Direct Variable Cost (presuming there is no direct expense) – In this case direct material cost is ₹32,40,000 and ₹28,00,000 respectively. **In second alternative**, it has been solved by “**considering**” entire Direct Variable Cost as Direct Material Cost.

ALTERNATIVE-1

(i) Computation of "full cost per unit" using Activity Based Costing

Particulars	Basis of allocation	AXE (₹)	WYE (₹)
a. Direct material cost	Traceable hence direct	32,40,000	28,00,000
b. Direct labour cost	Traceable hence direct	18,00,000	14,00,000
c. Direct machine cost	Traceable hence direct	9,00,000	7,50,000
d. Machine set up cost	See working note 1	2,40,000	2,76,000
e. Testing cost	See working note 2	14,40,000	14,70,000
f. Engineering cost	Allocated	9,60,000	13,80,000
g. Total cost in ₹ (a) to (f)		85,80,000	80,76,000
h. Production/Sales Quantity (units)		1,20,000	70,000
Full cost per unit in ₹ (g)/ (h)		71.50	115.37

Mark up on full cost basis for Part AXE

Particulars	Amount per unit (in ₹)
Selling price	103.80
Less: Full cost computed above	71.50
Mark-up	32.30
Percentage of mark up on full cost $[(32.30/71.50) \times 100]$	45.17

Working Notes

1. Machine set-up cost per hour

Particulars	AXE	WYE
a. Production/ Sales quantity (units)	1,20,000	70,000
b. Batch size (units)	1,200	700
c. Number of batches (a)/(b)	100	100
d. Set-up time per batch (hours)	40	46
e. Total set-up hours (c)×(d)	4,000	4,600

Machine set up cost = ₹5,16,000

Total set-up hours for both the products (4,000+4,600) = 8,600 hours

Machine set-up cost per hour = ₹5,16,000 / 8,600 hours i.e., ₹60

Particulars	AXE	WYE
a. Total set-up hours	4,000	4,600
b. Machine set-up cost per hour	₹60	₹60
c. Allocation based upon cost driver's activity	₹2,40,000	₹2,76,000

2. Testing cost per hour

Particulars	AXE	WYE
a. Production/Sales Quantity (units)	1,20,000	70,000
b. Testing time per unit (hours)	4	7
c. Total testing time in hours (a)×(b)	4,80,000	4,90,000

Testing cost = ₹29,10,000

Total testing time in hours for both the products (4,80,000+4,90,000) = 9,70,000 hours

Testing cost per hour = ₹29,10,000 / 9,70,000 hours i.e., ₹3

Particulars	AXE	WYE
a. Total testing time in hours	4,80,000	4,90,000
b. Testing cost per hour	₹3	₹3
c. Allocation based upon cost driver's activity	₹14,40,000	₹14,70,000

(ii) (a) "Target Cost" of Part AXE after new design is implemented

Particulars	Amount per unit (in ₹)
Target price	90.00
Mark-up [(90×45.17)/145.17] (round-off)	28.00
Target cost	62.00

(b) Statement of per unit cost for new design of Part AXE

Particulars	Effect of new design	Cost per unit (in ₹)
Direct material cost	Existing cost per units is ₹27 (₹32,40,000/1,20,000), expected to reduce by ₹4 per unit	23
Direct labour cost	Existing cost per units is ₹15 (₹18,00,000/1,20,000), expected to reduce by ₹3 per unit	12

Direct machine cost	Existing cost per units is ₹7.5 (₹9,00,000/1,20,000), but no change as machine is dedicated	7.50
Machine set up cost	Revised per unit cost will be ₹2,28,000 (100 set-ups × 38 hours × ₹60) / 1,20,000 = ₹1.9	1.90
Testing cost	Revised per unit cost will be ₹3 per hours × 3 hours (4 hours – 1 hour) = ₹9	9
Engineering cost	Existing cost per units is ₹8 (₹9,60,000/1,20,000), and same will remain unchanged	8
Per unit cost for new design of Part AXE		61.4

Since the estimated cost per unit is ₹61.4, which is less than ₹62 i.e., target cost per unit, hence new design **abled to achieve the cost reduction target**.

(iii) **Possible Management Action**

1. **Value analysis/ engineering** can be applied to reduce the costs, while enhancing the value. Detailed functional analysis can also help in identification of scope of cost reduction while maintaining the quality. Standardisation of assembly or sub-parts can reduce material cost significantly. These activities might not be able to unlock entire value, hence **Kaizen** shall be practiced.
2. **Time and motion study** can be performed in order to redefine the direct labour time and related costs. Techniques like **5S, Cellular manufacturing** shall be applied.
3. Exploring possibility of **cost reduction in direct machining cost by using appropriate techniques**.
4. Identification of **non-value added** activities and eliminating them (or reduce them till residual level if elimination is not possible) in order to reduce overheads.
5. The expected selling price based on estimated cost of ₹61.4 per unit is ₹89.13 (61.4 + 45.17%). Introduce **sensitivity analysis** after implementation of new design to study the sales quantity changes in the price range of ₹90 to ₹89.13.

(iv) **Most suitable situation for adopting target costing**

Target costing is most useful in those situations **where the substantial amount of product costs are locked (committed) during the product design phase. This is a common feature of a product to be manufactured; but rare in case of services.** In the services area, such as consulting, the bulk of all activities can be reconfigured for cost reduction when services are being provided directly to the customer. In the services environment, the “design team” is still present but is more commonly concerned with streamlining the activities conducted by the employees providing the service, which can continue to be enhanced at any time, not just when the initial services process is being laid out.

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Business organisations, with following features expected to gain maximum from target costing;

1. **Assembly-oriented** industries;
2. Involved heavily with the **diversification** of the product lines;
3. Use **technologies** of factory automation, including computer-aided design, flexible manufacturing systems, office automation, and computer-aided manufacturing;
4. Have experienced **shorter product life cycles** where the pay-back for factory automation typically must be achieved in less than eight years;
5. Must develop **systems for reducing costs** during the planning, design, and development phases;
6. Are in process of **implementing management methods** such as just-in-time, value engineering.

ALTERNATIVE-2

(i) **Computation of “full cost per unit” using Activity Based Costing**

Particulars	Basis of allocation	AXE (₹)	WYE (₹)
a. Direct material cost	Traceable hence direct	50,40,000	42,00,000
b. Direct labour cost	Traceable hence direct	18,00,000	14,00,000
c. Direct machine cost	Traceable hence direct	9,00,000	7,50,000
d. Machine set up cost	See working note 1	2,40,000	2,76,000
e. Testing cost	See working note 2	14,40,000	14,70,000
f. Engineering cost	Allocated	9,60,000	13,80,000
g. Total cost in ₹ (a) to (f)		1,03,80,000	94,76,000
h. Production/Sales Quantity (units)		1,20,000	70,000
Full cost per unit in ₹ (g)/ (h)		86.50	135.37

Mark up on full cost basis for Part AXE

Particulars	Amount per unit (in ₹)
Selling price	103.80
Less: Full cost computed above	86.50
Mark-up	17.30
Percentage of mark up on full cost $[(17.30/86.50) \times 100]$	20.00

Working Notes**1. Machine set-up cost per hour**

Particulars	AXE	WYE
a. Production/ Sales quantity (units)	1,20,000	70,000
b. Batch size (units)	1,200	700
c. Number of batches (a)/(b)	100	100
d. Set-up time per batch (hours)	40	46
e. Total set-up hours (c)×(d)	4,000	4,600

Machine set up cost = ₹5,16,000

Total set-up hours for both the products (4,000+4,600) = 8,600 hours

Machine set-up cost per hour = ₹5,16,000 / 8,600 hours i.e., ₹60

Particulars	AXE	WYE
a. Total set-up hours	4,000	4,600
b. Machine set-up cost per hour	₹60	₹60
c. Allocation based upon cost driver's activity	₹2,40,000	₹2,76,000

2. Testing cost per hour

Particulars	AXE	WYE
a. Production/Sales Quantity (units)	1,20,000	70,000
b. Testing time per unit (hours)	4	7
c. Total testing time in hours (a)×(b)	4,80,000	4,90,000

Testing cost = ₹29,10,000

Total testing time in hours for both the products (4,80,000+4,90,000) = 9,70,000 hours

Testing cost per hour = ₹29,10,000 / 9,70,000 hours i.e., ₹3

Particulars	AXE	WYE
a. Total testing time in hours	4,80,000	4,90,000
b. Testing cost per hour	₹3	₹3
c. Allocation based upon cost driver's activity	₹14,40,000	₹14,70,000

(ii) (a) “Target Cost” of Part AXE after new design is implemented

Particulars	Amount per unit (in ₹)
Target price	90.00
Mark-up $[(90 \times 20) / 120]$ (round-off)	15.00
Target cost	75.00

(b) Statement of per unit cost for new design of Part AXE

Particulars	Effect of new design	Cost per unit (in ₹)
Direct material cost	Existing cost per units is ₹42 (₹50,40,000/1,20,000), expected to reduce by ₹4 per unit	38
Direct labour cost	Existing cost per units is ₹15 (₹18,00,000/1,20,000), expected to reduce by ₹3 per unit	12
Direct machine cost	Existing cost per units is ₹7.5 (₹9,00,000/1,20,000), but no change as machine is dedicated	7.50
Machine set up cost	Revised per unit cost will be ₹2,28,000 (100 set-ups × 38 hours × ₹60) / 1,20,000 = ₹1.9	1.90
Testing cost	Revised per unit cost will be ₹3 per hours × 3 hours (4 hours – 1 hour) = ₹9	9
Engineering cost	Existing cost per units is ₹8 (₹9,60,000/1,20,000), and same will remain unchanged	8
Per unit cost for new design of Part AXE		76.4

Since the estimated cost per unit is ₹76.4, which is less than ₹75 i.e., target cost per unit, hence new design **failed to achieve the cost reduction target**.

(iii) Possible Management Action

1. **Value analysis/ engineering** can be applied to reduce the costs, while enhancing the value. Detailed functional analysis can also help in identification of scope of cost reduction while maintaining the quality. Standardisation of assembly or sub-parts can reduce material cost significantly. These activities might not be able to unlock entire value, hence **Kaizen** shall be practiced.
2. **Time and motion study** can be performed in order to redefine the direct labour time and related costs. Techniques like **5S**, **Cellular manufacturing** shall be applied.

3. Exploring possibility of **cost reduction in direct machining cost by using appropriate techniques**.
4. Identification of **non-value added activities** and eliminating them (or reduce them till residual level if elimination is not possible) in order to reduce overheads.
5. The expected selling price based on estimated cost of ₹76.4 per unit is ₹91.68.(76.4 + 20%). Introduce **sensitivity analysis** after implementation of new design to study the sales quantity changes in the price range of ₹90 to ₹91.68.

(iv) **Most suitable situation for adopting target costing**

Target costing is most useful in those situations **where the substantial amount of product costs are locked (committed) during the product design phase. This is a common feature of a product to be manufactured; but rare in case of services.** In the services area, such as consulting, the bulk of all activities can be reconfigured for cost reduction when services are being provided directly to the customer. In the services environment, the “design team” is still present but is more commonly concerned with streamlining the activities conducted by the employees providing the service, which can continue to be enhanced at any time, not just when the initial services process is being laid out.

Business organisations, with following features expected to gain maximum from target costing;

1. **Assembly-oriented** industries;
2. Involved heavily with the **diversification** of the product lines;
3. Use **technologies** of factory automation, including computer-aided design, flexible manufacturing systems, office automation, and computer-aided manufacturing;
4. Have experienced **shorter product life cycles** where the pay-back for factory automation typically must be achieved in less than eight years;
5. Must develop **systems for reducing costs** during the planning, design, and development phases;
6. Are in process of **implementing management methods** such as just-in-time, value engineering.

Question 3

VEN Private Limited is a diversified agri-business company having three different business verticals - Dairy, Animal Feed and Crop Protection. The performance of each division is measured separately and staff members are rewarded accordingly.

Following information pertaining to the financials for the year ended 31st March, 2021 is furnished below :

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	Amount (₹)		
	Dairy	Animal Feed	Crop Protection
Revenue	6,80,00,000	10,62,50,000	6,00,00,000
Profit before interest and tax	60,10,000	63,77,500	57,66,000
Net book value of plant and equipment	5,65,25,000	7,43,75,000	2,62,50,000
Net Current Assets (Current Assets less Current Liabilities)	1,04,75,000	1,51,25,000	60,00,000

Additional information:

- Cost of capital of the company is 9% per annum.
- Profit before interest and tax as mentioned above has been arrived at after deducting head office expenses at 2% on the revenue of each division.
- Depreciation rate for plant and equipment is 15% on cost per annum.

The divisional performance of VEN is measured using the Return on Investment (ROI) and Residual Income (RI) methods based on controllable profits of each division. The staff members are rewarded based on these results. VEN calculates ROI and RI using Net Book Value of the plant and equipment at the reporting date.

The manager of Animal Feeds division claims that their division is the best performing division of the company.

Required

- (a) CALCULATE the Return on Income and Residual Income for each division and explain the validity of the claim made by the manager of Animal Feeds division. **(7 Marks)**
- (b) It has been proposed to expand the business of Dairy Division by venturing into manufacture of frozen desserts. This would require additional investment in plant and equipment of ₹ 1,75,00,000 which will generate a contribution of ₹ 95,00,000 per annum. Annual fixed cost of the division will increase by ₹ 8,50,000 (excluding depreciation). Net current assets of this division will increase by ₹ 25,00,000 due to acceptance of this proposal. EVALUATE the proposal of expansion of the Dairy Division for a period of one year and advise the management on the acceptance of the project using ROI and RI criteria. **(5 Marks)**
- (c) Return on Investment (ROI) improves with the age of the asset. EXPLAIN with calculations how this happens using the proposal of the dairy division. **(2 Marks)**
- (d) In addition to the financial performance measures, the management of VEN wishes to apply Non-financial Performance Indicators (NPMI) for three functions; (i) management of human resources, (ii) product and service quality and (iii) brand awareness and company profile. EXPLAIN the scope of Non-Financial Performance Indicators with regard to these three functions. **(6 Marks)**

Answer

Question specifies “VEN calculates ROI and RI using Net Book Value of plant and equipment at the reporting date”. This question has been solved in two alternatives ways– In **first alternative**, ROI and RI have been computed by **including Net Current Assets** also. In **second alternative**, ROI and RI have been computed by **ignoring the Net Current Assets**.

ALTERNATIVE-1**(a) Calculation of ROI (Return on Investment)/ RI (Residual Income)****(Amount in ₹)**

Particulars	Dairy	Animal Feed	Crop Protection
a. Profit before interest and tax	60,10,000	63,77,500	57,66,000
b. Revenue	6,80,00,000	10,62,50,000	6,00,00,000
c. Head office expenses [@2% of (b)]	13,60,000	21,25,000	12,00,000
d. Controllable operating profit (a)+(c)	73,70,000	85,02,500	69,66,000
e. Net book value of plant and equipment	5,65,25,000	7,43,75,000	2,62,50,000
f. Net current assets	1,04,75,000	1,51,25,000	60,00,000
g. Investment (e)+(f)	6,70,00,000	8,95,00,000	3,22,50,000
h. ROI [(d)/(g)×100]	11%	9.50%	21.6%
i. Required return [@9% of (g)]	60,30,000	80,55,000	29,02,500
j. RI [(d)-(i)]	13,40,000	4,47,500	40,63,500

The claim made by the manager of animal feeds division is **invalid** because it registered worst performance among the three divisions under both the criteria. ROI of animal feeds division is 9.50%, which is less than (11.00% and 21.60%) other two divisions, whereas RI is ₹4,47,500 which is also less than (₹13,40,000 and ₹40,63,500) both other divisions.

It is important to note that Animal Feed Division earns the highest profit, however **since its investment is high** the ROI and RI are the lowest compared to the other divisions.

(b) Evaluation of Expansion Proposal – Dairy Division**ROI/ RI for proposed expansion (for first year)**

Particulars	Amount in ₹
a. Additional investment in plant and equipment	1,75,00,000
b. Depreciation for first year on the above investment (15%)	26,25,000

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c. Net book value of additional investment in plant and equipment at reporting date (a-b)	1,48,75,000
d. Additional net current assets	25,00,000
e. Total additional investment (c)+(d)	1,73,75,000
f. Additional contribution	95,00,000
g. Additional fixed cost	8,50,000
h. Net addition to earning (f)-(g)-(b)	60,25,000
i. ROI [(h)/(e)×100]	34.68%
j. Required return [9% of (e)]	15,63,750
k. RI [(h)-(j)]	44,61,250

Advise

ROI Criteria – Management of VEN private limited **must expand** the business of dairy division by venturing into manufacturing of frozen desserts, because the proposed expansion expected to generate ROI at rate of **34.68%**, which is **not only more than existing ROI of dairy division (11%) but also more than overall ROI as well** (because among the three division the maximum ROI generated by crop protection division i.e., 21.6%).

RI Criteria – Management of VEN private limited **must expand** the business of dairy division by venturing into manufacturing of frozen desserts, because the proposed expansion expected to generate additional RI of ₹ **44,61,250**.

Alternative Presentation

Particulars	Existing (Amount in ₹)	Frozen Deserts Amount in ₹	After Expansion (Amount in ₹)
a. Investment in plant and equipment [Net]	5,65,25,000	1,48,75,000	7,14,00,000
b. Net current assets	1,04,75,000	25,00,000	1,29,75,000
c. Total Investment	6,70,00,000	1,73,75,000	8,43,75,000
d. Controllable Profit	73,70,000	60,25,000	1,33,95,000
e. ROI [(d)/(c)×100]	11.00%	34.68%	15.88%
f. Required return [9% of (c)]	60,30,000	15,63,750	75,93,750
g. RI [(d)-(f)]	13,40,000	44,61,250	58,01,250

Management of VEN private limited **must expand** the business of dairy division by venturing into manufacturing of frozen desserts, because the proposed expansion **expected to increase dairy division's ROI to 15.88%, which is more than existing ROI of dairy division (11%)**. Similarly, proposed expansion expected to increase RI to ₹ 58,01,250.

(c) **ROI improves with age of the assets**

Since ROI is rate of earning as percentage of investment, hence while assets getting older the amount of investment reduced; resultantly **if same productivity or efficiency is maintained** then ROI improves. Same can be seen through calculations below that ROI improves from 34.68% in first year to 40.85%, and 49.69% respectively in second and third year.

ROI for proposed expansion over years (Amount in ₹, round off to nearest rupee)

Particulars	Second Year	Third Year
a. Plant and equipment at beginning of year	1,48,75,000	1,22,50,000
b. Depreciation for year on the above plant and equipment (15%)	26,25,000	26,25,000
c. Net book value of plant and equipment at reporting date (a)-(b)	1,22,50,000	96,25,000
d. Net current assets (assumed to be constant)	25,00,000	25,00,000
e. Total relevant investment (c)+(d)	1,47,50,000	1,21,25,000
f. Contribution (assumed to be constant)	95,00,000	95,00,000
g. Fixed cost (assumed to be constant)	8,50,000	8,50,000
h. Net addition to earning (f)-(g)-(b)	60,25,000	60,25,000
i. ROI [(h)/(e)×100]	40.85%	49.69%

- (d) Non-Financial Performance Indicators (NFPIs) are sustainable action-based indicators. For example, employee training will increase the profit & let them feel empowered, putting effort in research and development will result in a high brand image & high intellectual property rights. Hence **for being sustainable rather being only profitable** an organisation needs to include NFPIs as part of performance matrix in addition to financial performance Indicators. Although the scope of NFPIs substantially depends upon width and depth of organisation's objective, operations and strategies, but generically VEN Private Limited can consider–

Human resources management

Superior performance comes from superior processes. Who actually devise and execute superior processes to build an organisation with competitive advantage? It is the people (human resources) and their efforts. Hence human resources are a significant element for success of any organisation. *If they performance well, then entire organisation*

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automatically performs well; hence measures such as staff turnover, absenteeism, job satisfaction, and offer letter accepted shall be part of performance metrics.

Product and service quality

What make any business **distinct from others**, what are the sources of competitive advantage? *It is substantially the value which its products or services capable to create for the users; and quality is important determinant of value. Simply saying quality is conformance to need to user. Hence the following performance measures, owing to quality shall be part of performance metrics*

1. What are the functions that product or service offers and *how much value* these are capable to generate?
2. Where do our product stand in market in *comparison that of competitors*, especially rivals?
3. Is product capable to generate further *superior performance and scope of innovation*?

Brand awareness and company profile (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, stakeholder’s expectation and organisation ability to meet them, and factors like patents and trademarks etc.

ALTERNATIVE-2

(a) Calculation of ROI (Return on Investment)/ RI (Residual Income)

(Amount in ₹)

Particulars	Dairy	Animal Feed	Crop Protection
a. Profit before interest and tax	60,10,000	63,77,500	57,66,000
b. Revenue	6,80,00,000	10,62,50,000	6,00,00,000
c. Head office expenses [@2% of (b)]	13,60,000	21,25,000	12,00,000
d. Controllable operating profit (a)+(c)	73,70,000	85,02,500	69,66,000
e. Net book value of plant and equipment	5,65,25,000	7,43,75,000	2,62,50,000
f. ROI [(d)/(e)*100]	13.04%	11.43%	26.54%
g. Required return [@9% of (e)]	50,87,250	66,93,750	23,62,500
h. RI [(d)-(g)]	22,82,750	18,08,750	46,03,500

The claim made by the manager of animal feeds division is invalid, because it registered worst performance among the three division under both the criteria. ROI of animal feeds division is 11.43%, which is less than (13.04% and 26.54%) other two divisions, whereas RI is ₹18,08,750 which is also less than (₹22,82,750 and ₹46,03,500) both other divisions.

It is important to note that Animal Feed Division earns the highest profit, however **since its investment is high** the ROI and RI are the lowest compared to the other divisions.

(b) Evaluation of expansion proposal – Dairy Division

ROI/ RI for proposed expansion (for first year)

Particulars	Amount in ₹
a. Additional investment in plant and equipment	1,75,00,000
b. Depreciation for first year on the above investment (15%)	26,25,000
c. Net book value of additional investment in plant and equipment at reporting date (a-b)	1,48,75,000
d. Additional contribution	95,00,000
e. Additional fixed cost	8,50,000
f. Net addition to earning (d)-(e)-(b)	60,25,000
g. ROI [(f)/(c)×100]	40.50%
h. Required return [9% of (c)]	13,38,750
i. RI [(f)-(h)]	46,86,250

Advise

ROI Criteria – Management of VEN private limited **must expand** the business of dairy division by venturing into manufacturing of frozen desserts, because the proposed expansion expected to generate ROI at rate of **40.50%**, which is not only more than existing ROI of dairy division (13.04%) but also more than overall ROI as well (because among the three division the maximum ROI generated by crop protection division i.e., 26.54%)

RI Criteria – Management of VEN private limited **must expand** the business of dairy division by venturing into manufacturing of frozen desserts, because the proposed expansion expected to generate additional RI of **₹46,86,250**.

Alternative Presentation

Particulars	Existing (Amount in ₹)	Frozen Deserts Amount in ₹	After Expansion (Amount in ₹)
a. Investment in plant and equipment [Net]	5,65,25,000	1,48,75,000	7,14,00,000
b. Total Investment	5,65,25,000	1,48,75,000	7,14,00,000
c. Controllable Profit	73,70,000	60,25,000	1,33,95,000
d. ROI [(c)/(b)×100]	13.04%	40.50%	18.76%
e. Required return [9% of (b)]	50,87,250	13,38,750	64,26,000
f. RI [(c)-(e)]	22,82,750	46,86,250	69,69,000

Management of VEN private limited **must expand** the business of dairy division by venturing into manufacturing of frozen desserts, because the proposed expansion **expected to increase dairy division's ROI to 18.76%, which is more than existing ROI of dairy division (13.04%)**. Similarly, proposed expansion expected to increase RI to **₹69,69,000**

(c) ROI improves with age of the assets

Since ROI is rate of earning as percentage of investment, hence while assets getting older the amount of investment reduced; resultantly **if same productivity or efficiency is maintained** then ROI improves. Same can be seen through calculations below that ROI improves from 40.50% in first year to 49.18%, and 62.60% respectively in second and third year.

ROI for proposed expansion over years (Amount in ₹, round off to nearest rupee)

Particulars	Second Year	Third Year
a. Plant and equipment at beginning of year	1,48,75,000	1,22,50,000
b. Depreciation for year on the above plant and equipment (15%)	26,25,000	26,25,000
c. Net book value of plant and equipment at reporting date (a)-(b)	1,22,50,000	96,25,000
d. Contribution (assumed to be constant)	95,00,000	95,00,000
e. Fixed cost (assumed to be constant)	8,50,000	8,50,000
f. Net addition to earning (d)-(e)-(b)	60,25,000	60,25,000
g. ROI [(f)/(c)×100]	49.18%	62.60%

(d) Answer to part (d) will remain same as in Alternative 1.

Question 4

(a) "INS" Insurance offers a wide range of insurance covers for individuals including a comprehensive range of term insurance products. It is planning to introduce the following changes:

- (i) Option of paying insurance premium in installments-monthly, quarterly, or half yearly as well as annually. "INS" adds a surcharge of ₹ 50 per payment if the customers choose a mode other than annual payment.
- (ii) An incentive to the customers at 0.75% of the premium amount or ₹ 300 (whichever is lower) per payment if the customers opt for ECS facility.

DISCUSS, whether the above incentives, discount, or surcharges 'INS' intended to introduce are justified or not. **(5 Marks)**

OR

ABC & Associates, a law firm has recently undertaken an analysis of its activities, but is uncertain which activity relates to which part of the firm's Value Chain.

Consider the following lists of activities within ABC and various Value Chain classifications.

Activity		Value Chain Classification	
A	Dealing with claims of negligence by customer	1	Inbound logistics
B	Central control system that ensures each case is independently reviewed	2	Service
C	Attending court cases	3	Infrastructure
D	Receiving strong data from client meetings	4	Operations

You are required to:

- (i) DEFINE the "Value Chain". **(1 Mark)**
 - (ii) IDENTIFY which activity relates to which dimension by pairing the appropriate letter and number. **(4 Marks)**
- (b) Pertaining to environmental management and sustainability, there are following two situations:

Situation - I

Package food manufacturer XYZ Limited was ordered to submit a yearly report to the Ministry of Environment and Forests on activities, which contains information concerning collection, recovery and recycling of packaging waste, fulfillment of the targets, volume of recovered and recycled packaging waste by type of material and declaration that all compulsory contributions and taxes have been paid.

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Situation - II

ABC Ltd. has achieved a 30% reduction of energy consumption through its "Go Renewable" Initiative. For the company, a 30% reduction represents a cost saving of about ₹ 25,00,000.

You are required to read above situations and EXPLAIN:

- (1) The risk exposor of XYZ Ltd.
 - (2) How focusing on environmental sustainability provides opportunity to ABC Ltd. for reducing costs ? **(5 Marks)**
- (c) Coral Electronics (P) Limited with its headquarters in India manufactures and sells a 'tablet computer' with the brand name 'Iris 10'. The company has three divisions, each of which is located in a different country :

Malaysia division	manufactures motherboard, LCD (Liquid Crystal Display) and touch sensor panel
Singapore division	assembles tablet computers using locally manufactured parts, along with the motherboard, LCD (Liquid Crystal Display) and touch sensor panel which it receives from the Malaysia division
India division	packages and distributes tablet computer 'Iris 10'.

Each division is run as a profit center. The costs for the work done in each division for a single tablet computer are as follows:

Division	Variable Cost (per unit)	Fixed Cost (per unit)
Malaysia division	30 MY ringgit	65 MY ringgit
Singapore division	35 SG dollar	47 SG dollar
India division	₹ 635	₹ 1,600

The Income tax rates on the division's operating income are:

Malaysia division	34%
Singapore division	17%
India division	25%

Each tablet computer 'Iris 10' is sold to retail stores in India for ₹ 19,000. Assume that the current foreign exchange rates are as follows:

1 MY ringgit = ₹ 17

1 SG dollar = ₹ 50

Further, both the Malaysia and Singapore divisions sell part of their production under a private label. The Malaysia division sells the comparable motherboard, LCD (Liquid Crystal

Display) and touch sensor panel package used in each tablet computer 'Iris 10' to a Malaysian manufacturer for 147 MY ringgit. The Singapore division sells the comparable tablet computer to a Singaporean distributor for 134 SG dollar.

Required

- (i) CALCULATE the after-tax operating income per unit earned by each division under the following transfer pricing methods: (a) market price and (b) 200% of full cost.

(Income taxes are not included in the computation of the cost based transfer price.)

(9 Marks)

- (ii) Which transfer-pricing method will maximize the after-tax operating income per unit of Coral Electronics ?

(1 Mark)

Answer

- (a) These charges basically reflect the *opportunity cost of capital* for "INS" insurance.

If the customer makes "one" (full) annual dues, the firm will need less money to finance its working capital and hence saving in interest. By adding a surcharge for half yearly, quarterly or monthly payments, the firm is basically *recovering the cost of raising working capital*.

In addition, the firm has to *process only one receiving transaction* rather than two, four or twelve.

Similarly, ECS facility *reduces the transactions costs* for the firm by smoothing timely withdrawals -- saving of these costs is justification for the incentives.

OR

Porter describes the Value Chain as "internal processes or activities a company performs to design, produce, market, deliver and support its product".

Value Chain encompass the full range of activities that are required and performed to bring a products or services from its conception to the point when these are consumed or used.

Porter defines "Value Chain" as a representation of a firm's value-adding activities, based on its pricing strategy and cost structure.

Identification of Activity and Related Dimension by Pairing

Activity	Value Chain Classification	Reason
A. Dealing with claims of negligence by customer	2. Services	Services are the activities related to maintaining the value of your product or service to your customers, once it's been purchased.

B. Central control system that ensures each case is independently reviewed	3. Infrastructure	Infrastructure are a company's support systems , and the functions that allow it to maintain daily operations.
C. Attending court cases	4. Operations	Operation are the transformation activities that change inputs into outputs that are sold to customers . (representing them in court of law)
D. Receiving strong data from client meetings	1. Inbound Logistics	Inbound logistics are all the processes related to receiving , storing, and distributing inputs internally. (to prepare the case)

- (b) (1) Organisations increasingly have to demonstrate that they are systematically managing all of their risks, including environmental risks as well, i.e., **the risks that arise as consequences of impacts that an organization made on the environment through its actions and decisions**. In order to manage the any risk (including environmental risks), identification of risk followed by detailed assessment (of exposure in term of impact and probability) thereof is essential so that best response can be identified, out of possible responses based upon implications associated with each alternate.

By assessing the environmental risks associated with their activities, processes, product, and services, XYZ limited can identify their potential legal and business exposure. Non-compliances can cause enormous financial impacts, such as fines, penalties, legal costs, and damages.

Thus, XYZ limited is exposed to environmental risks.

- (2) Focusing on environmental sustainability will often provide **opportunities for reducing costs**. For example, reducing carbon impacts often results in lower energy consumption hence save the energy costs. Similarly, programmes for reducing wastes **improve environmental footprint** and **reduce operating costs**. ABC Ltd. achieved cost saving INRs 25 lac through 'Go Renewable' initiative by reducing energy consumption. This saving represents only 30% reduction, further reduction may be possible.

While reducing environmental impacts, the practice of focusing on environmental sustainability also eliminate (if not eliminate completely then bring to possible residual level) internal and external failure costs, especially the **penalties and levies**; hence **reduce costs**.

Focusing on environmental sustainability involves making investments in developing clean technologies and more energy-efficient products and processes, which apart from saving the monetary resources for organisation, also capable to be patented and then sold to other organizations, hence **open up an additional source of income**. ABC Ltd. may earn carbon credit for attaining energy-efficiency (reducing carbon impacts through lower energy consumption) and may realise the same to actually generating revenue.

(c)

This question has been solved by considering two alternative ways of **computation of "full cost"** for the purpose of computation of transfer price.

First way– "Full Cost" equals to fixed cost and variable cost of the division including transfer price (if any). **Second way** – "Full Cost" equals to fixed cost and variable cost of the division including actual cost of internal transfer (if any).

(i) 1 SGD= 50 INR; 1MYR = 17 INR; 1 SGD = 50/17 MYR

(a) Transfer Price– Market Price

	Malaysian Division (MYR)	Singapore Division (SGD)	India Division (INR)
TP-Market Price/ Selling Price (India)	147.00	134.00	19,000.00
Cost of Motherboard, LCD	-	49.98	-
Assembled tablet computer	-	-	6,700.00
Variable Cost	30.00	35.00	635.00
Fixed Cost	65.00	47.00	1,600.00
Operating Income (before tax)	52.00	2.02	10,065.00
Less: Income Tax @ 34%/ 17%/25%	17.68	0.34	2,516.25
Operating Income after tax	34.32	1.68	7,548.75
Profit in INR	583.44	83.83	7,548.75
			8,216.02

(b) Transfer Price– 200% of full cost

	Malaysian Division (MYR)	Singapore Division (SGD)	India Division (INR)
TP-200% of full cost/ Selling Price (India)	190.00	293.20	19,000.00
Cost of Motherboard, LCD	-	64.60	-
Assembled tablet computer	-	-	14,660.00
Variable Cost	30.00	35.00	635.00
Fixed Cost	65.00	47.00	1,600.00
Operating Income (before tax)	95.00	146.60	2,105.00
Less: Income Tax @ 34%/ 17%/25%	32.30	24.92	526.25
Operating Income after tax	62.70	121.68	1,578.75
Profit in INR	1,065.90	6,083.90	1,578.75
			8,728.55

Note- full Cost equals to fixed cost and variable cost of the division including **transfer price** (if any)

ALTERNATIVE

Transfer Price– 200% of full cost

	Malaysian Division (MYR)	Singapore Division (SGD)	India Division (INR)
TP-200% of full cost/ Selling Price (India)	190.00	228.60	19,000.00
Cost of Motherboard, LCD	-	64.60	-
Assembled tablet computer	-	-	11,430.00
Variable Cost	30.00	35.00	635.00
Fixed Cost	65.00	47.00	1,600.00
Operating Income (before tax)	95.00	82.00	5,335.00
Less: Income Tax @ 34%/ 17%/25%	32.30	13.94	1,333.75
Operating Income after tax	62.70	68.06	4,001.25
Profit in INR	1,065.90	3,403.00	4,001.25
			8,470.15

Note- full Cost equals to fixed cost and variable cost of the division including **actual cost of internal transfer** (if any).

- (ii) Transfer Price 200% of full cost will maximize the after-tax operating income per unit of Coral Electronics.

Alternative Presentation- Statement of profit for foreign divisions **may also be prepared in Indian currency** by converting the figures using the given exchange rate.

Question 5

- (a) DAC manufactures 'motor rotors' in two operations: casting and bonding. Following information is furnished:

	Casting	Bonding
Annual capacity	75,000 units	60,000 units
Annual production	60,000 units	60,000 units
Fixed operating costs (excluding direct materials)	₹ 2,40,00,000	₹ 1,50,00,000
Fixed operating costs per unit produced (₹ 2,40,00,000/ 60,000 units, ₹ 1,50,00,000/ 60,000 units)	₹ 400	₹ 250

Each motor rotor sells for ₹ 3,600 and has direct material costs of ₹ 1,600 incurred at the start of the casting operation. DAC has no other variable costs. DAC can sell whatever output it produces. The following requirements refer only to the preceding data. There is no connection between the requirements.

You are required to consider the following situations independently:

- (i) DAC is considering using some modern jigs and tools in the bonding operation that would increase annual bonding output by 750 units. The annual cost of these jigs and tools is ₹11,25,000. Should DAC acquire these tools? Show your calculations. **(1 Mark)**
- (ii) The production manager of the casting department has submitted a proposal to do faster setups that would increase the annual capacity of the casting department by 7,500 units and would cost ₹1,87,500 per year. Should DAC implement the change? Show your calculations. **(1 Mark)**
- (iii) An outside contractor offers to do the bonding operation for 9,000 units at ₹500 per unit, double the ₹250 per unit that it costs DAC to do the bonding in-house. Should DAC accept the subcontractor's offer? Show your calculations. **(2 Marks)**
- (iv) XYZ company offers to do casting process for 3,000 units at ₹200 per unit, half the ₹400 per unit that it costs DAC to do the casting process in-house. Should DAC accept XYZ company's offer? Show your calculations. **(2 Marks)**
- (v) Assume, DAC produces 1,500 defective units at the casting operation. What is the cost to DAC of the defective items produced? EXPLAIN your answer briefly. **(2 Marks)**
- (vi) Assume, DAC produces 1,500 defective units at the bonding operation. What is the cost to DAC of the defective items produced? EXPLAIN your answer briefly. **(2 Marks)**
- (b) SVS, is a company in the agri-food industry with four individual business groups. The company has an annual turnover of ₹50,000 crores and 15,000 employees. Its primary customers are retailers and SVS has production and sales worldwide. SVS is organized as a co-operative and is primarily owned by farmers who are in fact the co-operative members. The co-operative members are not only owners of SVS - they are also its suppliers. In fact, the owners are obliged to supply the bulk of their production to SVS. The agri-food industry is characterized by a wave of consolidations and co-operatives are actively taking part in this process. SVS is also active in this consolidation process and the company itself is a result of several mergers. In a co-operative, any net income for the year is either distributed to the farmers in proportion to the amount (or value) of the goods they supplied to the co-operative or it is transferred to equity. The distributions from the co-operative are of utmost importance to the farmers, as such distributions often constitute their main or only source of income. Farmers subjectively compare their co-operatives with alternative trading partners and their own farming operations with those of other farms. If they are dissatisfied, co-operative members can switch to a better-performing competitor to gain access to higher income.

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SVS started changing its budgeting process recently, in connection with the implementation of a new Enterprise Resource Planning (ERP) system. At the time, the company decided to closely examine several business processes, including its planning and budgeting procedures. During that analysis, the Beyond Budgeting principles emerged as a relevant idea.

Required

EXPLAIN briefly the concept of "Beyond Budgeting" and its characteristics. DISCUSS how the principles of "Beyond Budgeting" will promote a cultural framework that is suitable for the modern dynamic business environment. (10 Marks)

Answer

- (a) (i) Bonding is a **bottleneck operation**. Therefore, producing 750 more units will generate additional throughput contribution and operating income.
- Increase in throughput contribution $(₹3,600 - ₹1,600) \times 750 = ₹15,00,000$
- Incremental costs of the Jigs and tools = ₹11,25,000
- Net benefits of investing in Jigs and tools = ₹3,75,000
- DAC should invest in the modern Jigs and tools** because the benefit of higher throughput contribution of ₹15,00,000 exceeds the cost of ₹11,25,000.
- (ii) The Casting department has excess capacity and is **not a bottleneck operation**. Increasing its capacity further will not increase throughput contribution. There is, therefore, no benefit from spending ₹1,87,500 to increase the Casting department capacity by 7,500 units. **DAC should not implement the change to do setup faster.**
- (iii) Bonding is a **bottleneck operation**. Therefore, getting an outside contractor to produce 9,000 units will increase throughput contribution:
- Increase in throughput contribution $(₹3,600 - ₹1,600) \times 9,000 = ₹1,80,00,000$
- Incremental contracting costs $₹500 \times 9,000 = ₹45,00,000$
- Net benefit of contracting 9,000 units of Bonding = **₹1,35,00,000**
- DAC should contract with an outside contractor** to do 9,000 units of Bonding at ₹500 per unit because the benefit of higher throughput contribution of ₹1,80,00,000 exceeds the cost of ₹45,00,000. The fact that the cost of ₹500 per unit is double DAC's Bonding cost of ₹250 per unit is irrelevant.
- (iv) Operating costs in the Casting department of ₹2,40,00,000 or ₹400 per unit, are fixed costs. DAC will not save any of these costs by subcontracting Casting of 3,000 units to XYZ. Total costs will be greater by ₹6,00,000 (₹200 per unit \times 3,000 units) under the subcontracting alternative. Casting more 'motor rotors' will not increase

throughput contribution, which is constrained by the Bonding capacity. **DAC should not accept XYZ's offer**. The fact that XYZ's cost of Casting per unit are half of what it costs. DAC in house is irrelevant.

- (v) Cost of defective units at Casting operation which is not a bottleneck operation is the loss in direct materials of ₹1,600 per unit. Producing 1,500 units of defectives does not result in loss of throughput contribution. Despite the defective production, Casting can produce and transfer 60,000 units to Bonding. **Therefore, cost of 1,500 defective units at the Casting operation is ₹1,600×1,500 = ₹24,00,000.**
- (vi) A defective unit produced at the bottleneck Bonding operation costs DAC material costs plus the opportunity cost of lost throughput contribution. Bottleneck capacity not wasted in producing defective units could be used to generate additional sales and throughput contribution. Cost of 1,500 defective units at the Bonding operation is:

Loss of direct materials ₹1,600×1,500= ₹24,00,000

Foregone throughput contribution (₹3,600-₹1,600) × 1,500 = ₹30,00,000

Total cost of 1,500 defective units ₹54,00,0000

Alternatively, the cost of 1,500 defective units at Bonding operation can be calculated as the lost revenue of ₹3,600× 1,500 = ₹54,00,000. This line of reasoning takes the position that direct material cost of ₹1,600 × 1,500 = ₹24,00,000 and all fixed operating costs in the Casting and Bonding operations would be incurred any way whether a defective or good unit is produced. The cost of producing a defective unit is the revenue lost ₹54,00,000.

- (b) **The concept of “Beyond Budgeting” lies in the background of drawbacks of Traditional Budgeting.** Until the last decade, organizations had an annual budget exercise that would spell out the business goals for the upcoming year and performance expectations to meet these goals. This was made based on past performance, previous year budget modified for any required changes for the current upcoming year.

Traditional budgeting had the following drawbacks:

1. Not flexible and robust to keep up with changing business environment. The budget is prepared once a year based on information available at that point in time. Targets and performance measures are based on past performance and may even be based on redundant data.
2. Invited “gaming” the system: Targets set based on past performance are constrained because the budget would *not factor for any changes happening* in the real-world business environment. Companies however use the traditional budget as a tool to measure performance. In order to meet the “fixed targets” *very often improper practices are adopted to meet the targets*. This harms business.

3. Focus on cost reduction and not value creation: If not factored in the budget, many proposals are not adopted for the fear of over-running the costs. However, sometimes these proposals may be required to survive or value creation in a changing environment even if not budgeted for. This *stifles innovation and restricts employee performance*.
4. Costly and Time-consuming exercise: It involves the effort of management accountants, management at all levels of the company to gather information to prepare budgets. Time and cost are spent on this exercise to develop a tool that may not be handy in an ever-changing business environment.

To address these issues, the concept of “Beyond Budgeting” was proposed by Hope and Fraser in 2003. It aims at building agility in the business that will help it function in an ever-changing environment.

1. It is a more *adaptive process* than traditional budgeting.
2. It is a more *decentralized process* unlike traditional budgeting where the process is centralized and driven by the leaders alone.

This is suitable for industries where there is rapid change in the business environment or undergoing radical change. It is also useful where companies are looking to create value on a continuous basis.

The Characteristics of Beyond Budgeting are:

1. Use of rolling budgets that also include key performance indicators (KPIs).
2. Benchmarking can be incorporated in budgets.
3. Focus on managing future results and not past performance.
4. Allows the operational management to react to the environment.
5. Encourages innovation.
6. More timely allocation of resources.

Relevance to SVS company, the case study at hand: SVS is a large global company having a ₹50,000 crore turnover and an employee base of 15,000. The global nature of its business in addition to consolidations and mergers within its industry creates volatility in business environment. A traditional annual budget based on past performance may not be completely relevant to SVS for its present use. Rolling budgets, linking KPIs to corporate strategy, external benchmarking, timely allocation of resources for operations, focus on future (not past) results heralds the need for “Beyond Budgeting”. It builds agility in the company’s operations that will help it keep up with the competition.

- Beyond Budgeting is based on 12 principles, 6 “Leadership” based principles and 6 “Management Process” principles.
- The 6 Leadership Principles are:
1. Purpose: Engage and inspire people around bold and noble causes and not on short term goals.

2. Values: Govern through shared values and sound judgement and not through detailed rules and regulations
 3. Transparency: Make information open for self-regulation, innovation, learning and control. Do not restrict information.
 4. Organization: Cultivate a strong sense of belonging and organize around accountable teams. Avoid hierarchical control and bureaucracy.
 5. Autonomy: Trust people with freedom to act. Don't punish everyone if someone should abuse it.
 6. Customers: Connect everyone's work with customer needs. Avoid conflict of interest.
- The 6 Management Process Principles are:
1. Rhythm: Organize management process dynamically against business rhythms and events. Not around the calendar year only.
 2. Targets: Set directional, ambitious and relative goals. Avoid fixed and cascaded targets.
 3. Make planning and forecasting lean and unbiased process. Not rigid and political exercises.
 4. Resource Allocation: Foster a cost-conscious mindset and make resources available as needed, not through detailed annual budget allocations.
 5. Performance evaluation: Evaluate performance holistically and with peer feedback for learning and development. Not based on measurement only and not for rewards only.
 6. Rewards: Reward shared success against competition not against fixed performance contracts.

Discussion about how principles of "Beyond Budgeting" will promote a cultural framework that is suitable for the modern dynamic business environment

- (1) **Targets and Rewards: Fixed targets** set to measure performance force managers to seek easily achievable target, game the system just to meet the target in order to get successful performance report and its rewards. This **short-term outlook** hurts the business and does not create a conducive environment for growth. To **eliminate fixed goals**, "Beyond Budgeting" model suggests setting the goals / benchmark on achieving **better than the competitor** or any other external benchmark. **Ownership of goals is transferred to team** with the idea of achieving "Stretch goals". Stretch goals is a concept aimed at relative improvement.

Instead of "Pay for Performance" that results in manipulation of results, "Beyond Budgeting" aims at evaluation and reward based on "**relative performance**" **against external benchmark**. This is assessed in hindsight, **rewarded to the team effort** rather than an individual. If the team has performed well given the business competition and environment, it can be rewarded appropriately in "hindsight". **For example**, in a situation of glut in the market, a sales increase of 5% may be viewed as very good performance and rewarded well. In a situation of boom in the market, a sales increase of 5% **against the competitor's 15%** will not be sufficient. This assessment of performance of the team is made in retrospect. Hence payment is now for "relative performance".

- (2) **Planning and Control:** Today's business environment requires planning to be a **continuous process and not an annual exercise**. The teams at operational level are involved in strategy planning and decision making. Based on the goals, key performance indicators and action plans a periodic review of their performance against these metrics helps them assess if the goals have been met. Changes are made to the goals and key performance indicators to suit the current real-world scenario. Senior management may keep reserves in order **to invest in any sudden opportunities that might arise**. They may also exit certain projects to limit losses.
- (3) **Resource allocation and coordination:** Traditional budgets focus on costs cutting. Hence, if a resource has not been factored into the budget, there may not be any permission given to acquire it, just so that the budget target can be met. This stifles many opportunities. Moreover inflating budgets, getting approval for extra money in the budgets and then spending it so as to be allocated a similar amount next year, results in wastage of resources. However, "Beyond Budgeting" **makes the resource available as needed**. They may set the key performance indicator as a benchmark for resource allocation. **For example**, there can be an expense to income ratio so that each asset that is bought may be measured against the income it generates.

Beyond Budgeting encourages **dynamic co-ordination among teams** within the organization. Service level agreements are used to define the quality of service or product being provided. **Responsibilities are clearly defined with the ultimate goal of catering to the customer's needs**. The agreements can also allow for short term adjustments to meet changing customer demands. Thus resources are used in a coordinated fashion to ultimately meet the customer's needs.

- (4) **Organizational Culture:** The focus of Beyond Budgeting is on **value creation** to compete in the market. Operational managers do not restrict to budget limits but focus on achieving the **key performance indicator metrics**. Due to **customer focus**, internal rivalry is reduced, and the focus is to beat the competition. Therefore, information and resources flow dynamically throughout the organization. This builds team spirit and motivates to create value for the company.

"Argument"

Beyond Budgeting is one of the many tools to help businesses remain robust. While it is useful, **it may not be applicable in all situations**. For example, in the given case study of SVS, the farmers are the owners and suppliers of the company. Net income for the year is either transferred to the framers in proportion of the goods they supplied to the co-operative or is transferred to equity. This forms the **main source of income for most farmers**. This impacts them as they need to plan their livelihood accordingly. Hence it is of utmost importance that income targets are met. In such scenarios, a **fixed budget target driven approach may help**. Given a target, the farmers can have reasonable view of the income they are likely to earn that year. A consistent effort will be put in to earn that income target since they are also the

stakeholders in this income. Here, flexibility that Beyond Budgeting allows may not give the best outcome always. A certain rigidity to achieve target also helps to achieve the target.

Whereas SVS may use the **rolling budget concept** and use of KPIs to measure performance since the situation is dynamically changing. This may help them remain robust to meet competition.

Hence the use of the model should be situational.

- Conceptually correct **brief explanation** is **sufficient** for each step.
- **Alternate points** and **reasoning** are also possible.

Question 6

- (a) RST Herbals (P) Limited, which manufactures and sells a highly successful line of herbal home care and herbal personal care products, has decided to diversify in order to stabilize sales throughout the year.

The company is considering venturing into manufacture of natural health care products. After considerable research, the natural health care products line has been developed. However, the CEO of the company has decided to introduce only one of the new products during the next month. If the product is success, further expansion in future years will be initiated.

The product selected is an immunity booster drink 'IM9' that will be sold in small glass bottles. The product will be sold to wholesalers in boxes of 24 glass bottles for ₹ 240 per box. Because of excess capacity, no additional fixed manufacturing overhead costs will be incurred to produce the product. However, a ₹ 27,00,000 charge for fixed manufacturing overhead will be absorbed by the product under the company's absorption costing system.

Using the estimated sales and production of 1,00,000 boxes of 'IM9', the Costing Department has developed the following cost per box:

Direct material	₹ 108
Direct labour	₹ 60
Manufacturing overhead	₹ 42
Total cost	₹ 210

The costs above include costs for producing both the immunity booster drink and the small bottle that contains it. As an alternative to making the small bottles, RST has approached a supplier to discuss the possibility of purchasing the bottles for 'IM9'. The purchase price of the empty bottles from the supplier would be ₹ 40.5 per box of 24 bottles. If RST accepts the purchase proposal, direct labour and variable manufacturing overhead costs per box of 'IM9' would be reduced by 10% and direct materials costs would be reduced by 25%.

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Required

- (i) Should RST Herbals make or buy the bottles ? Show calculations to support your answer. **(3 Marks)**
- (ii) What would be the maximum purchase price acceptable to RST Herbals? EXPLAIN. **(1 Mark)**
- (iii) Instead of sales of 1,00,000 boxes, revised estimates show a sales volume of 1,20,000 boxes. At this new volume, additional equipment must be acquired to manufacture the bottles at an annual rental of ₹12,00,000. Assuming that the outside supplier will not accept an order for less than 1,00,000 boxes, should RST Herbals make or buy the bottles ? Show computations to support your answer. **(1 Mark)**
- (iv) Refer to the data in (iii) above. Assume that the outside supplier will accept an order of any size for the bottles at ₹ 48 per box. How, if at all, would this change your answer? Show computations. **(1 Mark)**
- (v) What qualitative factors should RST consider in determining whether they should make or buy the bottles ? **(4 Marks)**
- (b) RBC Company uses a two-variance analysis for overhead variances. Practical capacity is defined as 48 setups and 48,000 machine hours to manufacture 9,600 units for the year. Selected data for 2021 is as follows:

Budgeted fixed factory overhead :		
Set-up	₹96,000	
Other	₹3,00,000	₹3,96,000
Total factory overhead incurred		₹7,20,000
Variable factory overhead rate :		
Per set-up		₹900
Per machine hour		₹7.50
Total standard machine hours allowed for the units manufactured		45,000 hours
Machine hours actually worked		52,500 hours
Actual total number of set-ups		42

Required

- (i) COMPUTE the total overhead spending variance, the overhead efficiency variance and the total overhead flexible-budget variance for 2021. **(4 Marks)**
- (ii) Assume that the company uses only machine hours as the activity measure to apply both variable and fixed overhead and that it includes all set-up costs as variable factory overhead. What is the overhead spending variance, efficiency variance and flexible-budget variance for the year ? **(4 Marks)**
- (iii) What are the factors to be considered when investigating variances? **(2 Marks)**

Answer

- (a) (i) RST Herbals is *not operating at capacity* and will not be required to incur additional manufacturing overhead costs (fixed portion) to produce the bottles/product. Therefore, make-or-buy decisions must be based on the relevant cost of each option which includes all incremental cash flows. Refer below calculations, the company would be able to save ₹6.00 per box from manufacturing at desired production level of 1,00,000 boxes or in total ₹6,00,000. Therefore, **RST Herbals should manufacture the bottles.**

	Relevant 'Make' Cost/ box	Relevant 'Buy' Cost/ box
Direct Material	27.00	---
Direct Labour	6.00	---
Manufacturing Overhead (variable*)	1.50	---
Empty Bottles	---	40.50
Total	34.50	40.50

*Manufacturing overhead of 'IM9' is ₹42 per box, this includes absorbed overhead of ₹27(=27,00,000/1,00,000). Therefore, variable manufacturing overhead will be ₹15 per box.

- (ii) The problem asks for the minimum purchase price. The context of the problem implies that the maximum purchase price is what was really required. RST Herbals would not pay more than ₹34.50 each because that is the cost to make the product internally. **Obviously, the company would be willing to pay any amount which is less than ₹34.50.**
- (iii) For revised volume of 1,20,000 boxes, the relevant manufacturing cost per box will be increased by ₹10 per box. In that case the company would be able to save ₹4.00 per box **from buying outside** (₹34.50+₹10.00-₹40.50). Therefore, it is better to purchase from outside rather entirely producing inhouse. **Total benefits on account of buying from outside would be ₹4,80,000.** However, if company decides for partial manufacturing in house, production will give the lowest cost since the company would be able to save the additional equipment cost of ₹12,00,000 but company have to pay ₹6 per box extra on 1,00,000 boxes (i.e., minimum order volume). **Total benefits on account of partial manufacturing (vs. full manufacturing) would be ₹6,00,000.** Refer below working-

In- house Production	1,20,000	---	20,000
Outside Purchase	---	120,000	1,00,000 (minimum)
Relevant Make Cost	41,40,000 (@34.50) 12,00,000 (additional)	---	6,90,000 (@34.50)

Relevant Buy Cost	---	48,60,000 (@40.50)	40,50,000 (@ 40.50)
Total	53,40,000	48,60,000	47,40,000

Therefore, RST Herbals should make 20,000 units and buy 1,00,000 units.

- (iv) If outside supplier agrees to accept an order of any size for the bottles, the company may enhance its production to 1,00,000 boxes (i.e., the level, beyond this it has to incur additional equipment annual rental cost*) from the in-house production level as arrived in point (iii) i.e., 20,000 boxes. Thus, for balance requirement beyond 1,00,000 boxes, company have to buy at higher rate of ₹48 which is ₹7.5 over and above the current supply rate of ₹40.5. Accordingly, it will incur additional cost of ₹1,50,000 (₹7.5×20,000) and simultaneously it will be able to save ₹4,80,000 i.e., ₹6 per unit on additional in-house production of 80,000 boxes. In total, it will save ₹3,30,00 from the optimal cost level as arrived in option (iii). Now the total cost under this scenario would be **₹44,10,000/- which is the lowest cost at 1,20,000 boxes level.**

In- house Production	1,00,000 (maximum)*
Outside Purchase	20,000 (minimum)
Relevant Make Cost	34,50,000 (@34.50)
Relevant Buy Cost	9,60,000 (@ 48.00)
Total	44,10,000

*Assumed for any additional unit over and above 1,00,000 units, additional equipment investment will be required.

Hence, RST Herbals should make 1,00,000 units and buy 20,000 units.

- (v) Currently RST Herbals is manufacturing **herbal home care and herbal personal care products**. It seems that the **existing product line is highly competitive**. Usually, a company with highly competitive product line/ (s) may decide to make its own products as a way to reduce **cost-price squeeze**. However, companies looking for expansion may opt for outsourcing. The reason is that the company can use its money (or cash flows) more profitably to expand its product lines rather than investing in equipment, materials, and additional space for making products. RST Herbals has decided to **diversify*** by venturing into **natural health care** products. Consequently, the CEO has opted to introduce immunity booster drink “IM9” with plans for further expansions. In this scenario, RST Herbals may easily **outsource non-core activities i.e., manufacturing of the bottles to create a scope of further expansion**. In addition, buying of bottles to a certain extent is also justified by the economic factors also.

Overall, the decision of make (in-house) versus buy (outsource) should not be made without careful analysis, a variety of factors and risks are required to be taken into consideration.

*Diversification – new product and new market (Ansoff Matrix)

ALTERNATIVE

Part (i)

₹27,00,000 in fixed overhead cost charged to the new product is a common cost that will be the same whether the bottles are produced internally or purchased from the outside. Hence, it is not relevant. The variable manufacturing overhead per box of "IM9" would be ₹15 as shown below–

Total manufacturing overhead cost per box of "IM9"	₹42
Less:	
Fixed Portion (₹27,00,000/ 1,00,000)	₹27
Variable Overhead Cost per box	₹15

Total Variable Cost of producing one box of "IM9" –

Direct Material	₹108
Direct Labour	₹60
Variable Manufacturing Overhead	₹15
Total Variable Overhead Cost per box	₹183

If the bottles for "IM9" are purchased from the outside supplier, then the variable cost per box of "IM9" would be–

Direct Material (₹108×75%)	₹81.00
Direct Labour (₹60×90%)	₹54.00
Variable Manufacturing Overhead (₹15×90%)	₹13.50
Cost of bottles purchased	₹40.50
Total Variable Overhead Cost per box	₹189.00

Therefore, the company should reject the outside supplier's offer. **A savings of ₹6 (₹189-₹183) per box of "IM9"** will be realized by producing the bottles internally.

Part (ii)

The maximum purchase price would be ₹34.50 per box. The company would not be willing to pay more than this amount because of the ₹34.50 represents the cost of producing one box of the bottle internally, as shown in Part (i). To make purchasing the bottles attractive, however, the purchase price should be **less than ₹34.50 per box**.

Working:**Cost of producing bottles internally**

= total variable cost of producing – cost if bottles are not manufactured
= ₹183 - ₹81 - ₹54 - ₹13.5 = ₹34.50

Part (v) [LIST]

There are many **non-quantifiable factors** which RST should consider in addition to the economic factors calculated above. Among such factors are:

1. The quality of the purchased bottles as compared to RST- produced bottles.
2. The reliability of delivery to meet production Buying the bottles schedules.
3. The financial stability of the supplier.
4. Development of an alternate source of supply.
5. Alternate uses of bottles manufacturing capacity.
6. The long -run character and size of the market.

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- (b) (i) Standard hrs. per unit = 48,000 hrs. / 9,600 units
 = 5 hrs. per unit
- No. of units manufactured during the period = Standard hrs./ Standard hrs. per unit
 = 45,000 hrs./ 5 hrs.
 = **9,000 units**
- Budgeted no. of units/ setup = 9,600 units/ 48 set-ups
 = 200 units/ set-up
- Standard no. of setups for the units manufactured = 9,000/ 200
 = ₹ 45

	Actual (C)	Calculation	Flexible budget based on Inputs (i.e., based on actual activity units) (B)	Calculation	Flexible budget based on Output (i.e., based on standard allowed activity units) (A)
Variable Overheads					
Setup		42 × ₹900	₹37,800	45 × ₹900	₹40,500
Hrs.		52,500 × ₹7.5	₹3,93,750	45,000 × ₹7.5	₹3,37,500
Fixed Overheads			₹3,96,000		₹3,96,000
Total Overheads	₹7,20,000		₹8,27,550		₹7,74,000
		(B)-(C)		(A)-(B)	
		Spending Variance = ₹1,07,550 (F)		Efficiency Variance = ₹53,550 (A)	
		(A)-(C)			
		Flexible-budget Variance = ₹54,000 (F)			

(ii) Standard variable overhead application rate

Setup cost	= ₹ 96,000 + (₹900 × 48)
	= ₹ 1,39,200
Applied based on machine hours	= 48,000 × ₹7.50
	= ₹ 3,60,000
Total variable factory overhead at <i>practical capacity</i>	= ₹ 4,99,200
Practical capacity	= 48,000 hrs.
Standard variable factory overhead rate	= ₹10.40

	Actual (C)	Calculation	Flexible budget based on <i>Inputs</i> (i.e., based on <i>actual activity units</i>) (B)	Calculation	Flexible budget based on <i>Output</i> (i.e., based on <i>standard allowed activity units</i>) (A)
Variable Overheads		52,500 x ₹10.40	₹5,46,000	45,000 x ₹10.40	₹4,68,000
Fixed Overheads			₹3,00,000		₹3,00,000
Total Overheads	₹7,20,000		₹8,46,000		₹7,68,000
			(B)-(C)		(A)-(B)
		Spending Variance = ₹1,26,000 (F)			Efficiency Variance = ₹78,000 (A)
			(A)-(C)		
			Flexible-budget Variance = ₹48,000 (F)		

(iii) Factors to be Considered When Investigating Variance

Certain set of factors should be considered before undertaking the variance investigation of the actual performance against the estimated set.

Size: A standard is seen as an average of the estimates and therefore small variations seen from the standard should be ignored and not investigated further. In addition, organizations can establish limits and the variances seen beyond those limits should be undertaken for further investigation.

Type of Variance: Adverse variance is given more importance by the organization over favourable variances seen with regards to the estimates.

Cost: The costs associated with the undertaking of the investigation should be lower than the benefits associated with the investigation of variances for the organization to undertake the said investigation.

Pattern in variance: The variances need to be monitored over a period of time and if the variance of a particular cost is seen to be worsening over time then in that case the investigation in relation to the variance needs to be undertaken.

Budgetary process: In case the budgetary process is uncontrollable and unrealistic then in that case the investigation should be re-evaluating the budgetary process rather than undertaking investigation of the variances.