PAPER – 5: STRATEGIC COST MANAGEMENT AND PERFORMANCE EVALUATION

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

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

Working notes should form part of the answers.

Wherever necessary, candidates may make appropriate assumptions and clearly state them.

Question 1

RS Tools Ltd. is a leading force in manufacture and supply of modern agriculture equipment like Power Tillers, Kisan Krafts, Agriculture Reaper and other Lawn Care equipment. The company grew substantially over the course of decades and presently ranked 20th by size in the global arena and has become a household name in every agriculture family in the country.

As commonly happens when an enterprise goes in leaps and bounds in a way like this, RS Tools Ltd. is experiencing an increasing degree of supply chain complexities and for many years it did nothing to address the difficulties of its decentralized and fragmented network. The top management decided recently to enter into small irrigation components segment with the brand name 'SIRI', the demand for which is extremely seasonal, and majority of sales are forecasted to occur between April to July every year. The company currently is replenishing dealer's inventory every month, using direct shipment from its central warehouse which is not order driven and is not in sync with the industry average. This kind of dispatching the orders is proving too costly and too slow and not in consonance with the demand pattern. The top management of RS Tools Ltd has started getting doubts about the company's ability to supply its existing 300 plus dealer network, to meet the consistent market demand of its regular agriculture equipment along with the seasonal demand of its new branded products 'SIRI'. They recognized that this state of affairs cannot be allowed to continue in the long run and decided to adopt a long-term program of strategic optimization.

The company has launched an initiative to achieve a targeted 15% reduction in supply chain cost within next 3 years and constituted an expert group to oversee this task. Mr. Karthik, the management consultant, is unanimously appointed at the board meeting to head the expert group formed to revamp the supply chain management. The management is squarely convinced with three of his bold and frank remarks to the board that:

(a) *"Most Companies begin with the best intentions to achieve successful and sustainable supply chain cost management, but somehow lose momentum, only to see costs increase in short term due to the implementation costs of SCM".*

(b) *"If you tell me your company hasn't been able to sustain any progress in supply chain cost reduction in short run, I wouldn't be surprised at all".*

(c) *"No producer has the ability to give the customers what they want, when they want and at the price they want unless the value chains also have been encouraged".*

When the expert team headed by Mr. Karthik began investigation, they found three areas of feasible leverage to reduce supply chain costs which are listed below –

(i) Consolidating shipments and use of third-party logistic providers as the existing decentralized environment of sourcing and inbound logistics are being managed by teams in different places with insufficient transparency in supply chain.

(ii) Leveraging on maintaining optimum inventory by bringing the order cycle time down to an industry average of 15 days.

(iii) The existing supply chain has evolved rather than grown by design and hence had become unnecessarily complex and the enterprise as a whole is not taking the advantage of synergies and economies of scale.

Mr. Karthik undertook a supply chain network redesigning program –

- *to reorganize the supply chain,*
- *to reduce cost to serve and*
- *to lay the groundwork for future capability in the supply chain.*

He is determined to revitalize the Supplier Relationship management as well as the numbers of suppliers are very large in number and the company is burdened with quality, delivery and payment issues from the suppliers. He has decided to suggest the use of E-procurement process as a part of upstream supply chain as a remedy to this hiccup.

You being an associate consultant in his office have been asked by Mr. Karthik, to help him by preparing a briefing to be given to the board based on the above facts with particular reference to the following:

(a) LIST the critical issues being faced by RS Tools Ltd under the present setup based on the facts of the above case. ***(3 Marks)***

(b) In the light of the initial remarks made by Mr. Karthik at the time of he being designated to head the expert group, EXPLAIN the supply chain management and ANALYZE the validity of the views expressed by Mr. Karthik. ***(4 Marks)***

(c) LIST the major benefits that RS Tools Ltd would reap by energizing the Supply Chain Management. ***(3 Marks)***

(d) EVALUATE how Supplier Relationship Management is going to help RS Tools Ltd.

(4 Marks)

(e) DESCRIBE E procurement and its process in the context of upstream supply chain management and DISCUSS its constituents. ***(3 Marks)***

(f) ADVISE whether the outsourcing as suggested by Mr. Karthik would help RS Tools Ltd in settling logistic constraints. ***(3 Marks)***

Answer

(a) Due to **decentralised and fragmented network** the supply chain in present set-up is complex and caused **following critical issues** being faced by RS Tools Ltd.

1. **Costly and slow supply –** Because currently RS Tools Limited are supplying from central warehouse.
2. **Supply not in consonance with the demand pattern –** Currently RS Tools Limited replenishing dealer's inventory every month, which is not *order driven* and is not in *sync with the industry average*.
3. **Wide dealership and required infrastructure –** Since the dealers are large in quantum and fragmented too hence there is doubt about ability to supply its 300 plus dealers.
4. Regular agriculture product has **consistent market demand**, while new branded products SIRI has **seasonal demand**.

(b) Since **supply chain** encompasses all activities and information flows necessary for the transformation of goods from the origin of the raw material to when the product is finally consumed or discarded, hence **supply chain management is the continued management of the flow of goods and services and includes all processes that transform raw materials into final products**; It involves the active streamlining of a business's supply-side activities from sustainable perspective to maximize customer value and gain a competitive advantage in the marketplace.

The views expressed by Mr. Karthik are valid largely. Sustainable **supply chain cost management is continuous effort** rather one-time initiative, wherein **commitment is required from top to bottom** of organisation to reap the desired results.

Complex the structure is, more and more time it would require, hence in short run cost may be more than benefits (in term of low-cost reduction). Since the Supply Chain Management is purposes to maximise the customer value**,** hence yield better results when **supported by value chain analysis**.

ALTERNATIVE 1(b)

A complete chain serving the customers or consumers whether linked or interdependent is the composition of supply chain. It comprises vendors that supply raw material, producers who convert the material into products, warehouses that store, distribution centres that deliver to the retailers and retailers who sell the products to the ultimate user.

All activities associated with the flow and transformation of goods from raw material to end user is called supply chain. An important objective of SCM is to correlate the production and distribution of goods and services with the demand of the product.

Analysing the Views of Mr. Karthik

(i) Implementation of supply chain management should be *viewed as an investment* rather than cost that should be minimized. Implementation of SCM may demand relatively high investments in installing quality software etc. and may also prompt certain hidden costs. Some expenses cannot be forecasted beforehand, and this may frustrate the top management if they are interested to reap in readymade results. So, this comment is valid.

(ii) The term supply chain can be referred to as the entire network of organisation working together from design, produce, deliver, and service the products. In other words, all activities associated with the flow and transformation of goods from raw material to end user is called supply chain. **It is a multifaceted exercise and *cannot present any instant and onetime results*. So, the comment is valid.**

(iii) The following activities which are termed as primary activities under value chain model forms part of SCM.

- Inbound Logistics covering procurement and related activities.
- Operations covering conversion of raw material into finished products.
- Outbound Logistics covering movement of products from plants to end users.
- Marketing and Sales
- Service

Supply Chain Management looks each of the above activities as integrated and interrelated to each other. So, the comment that unless value chains are encouraged customers' demands cannot be met is also valid.

(c) Supply Chain Management leads to strategic optimisation through enormous benefits such as inventory reduction, personnel reduction, productivity improvement; order management improvement, financial cycle improvement etc. Further it results in information visibility, new/ improved processes, customer responsiveness, standardization - flexibility & globalization of business performance.

Energizing the Supply Chain Management expected to reap following benefits to RS Tools Limited–

1. **Optimum inventory in consonance with the demand pattern** – by cutting order cycle time from 1 month to an industry average of 15 days will bring down the inventory to *optimum level* and improve the working capital cycle.
2. **Expertise of third party logistic (TPL)** – No, doubt outsourcing cause cost, but it will bring the expertise too apart from saving of time resource which management can spend upon the *core* and *value generating activities*.
3. **Ease and transparency** – Current supply chain is *evolved* rather designed, hence energizing the supply chain management can remove the existing complexities and bring the ease to RS Tools Ltd. Further transparency regarding process and customer requirement will also be there due to generation, transmission and management information as part of supply chain management.

4. **Reduced supply chain cost** – either due to reduction in inventory to optimal level or streamline the activates over supply chain from procurement (such as e-procurement) to delivery to customer (such as using TPL) will result in supply chain cost management. It is important here to note that RS Tools Limited aim for *15% cost reduction target* in three years' time.
5. **Generating capabilities and becoming future ready (sustainable supply chain)**– Currently RS Tools Ltd. is doubting their capabilities to continue the supply of regular products to existing 300+ dealers. It is *extending the product range* as SIRI is added and in future expected to expand the dealers' network too, hence energizing the Supply Chain Management can help in term of improve and enhanced capabilities.

(d) A supply chain when the flow relates to supplier it is termed as upstream flow, hence management of transaction with the supplier will be termed as **upstream supply chain management**. Upstream supply chain management rely upon **supplier relationship management** and **use of information technology.**

Supplier relationship management provides the structure for how relationships with suppliers are developed and maintained. This help the organisation to gain the advantage out of supplier capabilities to innovation, ensure quality, be reliable – in term of delivery and frequency, eliminate the variation in costs/price reductions and agility to reduce risk factors.

Revitalization of Supplier relationship management expected to help RS Tools Limited in following manners-

1. **Extended value chain (& consolidated supply chain) to ensure quality and innovation–** Concern for quality is mentioned in case. Purpose of supply chain management is to improve the customer experience by offering *more value*. Value in product depends upon input used, hence supplier can play vital role in same. For this relation suppliers shall be cordial, and Supplier relationship management is capable to ensure this.
2. **Reduce in number of suppliers for better management and favourable credit & trade terms considering the payment issue–** since it is mentioned in case that RS Tools Limited is burdened with the payment issue, hence may buy its supplies from limited suppliers. Because it is obvious if large volume purchase from limited suppliers or selected suppliers, they will offer relaxed credit terms and competitive prices, **against this** if requirement is to avoid failure in deliver, then prefer multiple suppliers. Switching to new supplier may reduce the cost in some cases.
3. **Enhanced reliability in delivery –** Better relationship with supplier and sharing of information lead to enhanced reliability in delivery in term of quantity, frequency, place and time. **However**, an audit needs to be made of supplier performance and the opportunity, or otherwise, for RS to concentrate on suppliers able to deliver on time. Clearly there are *costs associated* with this.

(e) A supply chain when the flow relates to supplier it is termed as upstream flow, hence management of transaction with the supplier will be termed as upstream supply chain management. The main activities of upstream supply chain are *procurement* and *logistics*. Upstream supply chain management rely upon supplier relationship management and use of information technology.

E-Procurement is the electronic methods *beginning from identification of the organization's requirements and end on payment*. It can be seen as technology solution designed to centralise and automate interactions between an organisation and its' suppliers to improve the speed and efficiency of procurement practices.

E-Sourcing, E-Purchasing and E-Payment are constituent of E-Procurement.

E-Sourcing covers electronic methods for finding new suppliers and establishing contracts. E-Sourcing is inviting the tenders and quotations online from any part of world, that too in cost and time effective manner; hence E-Sourcing is considered as the *best possible way to find out the best supplier*.

E-Purchasing covers *product selection* and *ordering online*, hence streamlines procurement and reduces overheads. Decentralised and need based orders are placed rather by central ordering department.

E-Payment includes tools such as *electronic invoicing* and *electronic funds transfers*. This brings benefit of real-time settlement, error proof system and automatic and real-time record maintenance through ERP.

(f) Outsourcing is business practice used by companies to reduce costs (extra capital expenditure in technology) or improve efficiency by shifting task, operations jobs or processes to another party for span of time. Outsourcing suggested by Mr. Karthik would help RS limited in settling logistic constraints to larger extent, because-

1. Currently it is feeling doubtful whether has **ability to serve the existing network of 300+ distributors**, while it is replenishing dealer's inventory every month. When it starts replenishing the inventory after every 15 days then existing logistic system may fail hence outsourcing may be a way out to settle the existing logistic constraint.
2. Newly acquired **product SIRI has seasonal demand** only for 4 calendar months in a year, hence generating logistic *capabilities for 4 months which remain idle* for remaining months of year is not seem financially viable solution hence outsourcing in case of SIRI is seeming best way to settle the existing logistic constraint.

Note– Third party logistics provider's *expertise* may enhance customer experience and management may get more time to focus on strategic aspects. Hence RS Tools Ltd. need to evaluate its value chain and try to categories logistic either as value generating or non-value generating activity. If logistic is largely non-value generating activity from the customers' perspective of RS Tools limited, it shall be outsourced the logistics and focus on the core. Overall, depending upon the application of various strategic cost management techniques, decision on outsource shall be taken.

☞

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

Question 2

(a) ABC Ltd an Investment company undertakes share market research for its clients. To design a tailor made investment strategy for clients the designated team of staff takes 4 months. The team comprises involvement of 3 divisions.

Types of staff used	***Proportion of variable costs incurred for respective months***				***Total Variable Cost***
	April	***May***	***June***	***July***	
Data Collection	*20%*	*30%*		*50%*	*100%*
Research		*40%*	*40%*	*20%*	*100%*
Advisory	*30%*	*10%*	*40%*	*20%*	*100%*

The variable costs of ABC Ltd are distributed among the 3 categories of staff in the following ratios:

Department	***Share in total variable costs incurred***
Data Collection	*30%*
Research	*50%*
Advisory	*20%*
Total Variable Cost	*100%*

The contribution from each department would be at the following percentages:

Department	***Required Contribution as a percentage on variable costs***
Data Collection	*100%*
Research	*80%*
Advisory	*150%*

For calculation of monthly revenue generated the value of work executed is divided on the following lines:

April	*30%*	***June***	*30%*
May	*20%*	***July***	*20%*

The work executed by ABC Ltd in the month of April is ₹3,00,000, May ₹2,00,000, June ₹3,00,000 and in July ₹2,00,000.

CALCULATE the additional order to be received if the targeted contribution that the company wants to earn is ₹1,50,000 for the period April to July.

(You may assume that no fixed costs are relevant in arriving any calculations and the profit percentage of July is to be considered for calculating the additional order required in July.)

(12 Marks)

(b) *The newly appointed Finance Director Mr. Praveen, in the month of September wants to make the billing pattern simple and proposed to change the price quoting methodology of the organization. The details of his proposal are listed below: -*

The target cost for each research work is fixed in consultation with the client and the ABC Ltd. receives a bonus for completing the work below target cost.

For a particular research conducted for Mr. Mohan, ABC Ltd has agreed upon a target cost of ₹20,00,000 and a target fee of ₹1,40,000. If the ABC Ltd completes the research at a lower cost than ₹20,00,000 then it will receive an additional profit up to a maximum profit of ₹1,80,000. If ABC Ltd completes the work for more than the target cost, then it will receive less profit but at least ₹40,000. If the work is performed below the target cost, the client keeps 80% of the savings and leaves 20% of the surplus to ABC Ltd as an extra profit up to a maximum of ₹1,80,000. If the cost of research work exceeds the target cost, the client would bear 80% of the excess costs over and above the target cost and ABC Ltd would bear 20%, which is subtracted from the target profit as long as the profit is not less than ₹40,000. If the actual work performed amounted to ₹19,00,000.

CALCULATE the following:

(i) Cost saving for the project,

(ii) ABC Ltd.'s share in surplus,

(iii) ABC Ltd.'s total profit,

(iv) Total cost to Mr. Mohan for market research work. ***(1 x 4 = 4 Marks)***

Now assume the ABC Ltd. spent ₹24,00,000 for performing the work to ascertain.

(v) Cost overrun

(vi) Mohan's burden

(vii) ABC's burden

(viii) Total Cost to Mr. Mohan for market research work. ***(1 x 4 = 4 Marks)***

Answer

(a) Statement Showing Allocation of Income

Particulars	April	May	June	July	Total	Remarks
Work Executed	**60.00**	**40.00**	**60.00**	**40.00**	**200.00**	(Given- 30%; 20%; 30%; 20%)
Data Collection						
Sales	18.00	12.00	18.00	12.00	60.00	[in Dept. ratio; based on col.(c)]
Variable Cost	**6.00**	**9.00**	**-**	**15.00**	**30.00**	(Given- 20%; 30%; 0%; 50%)
Contribution	12.00	3.00	18.00	- 3.00	30.00	Balance
Research						
Sales	27.00	18.00	27.00	18.00	90.00	[in Dept. ratio; based on col.(c)]
Variable Cost	**-**	**20.00**	**20.00**	**10.00**	**50.00**	(Given- 0%; 40%; 40%; 20%)
Contribution	27.00	-2.00	7.00	8.00	40.00	
Advisory						
Sales	15.00	10.00	15.00	10.00	50.00	[in Dept. ratio; based on col.(c)]
Variable Cost	**6.00**	**2.00**	**8.00**	**4.00**	**20.00**	(Given- 30%; 10%; 40%; 20%)
Contribution	9.00	8.00	7.00	6.00	30.00	
Total Cont.	48.00	9.00	32.00	11.00	100.00	(All Departments)
Cont. % of Sales	80%	23%	53%	28%	50%	(Total Cont.as a % of monthly Sales)
Actual Sales	3,00,000	2,00,000	3,00,000	2,00,000	10,00,000	(Given- Work Executed)
Actual Contribution	**2,40,000**	**45,000**	**1,60,000**	**55,000**	**5,00,000**	(Monthly Cont. on Work Executed)
OR						
Cont.% on Total Sales	**24.00%**	**4.50%**	**16.00%**	**5.50%**	**50.00%**	(Cont.% based on total 4 months Sales)
Actual Sales	3,00,000	2,00,000	3,00,000	2,00,000	10,00,000	(Given- Work Executed)
Actual Contribution	**2,40,000**	**45,000**	**1,60,000**	**55,000**	**5,00,000**	(Monthly Cont. on Work Executed)

Workings

Let Variable Cost of Work be ₹ 100.

Departments	Share in Total Variable Cost incurred (a)	Required Contribution as a % on Variable Costs (b)	Sales
Data Collection	30	30	60
Research	50	40	90
Advisory	20	30	50
Total	100	100	**200**

Question requires **to calculate the additional order to be received if the targeted contribution that the company wants to earn is ₹ 1,50,000 for the period April to July**. ABC Ltd. is earning a total contribution of ₹ 5,00,000 for the aforesaid period on total Sales of ₹ 10,00,000 (i.e., work executed), Contribution is already higher than the required, so there is no need of further calculation. However, calculation can also be presented in alternative ways.

(b) <u>If the actual work performed amounted to ₹ 19,00,000</u>

(i) Cost Saving for the project = ₹ 20,00,000 - ₹ 19,00,000 = ₹ 1,00,000

(ii) ABC Ltd.'s Share in Surplus = ₹ 1,00,000 × 20% = ₹ 20,000

(iii) ABC Ltd.'s Total Profit = ₹ 20,000 + ₹ 1,40,000 = ₹ 1,60,000

(iv) Total Cost to Mr. Mohan for market research work = ₹ 19,00,000 + ₹ 1,60,000 = ₹ 20,60,000

<u>If the actual work performed amounted to ₹ 24,00,000</u>

(v) Cost overrun = ₹ 24,00,000 - ₹ 20,00,000 = ₹ 4,00,000

(vi) Mohan's burden = ₹ 4,00,000 × 80% = ₹ 3,20,000

(vii) ABC's burden = ₹ 4,00,000 × ₹ 20% = ₹ 80,000

(viii) Total Cost to Mr. Mohan for market research work = ₹ 24,00,000 + ₹ 1,40,000 - ₹ 80,000 = ₹ 24,60,000

Question 3

Alpha and Beta are two divisions of the Active Multinational Ltd. (AML). The Division Alpha manufactures auto components which it sells to other divisions and external customers.

The Division Beta has designed a new product, Product BZ, and has asked Division Alpha to supply the auto component, Component AX, that is needed in the new product. Each unit of

Product BZ will require one Component AX. This Component will not be sold by Division Alpha to external customers. Division Alpha has quoted a transfer price to Division Beta of ₹40 for each unit of Component AX.

It is the policy of the company to reward managers based on their individual division's return on capital employed.

Division Alpha produces the Component AX in batches of 1,000 units. The maximum capacity is 8,000 Components per month. Variable costs amount to ₹ 12 per component. Fixed costs per month are ₹60,000.00 which is specifically incurred to produce Component AX.

Product BZ will be produced in batches of 1,000 units in Division Beta. The maximum customer demand is 8,000 units of Product BZ. Variable costs will be ₹8 per unit plus the cost of component AX. Fixed costs of ₹90,000.00 are to be incurred specifically to produce Product BZ.

The head of Division Beta has given the following forecast:

Demand	Selling price per unit (₹)
2,000 units	120
4,000 units	100
5,000 units	90
6,000 units	82
7,000 units	70
8,000 units	65

Required

(a) *CALCULATE, based on a transfer price of ₹40 per Component AX, the monthly profit that would be earned as a result of selling Product BZ by (Here the situation is governed by the actions of the manager of Division Beta) :*

  (i) *Division Beta*

  (ii) *Division Alpha*

  (iii) *Company as a whole* ***(5 Marks)***

(b) *FIND out the profit maximizing output from the sale of Product BZ for the Active Multinational Ltd.* ***(6 Marks)***

(c) *CALCULATE, using the marginal cost of Component AX as the transfer price, the monthly profit that would be earned as a result of selling Product BZ by*

  (i) *Division Alpha*

  (ii) *Division Beta*

  (iii) *Company as a whole* ***(3 Marks)***

(d) The Operation Head of the company requires internal transfer between the divisions at marginal cost from the overall company's perspectives. If marginal cost is used as the transfer price the manager of the Division Alpha will not be motivated as there will be no incentive to the division to transfer components internally.

What transfer pricing policy would you SUGGEST to help the company to overcome the conflict between optimum decision making and performance evaluation? ***(6 Marks)***

Answer

(a) The situation is governed by the actions of the manager of Division Beta. Based on a transfer price of ₹ 40 per component, the variable cost per unit of Product BZ will be ₹ 48.

Demand	Selling Price p.u. (₹)	Variable Cost p.u. (₹)	Contribution p.u. (₹)	Total Contribution (₹ '000)
2,000	120	48	72	144
4,000	100	48	52	208
5,000	**90**	**48**	**42**	**210**
6,000	82	48	34	204
7,000	70	48	22	154
8,000	65	48	17	136

Division Beta will produce 5,000 units of Product BZ and will therefore order 5,000 of component AX from Division Alpha.

Particulars	Alpha (₹ '000)	Beta (₹ '000)	AML (₹ '000)
Revenue	200	450	450
Less: Variable Costs	60	240	100
Less: Fixed Costs	60	90	150
Profit	**80**	**120**	**200**

(b) The situation for the group should be judged using the total marginal costs of the divisions. This will give a variable cost per Product BZ of ₹ 20.

Demand	Selling Price p.u. (₹)	Variable Cost p.u. (₹)	Contribution p.u. (₹)	Total Contribution (₹ '000)
2,000	120	20	100	200
4,000	100	20	80	320
5,000	90	20	70	350
6,000	**82**	**20**	**62**	**372**
7,000	70	20	50	350
8,000	65	20	45	360

The profit maximising output is 6,000 units of Product BZ.

(c) Statement Showing Monthly Profit (transfer price = marginal cost of AX)

Particulars	Alpha (₹ '000)	Beta (₹ '000)	AML (₹ '000)
Revenue	72	492	492
Less: Variable Costs	72	120	120
Less: Fixed Costs	60	90	150
Profit	**-60**	**282**	**222**

The profit maximising output is 6,000 units of Product BZ using marginal cost of component AX as the transfer price. This will earn a total monthly profit for the AML Group ₹ 2,22,000.

(d) Transfer at marginal cost is *unsuitable for performance evaluation* since they do not provide an incentive for the supplying division to transfer goods and services internally. This is because they do not contain a profit margin for the supplying division. Top Management's intervention may be necessary to instruct the supplying division to meet the receiving division's demand at the marginal cost of the transfers. Thus, divisional autonomy will be undermined. Transferring at cost plus a mark-up creates the *opposite conflict*. Here, the transfer price meets the performance evaluation requirement but will not induce managers to make *optimal decisions*. **To resolve the above conflicts the following transfer pricing methods have been suggested:**

Dual Rate Transfer Pricing System

The supplying division records transfer price by including a *normal profit margin* thereby showing reasonable revenue. The purchasing division records *transfer price at marginal cost* thereby recording purchases at minimum cost**.** This allows for better evaluation of each division's performance. It also improves co-operation between divisions, promoting *goal congruence* and reduction of *sub-optimization* of resources.

Two Part Transfer Pricing System

This pricing system is again aimed at resolving problems related to distortions caused by the full cost-based transfer price. Here,

Transfer price = marginal cost of production + a lump-sum charge (two part to pricing).

While marginal cost ensures recovery of additional cost of production related to the goods transferred, lump-sum charge enables the recovery of some portion of the fixed cost of the supplying division. Therefore, while the supplying division can show better profitability, the purchasing division can purchase the goods at lower rate compared to the market price.

ALTERNATIVE 3(d)

Conflict between optimum decision making and performance evaluation could be overcome by the use of a "Dual Rate Transfer Pricing' system or a 'Two Part Pricing System'.

Dual Rate Transfer Pricing System

With the Dual Rate Transfer Pricing System, the receiving division is charged with *marginal cost* of the intermediate product and supplying division is credited with *full cost per unit plus a profit margin*.

Accordingly, Division Alpha should be allowed to record the transactions at full cost per unit plus a profit margin. On the other hand, Division Beta may be charged only marginal cost. Any inter divisional profits can be eliminated by accounting adjustment.

Impact

Division Alpha will *earn a profit* on inter divisional transfers.

Division Beta can choose the *optimum output level* at which the marginal cost is equal to the marginal revenue of product BZ.

Two Part Transfer Pricing System

The Two-Part Transfer Pricing system involves transfers being made at the *marginal cost per unit* of the output of the supplying division plus *a lump-sum fees* charged by the Supplying Division to the Receiving Division for the use of the capacity allocated to the intermediate product.

Accordingly, Division Alpha can transfer its components AX to Division Beta at marginal cost per unit and a lump-sum fixed fee.

Impact

Two Part Transfer Pricing system will inspire the Division Beta to purchase the component AX at *lower rate*. This transfer pricing system also enables the Division Alpha to obtain a *Profit* on inter-division transfer.

Question 4

(a) Sri Manufacturers Ltd. manufactures a single product. Standard cost per unit is as follows:

Particulars		***₹***
Materials	*12 kgs x ₹5 per kg*	*60*
Labour	*10 hrs x ₹7 per hour*	*70*
Variable Overheads	*10 hrs x ₹3 per hour*	*30*
Fixed Overheads	*10 hrs x ₹3 per hour*	*30*
Profit		*60*
Selling Price		*250*

Overheads are allocated on the basis of direct labour hours. In the month of March 2020 there was no difference between the budgeted and actual selling price and there was no opening and closing stock during the period.

The other details for the month of March 2020 are as under:

	Budgeted	Actual
Product and sales	2,500 units	2,000 units
Direct Materials	30,000 kgs @ 5 per kg	30,000 kgs @ 5 per kg
Direct Labour	25,000 hrs @ ₹7 per hour	22,500 hrs @ ₹7 per hour
Variable Overheads	₹75,000	₹67,500
Fixed Overheads	₹75,000	₹75,000

Required

RECONCILE the budgeted and actual profit with the help of variances according to each of the following methods:

(i) The conventional method ***(3 Marks)***

(ii) The relevant cost method assuming that

(a) Materials are scarce and are restricted to supply of 30,000 kgs for the period. ***(3 Marks)***

(b) Labour hours are limited and available hours are only 25,000 hours for the period. ***(4 Marks)***

(b) The Business Digest, a fortnight business magazine, in its recent release has published an article titled "Why you can safely ignore Six Sigma". This was highly critical of Six Sigma. The pointed criticism levelled under five sequentially numbered paras which are listed herein below:

(i) The results often don't have any noticeable impact on company financial statements. Thus, Six Sigma success doesn't assure you the higher stock values. This is true for 90 percent of companies that implement Six Sigma.

(ii) Only early adopters can benefit from the implementation of Six Sigma.

(iii) Six Sigma focuses on defects which are subjective to determine for service business.

(iv) Six Sigma can't assure that your product will have market.

(v) Substantial infrastructure investment is required.

How would you RESPOND to these statements? ***(5 Marks)***

(c) Bharat Heavy Machinery Ltd produces engines for the cars. Variable cost per engine is ₹4,200. Market research has indicated that at a selling price of ₹7,400, no order will be received, but the demand for the engines will be increased by two units for every ₹400 reduction in the unit selling price below 7,400.

You are required to DETERMINE the unit selling price per engine that will maximize the profit of the company.

OR

DISCUSS the connection between Total Quality Management and Total Productive Maintenance. ***(5 Marks)***

Answer

(a) Computation of Variances

Material Usage Variance

= Standard Price × (Standard Quantity – Actual Quantity)

= ₹ 5.00 × (24,000* Kgs. – 30,000 Kgs.)

= ₹ 30,000 (A)

$$*\left(2{,}000\ \text{units} \times \frac{30{,}000\ \text{Kgs.}}{2{,}500\ \text{units}}\right)$$

Labour Efficiency Variance

= Standard Rate × (Standard Hours – Actual Hours)

= ₹ 7.00 × (20,000* hrs. – 22,500 hrs.)

= ₹ 17,500 (A)

$$*\left(2{,}000\ \text{units} \times \frac{25{,}000\ \text{hrs.}}{2{,}500\ \text{units}}\right)$$

Variable Overhead Efficiency Variance

= Standard Variable Overheads for Production – Budgeted Variable Overheads for Actual hours

= (20,000 hrs. × ₹ 3.00) – (₹ 3.00 × 22,500 hrs.)

= ₹ 7,500 (A)

Fixed Overhead Volume Variance

= Absorbed Fixed Overheads – Budgeted Fixed Overheads

= (20,000 hrs. × ₹ 3.00) – (25,000 hrs. × ₹ 3.00)

= ₹ 15,000 (A)

Sales Margin Volume Variance

= Standard Margin – Budgeted Margin

= (2,000 units × ₹ 60.00) – (2,500 units × ₹ 60.00)

= ₹ 30,000 (A)

Sales Contribution Volume Variance

= Standard Contribution – Budgeted Contribution

= (2,000 units × ₹ 90.00) – (2,500 units × ₹ 90.00)

= ₹ 45,000 (A)

Statement Showing "Reconciliation between Budgeted Profit & Actual Profit"

Particulars	Conventional Method (₹)	Relevant Cost Method (₹)	
		Scarce Material	Scarce Labour
Budgeted Profit (2,500 units × ₹ 60)	1,50,000	1,50,000	1,50,000
Sales Volume Variance	30,000 (A)	NIL*	22,500$ (A)
Material Usage Variance	30,000 (A)	75,000 (A)	30,000 (A)
Labour Efficiency Variance	17,500 (A)	17,500 (A)	40,000 (A)
Variable Overhead Efficiency Variance	7,500 (A)	7,500 (A)	7,500 (A)
Fixed Overhead Volume Variance	15,000 (A)	N.A.#	N.A.#
Actual Profit	**50,000**	**50,000**	**50,000**

Notes

Scarce Material

Based on conventional method, direct material usage variance is ₹ 30,000 (A) i.e., 6,000 Kg. × ₹ 5. In this situation material is scarce, and, therefore, material cost variance based on relevant cost method should also include contribution lost per unit of material. Excess usage of 6,000 Kg. leads to lost contribution of ₹ 45,000 i.e., 6,000 Kgs. × ₹ 7.5. **Total material usage variance based on relevant cost method, when material is scarce will be: ₹ 30,000 (A) + ₹ 45,000 (A) = ₹ 75,000 (A).** Since labour is not scarce, labour variances are identical to conventional method.

Excess usage of 6,000 Kgs. leads to loss of contribution from 500 units i.e., ₹ 45,000 (500 units × ₹ 90). It is not the function of the sales manager to use material efficiently. Hence, loss of contribution from 500 units should be excluded while computing sales contribution volume variance.

(*)→ Therefore, sales contribution volume variance, when materials are scarce will be NIL i.e., ₹ 45,000 (A) - ₹ 45,000 (A).

Scarce Labour

Material is no longer scarce, and, therefore, the direct material variances are same as in conventional method. In conventional method, excess labour hours used are: 20,000 hrs. – 22,500 hrs. = 2,500 hrs. Contribution lost per hour = ₹ 9. Therefore, total contribution lost, when labour is scarce will be: 2,500 hrs. × ₹ 9 = ₹ 22,500. **Therefore, total labour efficiency variance, when labour hours are scarce will be ₹ 40,000 (A) i.e., ₹ 17,500 (A) + ₹ 22,500 (A).**

Excess usage of 2,500 hrs. leads to loss of contribution from 250 units i.e., ₹ 22,500 (250 units × ₹ 90). It is not the function of the sales manager to use labour hours efficiently. Hence, loss of contribution from 250 units should be excluded while computing sales contribution volume Variance.

($)→ Therefore, sales contribution volume variance, when labour hours are scarce will be ₹ 22,500 (A) i.e., ₹ 45,000 (A) - ₹ 22,500 (A).

Fixed Overhead Volume Variance

(#) → The fixed overhead volume variance does not arise in marginal costing system. In absorption costing system, it represents the value of the under or over absorbed fixed overheads due to change in production volume. When marginal costing is in use there is no overhead volume variance, because marginal costing does not absorb fixed overheads.

(b) **Response to first criticism** – Six Sigma is part of lean system hence require **commitment of top-management**, implementation with high motivation among employees, and continuous efforts with reasonable patience for reasonable duration. In absence of these, despite implementing Six Sigma; many companies do not witness the impact on the financial of company at par to expected level.

In short run it may possible that company successfully implemented Six Sigma not getting directly visible financial advantage, **but in long run it will**.

Moreover, stock value is not sole feature of quality of product manufactured; it is **impacted by other factors too**.

–Hence, disagree with author.

Response to second criticism – No, doubt early adopter has more benefit from implementation of Six Sigma, on the principle of first mover advantage. But more important is not when organisation started, it is **how long and efficiently it practice** the Six Sigma, longer the duration – larger the benefit.

–Hence, not agree with author.

Response to third criticism – Due to inherent nature of service business, subjectivity is high and it is hard to objectively determine the defect. But this problem is not only with Six Sigma. Further each professional (professional with different belts) has its own style of working hence subjectivity also arise in determination and classification among error and mistake. But use of **certain other tools (value shop etc.) in association with Six–Sigma may reduce subjectivity** to avoid pitfalls.

–Hence, not completely agree with author.

Response to fourth criticism – Product comprises two element **features** and **quality** of such feature. No doubt if customer do not like the product due to features it carry or do not carry then Six Sigma will not help, but if there is issue with the quality (be it conformance or reliability) of the feature then Six Sigma can be really game-changer for the organisation; and capable to build the market for product, by attracting the customer (value chain analysis may be great help). Six Sigma or Lean Six Sigma is customer-oriented and intended to deliver value to the customer.

–Hence, completely disagree with author.

Response to fifth criticism – No doubt substantial infrastructure investment is required both of monetary and non-monetary in nature, but Six Sigma is capable to yield the corresponding significant benefit. Why one company able to create value, where another not is *issue with implementation* not with technique hence Six Sigma is **capable to pay-off the substantial investment**.

An extensive cost benefit analysis can be used prior to decision of implementation.

–Statement in itself is true, but not a valid argument.

☞

- Conceptually correct ***brief explanation*** is sufficient for each point.
- Alternative reasoning is also possible.

(c)

P	= a – bQ
P	= 7,400 – (400 / 2) × Q
Revenue (R)	= Q × [7,400 – 200 × Q]
	= 7,400 Q – 200 Q2
Marginal Revenue (MR)	= a – 2bQ
	= 7,400 – 2 × (400 / 2) × Q
	= 7,400 – 400 Q
Marginal Cost (MC)	= 4,200

Profit is Maximum where Marginal Revenue (MR) equals to Marginal Cost (MC)

7,400 – 400 Q	= 4,200
Q	**= 8 units**

By Putting the Value of 'Q' in Price Equation, Value of 'P' is obtained

P	= 7,400 – (400/ 2) × Q
	= 7,400 – 200 × 8 units
	= 5,800

At Selling Price of ₹ 5,800 Profit will be Maximum.

OR

Discussion- The aims of both TQM and TPM are to improve the efficiency of resources (man/ machine) which can only be attained by minimising waste through total employee involvement and providing quality service to customers. TPM is ***maintenance approach*** while TQM is total ***quality control***. Employee empowerment is a tool used in TQM implementation, while TPM uses optimisation. The connection between TQM and TPM are summarized below:

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

Question 5

(a) (i) Based on the following data CALCULATE 'Overall Equipment Effectiveness:

Particulars	***Data***
Shift length	*9 hours*
Short breaks	*3 of 10 minutes each*
Meal break	*45 min*
Equipment down time	*30 min*
No. of parts produced per hour (Standard)	*30 per min*
Total units produced per shift	*12,240*
Rejected units out of the above	*240*

(5 Marks)

(ii) (A) Based on the answer derived from the above can you DEMONSTRATE that the machine is working at world class performance as suggested by 'Nakajima' ideal values for the 'OEE'. ***(2 Marks)***

(B) "OEE is an aggregate measure. Its components will compensate for each other or, on the contrary, will aggravate a failing situation and attract further attention to it". EXPLAIN. ***(3 Marks)***

(b) Mr. Benn, oversees the diverse operations of Bennsys, a large multinational company by using a much decentralized management structure. According to its 2019 annual report, Bennsys had 1,25,000 employees and earned over $100 billion in revenue. Mr. Benn managed this empire from his headquarters in London, that consists of 20 employees and occupies only 10,000 square feet, although the company's vice-chairman, Simon, who works out of London, occupies another 600 square feet. The total payroll, including benefits, of both locations was only just above $2 million in 2019. Mr. Benn was invited as the chief guest in a business summit organized at New Delhi during March, 2020. Asked about how an organization of that magnitude could be managed with such a small resources as to space and manpower. Mr. Benn's own description about his and Mr. Simon's management style is, "we delegate almost to the point of abdication (renouncing everything)." An exaggeration perhaps, but clearly a decentralized style and he and his deputy are the stable believers of FOUR recognized levels of decentralization.

In the context of responsibility accountings DISCUSS the levels of decentralization which Mr. Benn was referring to and do you concede to the view that Mr. Benn is exaggerating the success of his Divisional organization structure. ***(10 Marks)***

Answer

(a) (i) Seiichi Nakajima led the introduction of TPM, OEE and the Six Big Losses in the early 1970s while at the Japanese Institute of Plant Maintenance. OEE is a quantitative metric for measuring productivity of individual equipment in a manufacturing plant. OEE identifies and measures losses of crucial parts in a manufacturing process namely availability rate, performance rate and quality rate.

OEE = Availability × Performance × Quality

OEE Factors are calculated as follows–

1. Availability: NOT / NAT = (435 / 465) × 100 = 93.55 %
2. Performance: IOT / NOT = (408 / 435) × 100 = 93.79%
3. Quality: (IOT – LOT) / IOT = (408 – 8) / 408 × 100 = 98.04%

Or

$$\left\{\frac{\text{12,240 units - 240 units}}{\text{12,240 units}}\right\}\times 100$$

OEE = A × P × Q = 93.55% × 93.79% × 98.04% = **86.02%**

Alternative Presentation-I

Good Counts = 12,240 – 240 = 12,000 units

Planned Production Time= 540 mins. – 75 mins. = 465 mins. (or NAT)

OEE= (Good Counts × Ideal Cycle Time)/ Planned Production Time

{(12,000 / 30 units (per min.)} / 465) x 100 = **86.02%**

Alternative Presentation-II

OEE = (Ideal operating time – loss operating time)/ Net Available Time

{(408 – 8)/ 465} × 100 = **86.02%**

Workings

1. Scheduled Time (total time) = 540 Minutes (9 hrs. × 60 mins.)
2. Planned Down Time = 3 short breaks × 10 minutes +meal break 45 minutes = 75 minutes
3. Net Available Time (NAT) = 540 – 75 = 465 minutes
4. Unplanned Downtime = 30 minutes
5. Net Operating Time (NOT) = Net Available Time – Unplanned Downtime

   NOT = 465 – 30 = 435 minutes
6. Ideal Operating Time (IOT): 12,240 total units / 30 (units per min.) = 12,240 / 30 = 408 minutes
7. Lost Operating Time (LOT): 240 units / 30 (units per min.) = 240 / 30 = 8 minutes

(ii) (A) Seiichi Nakajima in his book, Introduction to TPM (originally published in 1984 and later in 1988 translated into English) suggested that ideal values (World-Class OEE) for the OEE component measures are:

(a) Availability rate in excess of 90 percent

(b) Performance efficiency rate in excess of 95 percent

(c) Quality rate in excess of 99 percent

Such levels of Availability, Performance and Quality would result an ideal OEE scores of approximately 85 percent.

Seiichi Nakajima defined these numbers, based on his practical experience, as minimums for which companies should strive. He also noted that all of the companies winning the Distinguished Plant Prize, awarded annually in Japan to plants that had successfully implemented TPM, had OEE scores in excess of 85%.

In the instant case OEE is **86.02%,** which is beyond the ideal rate of 85% suggested by Seiichi Nakajima. Availability, Performance, and Quality rate is 93.55%, 93.79%, and 98.04% respectively against the ideal rate of 90%, 95% and 99% respectively. **Hence, considering OEE only (rather its individual components) it can be said that machine demonstrate the world class performance.** Both performance and quality rate are **slightly lower** than the ideal rate (world class performance), whereas availability rate is beyond the ideal rate to help the OEE to stand beyond ideal rate of 85%.

(ii) (B) Yes, OEE is an aggregate measure of productivity; comprising the sub-metrics (components) of Availability, Performance and Quality.

When the sub-metrics (components) are multiplied by each other, the resulting OEE number may end up hiding the areas that have the most problems, **because these sub-metrics (components) compensate for each other**. For example, low quality may be compensated by high availability and performance. OEE has another limitation being aggregate measure, it assumes that **each of the sub-metrics have equal importance**; 1% quality loss will be more dangerous than 1% availability loss.

Here is worth noting that calculation of OEE involves multiplication of sub-metrics of Availability, Performance and Quality, which aggravate a failing situation and attract further attention to it. **For example**, if all the sub-metrics has rate of 85% then OEE will be only 61.41%, if all the sub-metrics has rate of 90% then OEE will be 72.90%.

As an aggregate quantitative metric OEE can obfuscate by hiding underlying issues, instead of clarifying areas for improvement, **hence in-depth study of each sub-metrics is essential**.

(b) In a business context, **decentralisation** is the *delegation of decision-making authority* to smaller local units at lower levels of the organisation. This takes some control away from the hub and will often result in an *upward flow of information* – the opposite of what happens in a centralised organisation. An organisation with divisional structure has various divisions *operating autonomously* as business under a broad corporate framework according to geographical areas, markets or products and services; there by limiting the centralized monitoring and scrutinizing of each and every element of functioning. This would spare the top management from deploying time and efforts by sitting on the top at gigantic corporate offices. 'Bennsys' is a good example of a decentralised business. Mr. Benn is managing a staff of over 1,25,000 persons which is earning revenue over $100 billion in revenue with small resources.

Responsibility accounting is apt where top management has a *willingness to delegate the authority* to make decisions. The idea behind the responsibility accounting is that each *manager's performance should be judged* by how well he or she manages those items under his or her control. There are four recognised levels of decentralisation in the context of responsibility accounting which Mr. Benn was referring to are detailed below:

Revenue Centre managers are having control over the generation of revenue from operation with no responsibility for costs.

Cost Centre managers exercise *control over costs* but not revenues and investments. Their responsibility is to minimize the cost of producing a specified level of output or the cost of providing a specified level of service. The objective of cost centre managers is to *improve the efficiency of operations* by finding ways to cut costs and minimize waste.

Profit Centre managers are having *focus on profit*. Their goal is to both maximize revenues and to minimize costs.

Managers of ***Investment Centres*** make decisions that *influence costs, revenues, and investments*. Their responsibility is to maximize the returns from invested capital, or to put the capital invested by owners and shareholders of their organizations to the best profitable use.

Organizations vary considerably in *the* ***extent to which they decentralize*** because decisions about whether and how much to decentralize involves numerous costs and benefits. Moreover, the scale of these costs and benefits depends on specific facts. A major chunk of top management's responsibility is to find out how to maximize the benefits and minimize the costs associated with decentralization. *An organisation can increase benefits by carefully identifying the decisions under each manager's purview, matching the scope of decisions with the manager's skills and knowledge. It can also help lower-level managers in understanding the firm's values, goals, and strategy.* **Mr. Benn clearly expressed the management style that has focus on abdication. Abdication, like**

delegation, involves allocating duties and responsibilities to a team - but *without the measuring and managing part*. It sounds reasonable to believe that Mr Benn's style of functioning leads to the decentralization of decision-making process where in the division heads are free to set selling prices, choose which markets to tap in, make product mix and output decisions and select suppliers.

If decentralized business model is ideally crafted to suit the desired style of functioning, how voluminous the organisation be, could be well managed by the top management by occupying reasonably small space with very minimum number of employees and act on the basis of ***management by exception***.

Question 6

(a) Modem Packaging Corporation specialised in the manufacture of one litre plastic bottles. The firm has four moulding machines, each capable of producing 100 bottles per hour. The firm estimates that the variable cost of producing a plastic bottle is ₹20. The bottles are sold ₹50 each.

Management has been approached by a local toy company that would like the firm to produce a moulded plastic toy for them. The toy company is willing to pay ₹300 per unit for the toy. The variable cost to manufacture the toy will be ₹240. In addition, Modem Packaging Corporation would have to incur a cost of ₹20,00,000 to contract the needed mould exclusively for this order. Because of more intricate shape of the toy, a moulding machine can produce only 40 units per hour. The customer wants 1,00,000 units. Assume that total capacity of all the four machines combined is 10,000 machine hours available during the period in which the toy company wants the delivery of toys.

The firm's fixed cost, excluding the cost-to construct the toy mould, during the same period will be ₹2,00,00,000.

Required

(i) If the management predicts that the demand for its bottles will require the use of 7,500 machine hours or less during the period, should the special order be accepted? Give reasons. ***(3 Marks)***

(ii) If the management predicts that the demand for its bottles will be higher than its ability to produce bottles, should the order be accepted? Why? ***(2 Marks)***

(iii) If the management has located a firm that has just entered the moulded plastic business. This firm has considerable excess capacity and more efficient moulding machines and is willing to subcontract the toy job, or any portion of it for ₹ 280 per unit. It will contract its own toy mould.

DETERMINE Modem Packaging Corporation minimum expected excess machine hour capacity needed to justify producing any portion of the order itself rather than subcontracting it entirely. ***(5 Marks)***

(b) (i) *"Correct balance must be established when budgeted performance is evaluated otherwise it may lead to a feeling that performance appraisal was unjust".*

In furtherance of the above object, three distinct styles, namely Budget Constrained Style, Profit Conscious Style and Non-Accounting Style have been observed for using budget and actual cost information in performance evaluation of a manufacturing division. EXPLAIN each of these styles. ***(3 Marks)***

(ii) *In K Automotive Ltd., an automobile manufacturer, there is a sudden breakdown of one important machine which would delay the shipment of an important order and required to spend more than the repair budget allocation. ANALYZE the likely behavioural aspects of respective departmental heads in this situation under.*

(A) Budget constrained Style

(B) Profit conscious style. ***(2 Marks)***

(iii) *Summarize the effects of the given three styles of management in the below matrix in Table B by putting a suitably coined word given in Table A for each of the specified activity.*

Table A

High	*Medium*	*Low*	*Extensive*	*Little*	*Good*	*Poor*

Table B

Activity	***Style of Evaluation***		
	Budget Constrained	***Profit Conscious***	***Non-Accounting***
Involvement with Costs			
Job related tension			
Manipulation of Accounting			
Information			
Relation with superiors			
Relation with Colleagues			

(5 Marks)

Answer

(a) Workings

Statement Showing "Contribution / Machine Hour"

	'Bottle'	**'Toy'**
Sales (₹ /u)	50.00	300.00
Less: Variable Cost (₹ /u)	20.00	240.00
Less: Specific Fixed Cost (₹ /u)	---	20.00

Contribution (₹ /u)	**30.00**	**40.00**
Machine Hours Required per unit	0.01	0.025
Contribution / Machine Hour	**3,000**	**1,600**

(i) Modern Packaging Corporation can accept plastic moulded toy's order as sufficient number of hrs. i.e., 2,500 hrs. (10,000 hrs.- 7,500 hrs.) are available and would be able to generate additional benefit of ₹ 40.00 per unit on 1,00,000 units of toys i.e., **₹ 40,00,000.**

(ii) If the demand for bottle is higher, then more hrs. will be required to produce the additional bottles. Modern Packaging has to decide whether to utilize 2,500 hrs. for bottles or for toy Order.

Machine time is limiting factor. Therefore, contribution per machine hour from both the activities (i.e., bottles and toys) should be calculated to decide whether the order should be accepted. Contribution per hour is less in case of toys (refer workings). Therefore, Modern Packaging should utilize the remaining 2,500 hours for manufacturing bottles rather than to fulfil the order for supply of toys.

Prioritizing production based on contribution per machine hour would maximize profits.

(iii) Minimum number of toys needed to be manufactured to justify the increase in fixed cost of ₹ 20,00,000 to make the mould is 50,000 toys {20,00,000/ (₹ 280 - ₹ 240}. Thus, as long as company has excess capacity available to manufacture more than **50,000 toys** it is cheaper ***to produce*** than to buy from subcontractor.

Minimum Expected Excess Machine Hour Capacity to justify = $\left(\frac{50,000 \text{ toys}}{40 \text{ toys}}\right)$

= 1,250 hours

(b) (i) Yes, correct balance must be established when budgeted performance is evaluated otherwise it may lead to a feeling that performance appraisal was unjust; due to *behavioural aspects* of budgeting. Hofstede (1968) found that stress on the actual results in performance evaluation led to more extensive use of budgetary information, and this made the budget more relevant. However, this stress was associated with a feeling that the performance appraisal was unjust. To overcome this problem, the *correct balance must be established* when the budgeted performance is evaluated.

Anthony George Hopwood carried out research into the manufacturing division of a US steelworks, wherein he studies more than 200 managers with cost centre responsibility in year 1973. A G Hopwood identified three distinct styles of using budgetary information to evaluate management performance, which he expressed in 'An Accounting System and Managerial Behaviour'.

Budget constrained style – under this performance of manager who is responsible for cost centre shall be evaluated **based on ability to achieve budget in the short term**. Hence behaviour problems like short-term decision making at the expense of long-term gain, manipulation of data, and poor working relations with colleagues etc. may emerge.

Profit conscious style – under this performance of manager who is responsible for cost centre is evaluated **based upon their ability to increase the long-term effectiveness of their division**. Here budget is considered as guidelines rather a strict target hence one cannot say budgets are ignored but can say budgets are interpreted flexibly. This style led to better working relations and little manipulation of accounting information due to less or moderate job-related pressure.

Non-accounting style – under this performance of manager is evaluated mainly on **non-accounting performance indicators** such as quality and customer satisfaction, **hence budget and budgetary information does not play a substantial or important role in evaluation**.

(ii) Behavioural problems are often linked to different management styles; budgeting is not an exception.

(A) Under **budget constrained style** since the performance of manager of cost centre shall be evaluated on ability to achieve budget in the short term, hence **manager will be criticised in case of spending exceeds the set limit**. Managerial behaviour oriented to short-term decision making at the expense of long-term gain; hence in order to keep expense within the budgeted limit, departmental head is likely to take decision of **'not spending more than the repair budget allocated'.**

(B) Under **profit conscious style** since the performance of manager of cost centre shall be evaluated based upon their ability to increase the long-term effectiveness of their division, hence a **manager will be prepared to exceed the budgetary limit in the short term if this will result in an increase in long term profit**. Managerial behaviour oriented to long term effectiveness; hence departmental head is not hesitated to spend beyond the set budgeted limit to enable the organisation to meet customer requirements. Here manager likely to take decision of **'spending more than the repair budget allocated'** so that delay of shipment of an important order can be avoided.

(iii) Table – B

Activity	Style of Evaluation		
	Budget Constrained	Profit Conscious	Non-Accounting
Involvement with cost	High	High	Low
Job related tension	High	Medium	Medium
Manipulation of accounting information	Extensive	Little	Little
Relation with superiors	Poor	Good	Good
Relation with colleagues	Poor	Good	Good