

MOCK TEST PAPER – 2

FINAL COURSE: GROUP – II

PAPER – 5: STRATEGIC COST MANAGEMENT AND PERFORMANCE EVALUATION

SUGGESTED ANSWERS/HINTS

1. The **supply chain** is a network that consists of the flow of materials, goods, and related information among manufacturers, suppliers, retailers, and consumers. The supply chain can be divided into two parts based upon flow, directions, or source and destination. Towards the supplier side, it is termed as **Upstream Supply Chain** and towards the consumer side, it is termed as **Downstream Supply Chain**.

Nations' Mart can enhance its brand recognition through Upstream Supply Chain Management in the following ways–

Process of placing the order

Nations' Mart should review the process of placing the order, ***e-procurement shall be introduced*** to the possible extent and information shall be shared with the manufacturers and suppliers allowing the suppliers' access to forecast demand. Which in turn reduces costs and improves the efficiency of the supply chain at suppliers' end and the same will benefit Nations' Mart for sure.

Note - This will lead to an *extended value chain* that will be capable to generate enhanced value.

Inbound logistics

Nations' Mart can revamp its logistics in either of the following ways–

- i. *Develop in-house logistics capabilities* – Nations' Mart can look forward to owning the trucks and tempos to develop in-house logistics capabilities, it can apply its logo on the entire fleet this will enhance the brand visibility.
- ii. *Use third-party logistics* rather than manufacturers and their established suppliers and that too in conjunction with a review of its outbound logistics.

The cost of inbound logistics can be offset by reduced prices (FOB rather than CIF) by such manufacturers and their established suppliers.

Note– a detailed cost-benefit analysis shall be conducted to assess whether these options are financially viable.

Outsourcing of the warehousing and re-packaging

Nations' Mart may look for an ***integrated logistic partner*** who also offers storage and warehousing solutions, since it will be a large contract (especially, if consolidated for all the warehousing needs of Nations' Mart), for any integrated logistic partner hence able to ***negotiate a good price***.

Note– It is a strategic decision because if the warehousing and re-packaging are outsourced then Nation's Mart can strategically reposition itself and focus on brand awareness, hence further **critical evaluation of core capabilities and competencies** is required.

Nations' Mart can enhance its brand recognition and address the issue raised by franchisee regarding inflexible ordering and delivery system through Downstream Supply Chain Management in the following ways–

Shift to pull model of the supply chain

The inflexibility of the ordering and delivery system can be eliminated, if Nations' Mart shifts to the pull model of the supply chain. This enables the franchisee (local kirana shops and departmental stores) to have **flexibility while ordering (quantity and time)** to match their need as per actual demand.

Note– This may result in *low overall demand*, which may cause Nations' Mart **not able to get the same substantial discount** which earlier it is getting from manufacturers or from their established suppliers.

But if the *existing practices continued* then Nations' Mart **may lose some of the franchisee** (local kirana shops and departmental stores), hence cost-benefit analysis is essential.

Use of IT solution

In order to streamline the downstream supply chain, Nations' Mart need to use IT solution (especially if the shift to the demand-driven system) for following purposes–

- i. To collect and consolidate the orders from the local kirana shops and departmental stores for each Item individually and further place the order accordingly.
- ii. Use of E-POS (electronic point of sale) at local kirana shops and departmental stores to have an **overview of sales information, stock level, and customers' buying habits and trends**. This will auto streamline the ordering and distribution. This will result in an extended value chain, hence, may be able to generate greater value for customer.

Note– If IT is used extensively then Nations' Mart can directly reach consumers through the **E-Commerce platform**. The terms of the **franchise agreement need to be analyzed** to judge the viability of direct sales by Nations' Mart.

Note– If local kirana shops and departmental stores allowed to place orders online then the **sales representative** which earlier responsible for meeting with these local kirana shops and departmental stores **can be deployed for marketing and branding activities**.

Outbound logistics and distribution arrangements

As mentioned earlier Nations' Mart can club the contract regarding inbound and outbound logistic requirements to negotiate with the logistic contractors. In regard to outbound logistics specifically, rather than relying upon local haulage contractors for regional warehouses, *Nations' Mart can go for one single integrated logistics company*. This single contract will afford **economies of scale**.

As mentioned earlier too **own logistic abilities** can be developed by owning a fleet of vehicles which can be used for *greater brand visibility* by putting the logos and advertisement material on such vehicles. **Scheduling of routes** shall be done scientifically using some operation research methods such as *transportation* and *linear programming*.

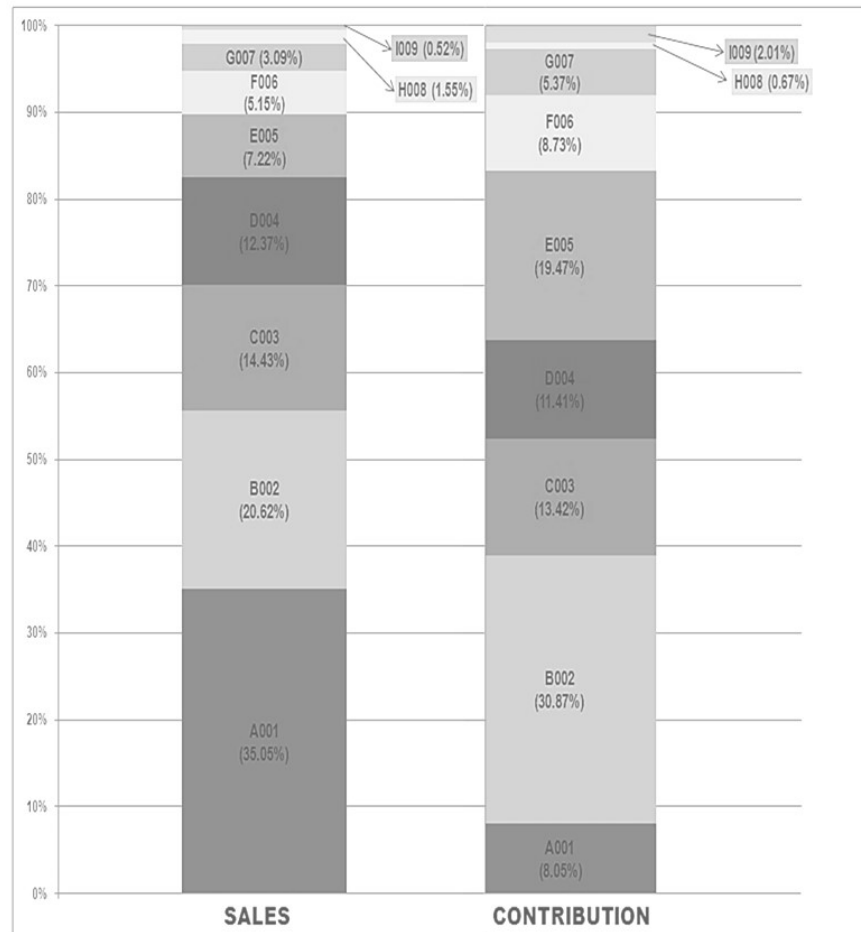
Note– The costs and benefits analysis shall be performed before a decision on such a change.

2. (i) "Pareto Analysis"

Model	Sales (Rs,'000)	% of Total Sales	Cumulative Total	Model	Cont. (Rs,'000)	% of Total Cont.	Cumulative Total %
Pareto Analysis Sales				Pareto Analysis Contribution			
A001	5,100	35.05%	35.05%	B002	690	30.87%	30.87%
B002	3,000	20.62%	55.67%	E005	435	19.47%*	50.34%
C003	2,100	14.43%	70.10%	C003	300	13.42%	63.76%
D004	1,800	12.37%	82.47%	D004	255	11.41%	75.17%
E005	1,050	7.22%	89.69%	F006	195	8.73%*	83.90%
F006	750	5.15%	94.84%	A001	180	8.05%	91.95%
G007	450	3.09%	97.93%	G007	120	5.37%	97.32%
H008	225	1.55%	99.48%	I009	45	2.01%	99.33%
I009	75	0.52%	100.00%	H008	15	0.67%	100.00%
	14,550	100.00%			2,235	100.00%	

(*) Rounding - off difference adjusted.

Diagram Showing “Sales and Contribution”



(ii) Recommendations

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

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

In present case, five models namely A001, B002, C003, D004 account for 80% of total sales where as 80% of the company's contribution is derived from models B002, E005, C003, D004 and F006.

Models B002 and E005 together account for 50.34% of total contribution but having only 27.84% share in total sales. So, these two models are the key models and should be the top priority of management. Both C003 and D004 are among the models giving 80% of total contribution as well as 80% of total sales so; they can also be clubbed with B002 and E005 as key models. Management of the company should allocate maximum resources to these four models.

Model F006 features among the models giving 80% of total contribution with relatively lower share in total sales. Management should focus on its promotional activities.

Model A001 accounts for 35.05% of total sales with only 8.05% share in total contribution. Company should review its pricing structure to enhance its contribution.

Models G007, H008 and I009 have lower share in both total sales as well as contribution. Company can delegate the pricing decision of these models to the lower levels of management, thus freeing themselves to focus on the pricing decisions for key models.

3. (i) **ROI**

Division 'Z'

Controllable Profit = Rs.5,290K

Net Assets = Rs.19,520k + Rs. 4,960K – Rs.5,920K = Rs.18,560K

ROI = 28.5%

Division 'E'

Controllable profit = Rs.3,940K

Net Assets = Rs.29,960K + Rs.6,520K – Rs.2,800K = Rs.33,680K

ROI = 11.7%

In computation of ROI of both division, *controllable profit* has been taken into consideration. The reason behind this is that the Head Office costs are not controllable and responsibility accounting considers that managers should only be held responsible for costs over which they have control. The assets figures being used also depend on the same principal. Figures of current assets and the current liabilities have been taken into consideration as they are such items over which managers have complete control.

(ii) Bonus

Bonus to be paid for *each percentage point* = Rs.7,20,000 × 3% = Rs.21,600

Maximum Bonus = Rs.7,20,000 × 20% = Rs.1,44,000

Division 'Z'

ROI = 28.5% (16 whole percentage points above minimum ROI)

16 × Rs. 21,600 = Rs.3,45,600

Therefore, manager will be paid the bonus of Rs.1,44,000 (max.)

Division 'E'

ROI = 11.7% (Zero, percentage point above minimum)

Therefore Bonus = NIL

(iii) Discussion

FAI will not receive any bonus since he has not earned any point above minimum percentage. This is due to the large asset base on which the ROI figure has been computed. Total assets of Division 'E' are almost double the total assets of Division 'Z'. The major reason behind this is that Division 'E' invested Rs.13.6 million in new equipment during the year. If this investment were not made, net assets would have been only Rs.20.08 million and the ROI for Division 'E' would have been 19.62% resulting in payment of a bonus Rs.1,44,000 (7 × Rs.21,600 = Rs.1,51,200; subject to maximum of Rs.1,44,000) rather than the nothing. FAI is being penalized for making decisions which are in the best interests of his division. It is very surprising that he decided to invest where he knew that he would receive lesser bonus subsequently. He acted in the best interests of the X Ltd. altogether. On the other hand, HAI has taken benefit from the fact that he has not invested anything even though it was needed for computer system updation. This is an example of sub-optimal decision making.

Further, Division 'Z's trade payables are over double those of Division 'E'. In part, one would expect this due to higher sales (almost 66% more than Division 'E') and low cash levels at Division 'Z'. Higher trade payable leads to reduction in net assets figures. The fact that X Ltd. is rewarding HAI with bonus, even though relationships with suppliers may be badly affected, is again a case of sub-optimal decision making.

If the profit margin (excluding head office cost) as percentage of sales is calculated, it comes to 18.24% for Division 'Z' and 22.64% for Division 'E'. Therefore it can be seen that Division 'E' is performing better if capital employed is ignored. ROI is simply making the division 'E's performance worse.

FAI might feel extremely disappointed by getting nothing and in the future, he may opt to postpone the investment to increase the bonus. Non- investing in new technology and equipment will mean that the X Ltd. will not be kept updated with industry changes and its overall future competitiveness will be affected.

Briefly, the use of ROI is resulting in sub-optimal decision making and a lack of goal congruence i.e. what is good for the managers is not good for the company and vice versa. Fortunately, Division 'E's manager still seems to be acting for the benefit of the X Ltd. but the other manager is not. The fact that one manager is receiving a much bigger bonus than the other is not justifiable here and may result in conflict in long run. This is disappointing for the company especially in the situation when the divisions need to work in unison.

4. (a) For each day, 'F' spends Rs.360 per clerk (Rs.90 per hr. $\times$ 4 hrs.). Therefore, 'F' spends Rs.1,080 per day to employ three clerks. Annually, this outlay amounts to Rs.2,59,200 (Rs.1,080 per day $\times$ 240 days).

Over five years, the outlay would be Rs.12,96,000. If the WCMS is implemented, the initial cost is Rs.1,25,000. If we add the annual cost of Rs.36,000, the total cost over five years amounts to Rs.3,05,000. Since one clerk will be needed as well, 'F' has to incur Rs.4,32,000 over five years to pay clerk (Rs.4,32,000 = Rs.90 $\times$ 4 hrs. $\times$ 1 clerk $\times$ 240 days $\times$ 5 years). Therefore, the total cost of this option is Rs.7,37,000.

Accordingly, there is cost saving of Rs.5,59,000 from WCMS implementation.

Relevant Non-Financial Considerations

The WCMS may be a lot more efficient, but more rigid. For instance, what if, a student forgets to bring his/ her card or transaction failure due to connectivity issue, and may not have enough cash to pay. Automated systems may be less able to handle these situations. Having clerks may add an aspect of flexibility and a human aspect that is hard to quantify.

Conclusion

Obviously, WCMS option is more cost effective for 'F' because there is a cost saving of Rs.5,59,000. But, non- financial factors should also be taken into consideration.

OR

- a. Pricing Below Marginal Cost
- b. Skimming Pricing
- c. Premium Pricing
- d. Market Price
- e. Any Cash Realizable Value

(b) Decision Making – P Ltd.

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

In the given scenario, a customer who contributes close to 60% of P Ltd.'s profits has been making turnaround demands that are unreasonable for the company employees to meet. P Ltd. has to decide whether to continue doing business with the customer based on the current terms or protecting the work environment of its employees. In the current scenario, it is in P's long term interests to protect its employees' rights (a non-financial consideration). Keeping this approach in mind, P Ltd. decided to terminate business with the profitable client. While this had a significant impact on revenues in the short term, in the long run P Ltd. was able to get business from new clients. Also, realizing the value of service provided, the dropped client came back with projects on equitable terms. Therefore, even though it did not make financial sense in the short run, decisions based on non-financial metrics played an important role in ensuring P Ltd.'s long term sustainability.

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

- (a) Quality of goods produced outside vs. in-house production of the component. Outsourcing or buying a component from the external market, should not impact the overall quality of the product. Therefore, *any component critical for a product would generally not be outsourced unless its supplier gives quality assurance.*
- (b) *Reliability of suppliers* in the outsourcing arrangement. Assurance must be given by the supplier in terms of both quality and timely delivery of components for the given price. Also, there must be a sufficient pool of suppliers from whom the company can buy the product. If one supplier closes shop, there must be alternate suppliers available.
- (c) *Availability of skilled labor and infrastructure* to make the component in-house. If not available, then the component may have to be bought from the external market.

- (d) *Regularity of demand for the product* – If made in-house, seasonal demand for a product may result in the risk of holding high inventories (including that of raw materials) or making high capital investments that will prove unproductive during off-season. Therefore, *outsourcing or buying from external market may be more viable when the demand for the final product is seasonal.*
- (e) *Risk of technological obsolescence for the component* – when the risk is higher company may favor outsourcing.
- (f) *Confidentiality of process or patent of process* – Confidential processes or critical components may not be outsourced.
- (g) The shutting down of company's manufacturing facility might have a negative impact on the morale of remaining employees.

(c) (i)

Customer's Profitability Statement

Particulars	Customer- 'Ax'	Customer- 'Bx'
Sales (units)	350	500
	Rs.	Rs.
Selling Price <i>per unit</i>	5,400	5,400
Less: Discount (Quantity)	270 (Rs.5,400 × 5%)	270 (Rs.5,400 × 5%)
Less: Discount (Delivery)	---	432 (`5,400 × 8%)
Selling Price (Net of Discounts) <i>per unit</i>	5,130	4,698
Less: Variable Cost <i>per unit</i>	4,420	4,420
Contribution <i>per unit</i>	710	278
Total Contribution	2,48,500 (Rs.710 × 350 units)	1,39,000 (Rs.278 × 500 units)
Less: Additional Overheads		
Delivery Cost	17,500 (5 × Rs.3,500)	---
Order Processing Cost	10,000 (5 × Rs.2,000)	20,000 (10 × Rs.2,000)
Profit <i>per customer*</i>	2,21,000	1,19,000
Profit <i>per customer per unit</i>	631.43	238.00

Analysis

Even though Ax has lower sales volume (30% lesser from 'Bx'), it is contributing almost double profit that is being contributed by 'Bx' as overall discount offered to customer 'Ax' is quite less.

(ii) Comments on the "Discount Policy on Delivery"

Discount on delivery offered to customer 'Bx' is Rs.432 *per unit*. If transport for delivery is provided to customer 'Bx' then the cost would have been Rs.70 *per unit* (10 deliveries $\times$ Rs.3,500 / 500 units), which is lesser by Rs.362. It may also be noted that delivery cost in case of customer 'Ax' is only Rs.50 per unit (Rs.17,500 $\div$ 350 units). Hence, company needs to review discount policy on delivery but significance of profitability of customer 'Bx' should also be kept in mind while doing so.

5. (a) (i) N₂N has the opportunity to utilize 10 units of non-moving chemical as input to produce 10 units of a product demanded by one of its customers. The minimum unit price to be charged to the customer would be—

Cost Component	Cost per unit of product (Rs.)
Cost of Material (Realizable value = Rs.3,500 / 10 units of chemical)	350
Out of Pocket Expenses	50
Other Material Cost	80
Minimum Unit Price that can be charged	480

Therefore, the minimum unit price that can be charged to the customer, without incurring any loss is Rs.480 per unit of product. As explained below in point (ii), allocated overhead expenses and labor cost are sunk costs that have been ignored while calculating the minimum unit price to be charged.

(ii) Analysis

- (a) Cost of Material: Relevant and hence included at realizable value. N₂N has 10 units of non-moving chemical input that has a book value of Rs.2,400, realizable value of Rs.3,500 and replacement cost of Rs.4,200. Realizable value of Rs.3,500 would be the salvage value of the chemical had it been sold by N₂N instead of using it to meet the current order. This

represents an opportunity cost for the company and hence included while pricing the product. Book value would represent the cost at which the inventory has been recorded in the books, a sunk cost that has been ignored. Replacement cost of Rs.4,200 would be the current market price to procure 10 units of the input chemical. This would be relevant only when the inventory has to be replenished after use. This chemical is from the non-moving category, that means that it is not used regularly in production process and hence need not be replenished after use. Therefore, replacement cost is also ignored for pricing.

- (b) Labour Cost: Not relevant and hence excluded from pricing. It is given in the problem that this order would be met by permanent employees of the company. Permanent employee cost is a fixed cost that N₂N would incur irrespective of whether this order is produced or not. No additional labour is being employed to meet this order. Therefore, this cost is a sunk cost, excluded from pricing.
- (c) Allocated Overhead Expenses: These expenses have been incurred at another Cost Centre, typical example would be office and administration costs. Such costs are fixed in nature that would be incurred irrespective of whether this order is produced or not. Therefore, this cost is a sunk cost, excluded from pricing.
- (d) Out of Pocket Expenses: These are expenses that are incurred to meet the production requirement of this order. These are additional variable expenses, that need to be included in pricing.
- (e) Other Material Costs: These are expenses that are incurred to meet the production requirement of this order. These are additional variable expenses, that need to be included in pricing.

(iii) Advice on Pricing Policy

Under perfect competition conditions, N₂N can have no pricing policy of its own, here sellers are price takers. It cannot increase its price beyond the current market price. The company can only decide on the quantity to sell and continue to produce as long as the marginal cost is recovered. When marginal cost exceeds the selling price, the company starts incurring a loss.

Since N₂N cannot control the selling price individually in the market, it can adopt the *going rate pricing* method. Here it can keep its selling price at the average level charged by the industry. This would yield a fair return to the company. An average selling price would help the company attract a *fair market share* in competitive conditions.

(b) (i) Traditional Variances

$$\begin{aligned}\text{Usage Variance} &= (12,000 \text{ lt.} - 12,800 \text{ lt.}) \times \text{Rs. } 15.00 \\ &= \text{Rs. } 12,000 \text{ (A)} \\ \text{Price Variance} &= (\text{Rs. } 15.00 - \text{Rs. } 16.40) \times 12,800 \text{ lt.} \\ &= \text{Rs. } 17,920 \text{ (A)} \\ \text{Total Variance} &= \text{Rs. } 12,000 \text{ (A)} + \text{Rs. } 17,920 \text{ (A)} \\ &= \text{Rs. } 29,920 \text{ (A)}\end{aligned}$$

Operational Variances

$$\begin{aligned}\text{Usage Variance} &= (12,000 \text{ lt.} - 12,800 \text{ lt.}) \times \text{Rs. } 16.00 \\ &= \text{Rs. } 12,800 \text{ (A)} \\ \text{Price Variance} &= (\text{Rs. } 16.00 - \text{Rs. } 16.40) \times 12,800 \text{ lt.} \\ &= \text{Rs. } 5,120 \text{ (A)} \\ \text{Total Variance} &= \text{Rs. } 12,800 \text{ (A)} + \text{Rs. } 5,120 \text{ (A)} \\ &= \text{Rs. } 17,920 \text{ (A)}\end{aligned}$$

Planning Variances

$$\begin{aligned}\text{Controllable Variance} &= (\text{Rs. } 15.40 - \text{Rs. } 16.00) \times 12,000 \text{ lt.} \\ &= \text{Rs. } 7,200 \text{ (A)}\end{aligned}$$

$$\begin{aligned}\text{Uncontrollable Variance} &= (\text{Rs. } 15.00 - \text{Rs. } 15.40) \times 12,000 \text{ lt.} \\ &= \text{Rs. } 4,800 \text{ (A)} \\ \text{Total Variance} &= \text{Rs. } 7,200 \text{ (A)} + \text{Rs. } 4,800 \text{ (A)} \\ &= \text{Rs. } 12,000 \text{ (A)}\end{aligned}$$

$$\begin{aligned}\text{Reconciliation} &= \text{Rs. } 17,920 \text{ (A)} + \text{Rs. } 12,000 \text{ (A)} \\ &= \text{Rs. } 29,920 \text{ (A)}\end{aligned}$$



Direct Material Usage Operational Variance using *Standard Price*, and the Direct Material Price Planning Variance based on *Actual Quantity* can also be calculated. This approach reconciles the Direct Material Price Variance and Direct Material Usage Variance calculated in part.

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

In GRV, as per traditional approach total variances are Rs.29,920 (adverse), out of which Rs.17,920 (adverse) accounts for total operational variance and Rs.12,000 (adverse) is for total planning variance. It is necessary to analyse planning variances further. The planning variance of Rs.12,000 (adverse) can be divided into an *uncontrollable* adverse variance of Rs.4,800 and a *controllable* adverse variance of Rs. 7,200. Similarly, total operational variance can be sub classified as adverse price variance of Rs.5,120 and adverse usage variance of Rs.12,800. This analysis gives a clearer indication of the inefficiency of the purchasing function by the concerned department. Performance of the staff of the purchasing department should be evaluated/rewarded/ based on variances which are *controllable*. If an adverse *uncontrollable* variance of Rs.4,800 is reported in the performance reports this is likely to lead to dysfunctional motivation effects to the purchase department.

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

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

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



Conceptually correct *brief explanations* are sufficient.

6. (i) **Cost of Quality Statement**

Particulars of Costs	Cost Incurred (Rs.)	% of Total Costs of Quality
Preventive Costs:		
Employee training	1,20,000	5.85%
Appraisal Costs:		
Testing	1,70,000	8.29%
Internal Failure Costs:		
Rework	3,00,000	17.08%
Cost of rejected units	50,000	
External Failure Costs:		
Lost profits from lost sales due to impaired reputation	8,10,000	68.78%
Sales return processing	1,75,000	
Warranty costs	4,25,000	
Total Cost of Quality	20,50,000	100%

(ii) **Cost Benefit Analysis of New Quality Programme**

Particulars of Costs	Additional (Costs) / Cost Savings (Rs.)	Total New (Costs) / Cost Saving (Rs.)
Preventive Costs:		
Reengineer the production process	(7,50,000)	(8,50,000)
Supplier screening and certification	(30,000)	
Preventive maintenance on equipment	(70,000)	
Appraisal Costs:		
Inspect Raw Materials	(1,20,000)	(1,20,000)
Internal Failure Costs:		
Reduction in rework costs	2,50,000	2,50,000
External Failure Costs:		
Reduction of lost profits from lost sales	8,00,000	12,75,000
Reduction from sales return	1,50,000	
Reduction from warranty costs	3,25,000	
Total savings (costs) from quality programme		5,55,000

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

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

While preventive and appraisal costs would not directly improve the quality of the product, they would definitely reduce internal failure costs like rework costs or external failure costs like sales returns or warranty claims. These would also enhance the reputation of the product for its standard of quality. Conversely, it follows that internal failure costs may be preferable to external failure costs since it affects the company's brand image.

Costs incurred to ensure conformance to quality will ensure higher chances of detection of defects in the product. At the same time ensuring zero defective rate may require huge resources and therefore may be costly. Instead, companies may have the ability to absorb costs incurred due to rework, warranty claims or lost sales. Therefore, they must determine a reasonable threshold defective rate that is acceptable, a normal cost in business operations. Tools for quality production management like Total Quality Management (TQM) will help in determining the optimum cost of quality that the company is willing to bear. TQM focus on continuous improvement of an organization's business activities. This creates an awareness of quality that the company comes to expect from various processes. Things need to be done right the first time, consequently eliminating defects and waste from operations. At the same time, an in-depth knowledge of business processes provides information that can help the management set acceptable threshold limits for reasonable level of defects it is willing to bear.

- (b) There are potential advantages and disadvantages of the involvement of staff in the preparation of the budget.

Potential advantages include:

- Senior staff may agree to accept the targets because they would take ownership of it as their budget.
- Senior staff may have a better understanding of what results can be achieved and at what costs. For example, they may have a better knowledge of individual courses and how they may be delivered more efficiently and cost effectively.
- Senior staff cannot blame unrealistic goals as an excuse for not achieving budget expectations.
- Senior staff would feel that they are being appreciated for the value that their experience brings to the running of the management school.
- Senior staff may get the opportunity to discuss organisational issues, in which an exchange of information and ideas can help to solve problems and agree future actions.

Potential disadvantages include:

- Senior staff may be excellent academically but could lack the practical knowledge required to formulate their budget.
- Senior staff may limit the benefits of participation due to personality traits of participants.
- Senior staff may consume a great deal of time arguing with each other (and with the school director).

Senior staff may decide among themselves to artificially inflate the proposed budget so that it is easier for them to attain the cost targets they have set.