

MOCK TEST PAPER - 1

FINAL (NEW) COURSE: GROUP – II

PAPER – 5: STRATEGIC COST MANAGEMENT AND PERFORMANCE EVALUATION

SUGGESTED ANSWERS/HINTS

1. KTM electronics manufactures and sells various electronic products through its physical stores. The existing manufacturing system does not take into consider the demand of products in the market. Store managers are allowed to submit only one order per month. A high level of inventory can be seen at KTM Electronics as compared to the industry average. The store managers tend to keep high level of inventories as a safeguard against stock-outs. Whereas, keeping inventory to meet customer requirement is good, high level of inventories due to inefficient processes is not advisable.

The company also has a longer working cycle because of a long order to deliver time and excess holding of inventory. A significant amount of working capital is blocked due to this practice. Technology changes rapidly and the company is expected to roll out latest products in the market. A product like mobile gets outdated very soon and the company has to resort to discounted sales. This results in financial losses to the company.

The company has identified an opportunity in e-commerce. E-commerce businesses require leaner models and faster response time. The production must be based on the demand from the customer and not on an ad-hoc basis. In the following paragraphs, the importance of supply chain management (SCM) and its applicability in the current case is discussed.

**Supply Chain Management (SCM)**

Supply Chain Management can be defined as the management of flow of products, services, and information, which begins from the origin of products and ends at the product's consumption at consumer's end. SCM also involves movement and storage of raw material, work-in-progress and finished goods. In other words, supply chain management involves management of all activities associated with moving goods from the raw materials stage to the end user. An important objective of SCM is to correlate the production and distribution of goods and services with demand of the product.

The following are the various activities which an organisation carries out to meet the customer requirements (Primary activities under value chain model) -

- Inbound Logistics covering procurement and related activities.
- Operations covering conversion of raw materials 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. None of the activities can be looked in silos. In the case of KTM Electronics, there is a restriction on number of orders which a store manager can place. This would lead to excess ordering because of the fear of stock-outs.

The customer demand is completely ignored and hence the production is not in sync with the market demand. This could lead to excess production, higher inventory holding and longer working capital cycles.

The facts presented in the case indicate the following problems at KTM Electronics:

- Production planning is not based on customer demand & is done on an ad-hoc basis.

- Inventory Holding period is very high (45 days against an industry average of 15 days).
- The working capital cycle is longer.
- The time take to fulfil an order from the store is very high.
- The production is dispatched to a central warehouse for further deliveries to the stores. This could be an inefficient process.
- Liquidation of products at discount for products with low shelf life.

### **SCM Process and applicability to KTM Electronics**

The SCM process is explained below:

- **Plan** - The first step in SCM process is to develop a plan to address the requirements of the customer. KTM Electronics must shift its focus from ad hoc and predetermined production planning to understanding the requirements of customers. Production must be planned based on the demand of products. The focus must be on producing what the customer wants.
- **Develop (procure)** - In this step, the materials required for production is sourced from various suppliers. A good relationship with supplier is required to ensure that the parts/materials are received as and when required by the production team. It is also important that the vendors supply quality material which is not the case in KTM Electronics. The company must select suppliers which are dependable and can deliver quality products in the stipulated time. The company must focus in reducing the lead time required for sourcing materials which will reduce the inventory holding period.
- **Make** - The third step is making or manufacturing the products required by the customer. This is quite different from the existing practice in KTM Electronics where store managers are allowed to place only one order. This would mean that the company is not considering the ever changing demands and tastes of the customers.
- **Deliver** - The fourth stage is to deliver the products manufactured for the customers. This stage is concerned with logistics. The time required to deliver to the store in case of KTM Electronics is very high. The company must evaluate if the centralised warehouse is causing delay in delivery of products to the stores.

*Logistics* is one of the important component of the entire supply chain process. Right from procurement of material, movement of raw material in the plants and final delivery of products of customers, logistics play a critical role. An excellent system must be in place to ensure that the movement of materials and final product are uninterrupted.

*Warehousing* also plays an important role in today's business environment. The company has a centralised warehouse to meet the needs of all its stores. This would not be the most efficient way. The company must evaluate creation of additional storage facility which would ensure timely delivery of goods to the stores. Newer products can reach the market faster.

### **Benefits of SCM to KTM Electronics**

SCM looks at the entire value chain process as an integrated process. There is a seamless flow of information and products between suppliers and customers. The customer's requirements would be captured to plan the production. The suppliers would be intimated to supply the materials according the the production plan. An effective logistics system ensures that movement of materials is seamless. KTM Electronics can also consider implementing an integrated ERP which would also interact with vendors on real time basis.

The following benefits of SCM can be envisaged for KTM Electronics -

- Better Customer Service as customer is supplied with what he/she wants in the minimum time.
- Better delivery mechanism for goods.

- Improves productivity across various functions and departments.
- Minimises cost (both direct and indirect).
- Reduces the inventory holding time and improves the working capital cycle.
- Enhances inventory management and assists in implementation of JIT systems.
- Assists companies in minimising wastes and reduce costs.
- Improves supplier relationship.

### **E-Commerce and SCM**

The SCM is the backbone of E-commerce industry. Customers buying products online want deliveries to be faster. Another distinct feature of e-commerce is that buyers could be located in any corner of the country and not just restricted to the cities where KTM Limited has physical presence. This definitely means that the company must have an effective Supply Chain Management in place which could meet the customer's requirement.

The existing practice of one order per month from each store would not work in the e-commerce space. Orders can come at any time and from anywhere. Supply Chain Management would be required for success of e-commerce business.

#### ***Customer Orders***

The company must have an effective mechanism to capture customer orders and feed it into the production planning on a real-time basis. An integrated ERP system would be required for this purpose. Any delay in intimating the production team would mean delay in production and delivery which would not be taken positively by the customers. The existing system of one order per month from a store would not fit the purpose. A real-time flow of information would mean lower inventory holding.

#### ***Procurement***

The material requirements must be communicated to suppliers seamlessly. The company must identify those vendors who can deliver quality materials in the required time frame. A delay in supplies would delay the production process. A company cannot afford this in e-commerce business. Automatic exchange of information using EDI (Electronic Data Interchange) or Integrated ERP systems would ensure that the vendors receive material requirements in a timely manner.

#### ***Production***

As discussed earlier, the production must be in accordance with the customer order. This requires a shift in approach of the production team. Business environments have shifted from "Customer will buy what we produce" to "We have to produce what the customers require". The company would ideally not produce products to store them and sell later.

#### ***Logistics***

Logistics would be the backbone of entire e-commerce set up. Right from sourcing of materials to delivery of products at the customer's door step, logistics would play an important role. If the company has an in-house logistics facility, the logistics team must be trained with the requirement of the new business. If the company has outsourced the logistics, vendors must be briefed about the requirements of the e-commerce. The company might have to tie up with new logistic vendors to avoid any delay in deliveries.

2. (i) Customer demand for Cool Air's products is 100,000 units per annum. However, 5,000 defective units supplied are to be replaced free of charge by the company. Therefore, the total number of items supplied to customers per annum = 100,000 + 5,000 units = 105,000 units. The cost of replacement would include raw material cost, assembly & machining cost and delivery cost of

5,000 units = 5,000 units × (900+500+100) per unit = 5,000 units × Rs.1,500 per unit = Rs.75,00,000 per annum. Further, had the sale returns not happened, market share would have increased by 50,000 units. Contribution is Rs.1,000 per unit, for 50,000 units contribution would be Rs.5,00,00,000. Therefore, the cost of poor quality per annum = cost of replacement + contribution from lost sales = Rs.75,00,000 + Rs.5,00,00,000 = Rs.5,75,00,000 per annum.

- (ii) Inspection at the end of the process would detect defects before delivery to the customers. This would ensure that the sale returns would be nil. Given in the problem, 5,000 units supplied are defective and would need to be replaced, in other words, they need to be manufactured again. In other words, inspection after production, before delivery to customers would not prevent production of defective units. However, compared to the current scenario, since these defective units have not yet been delivered to the customer, the cost for additional delivery of replaced products would be saved. This savings in the extra delivery cost = 5,000 units × Rs.100 per unit = Rs.5,00,000 per annum. Further, had the sale returns not happened, market share would have increased by 50,000 units. Contribution is Rs.1,000 per unit, for 50,000 units it would be Rs.5,00,00,000 per annum. Therefore, the total benefit from the inspection process before delivery to customers = savings on delivery costs + contribution from incremental sales = Rs.5,00,000 + Rs.5,00,00,000 = Rs.5,05,00,000 per annum. The cost to the company to maintain good quality of its products through inspection = Rs.2,00,00,000 per annum. Therefore, the net benefit to the company would be Rs.3,05,00,000.
- (iii) Inspection of raw material at the procurement stage could entirely eliminate defective production. The benefit would be two-fold, the current replacement cost for 5,000 units will no longer be incurred. Secondly, due to better customer perception, market share would increase, resulting in an increased contribution / revenue to the company. In other words, the cost of poor quality will be nil.

As explained in solution (i), the cost of poor quality per annum = cost of replacement + contribution from lost sales = Rs.75,00,000 + Rs.5,00,00,000 = Rs.5,75,00,000 per annum. This would be the benefit by implementing the proposal.

Cool Air has to incur an inspection cost to ensure this highest standard of quality (0% defects) which would cost Rs.4,00,00,000 per annum. Therefore, the net benefit to the company would be Rs.1,75,00,000 per annum.

- (iv) (a) The proposal to implement inspection immediately before delivering goods to the customers results in a net benefit of Rs.3,05,00,000 per annum. Alternately, the proposal to implement inspection at the raw material procurement stage results in a net benefit of Rs.1,75,00,000 per annum. Therefore, from a profitability point of view, inspection immediately before delivery of goods to the customer would be the preferred option.
- (b) The drawback of inspection at the end of the production process is that (1) it cannot prevent production of defective goods and (2) information regarding the root cause of defective production, in this case, supply of defective raw materials will not get tracked. Therefore, inspection at the end of production does not contribute to resolving the root cause of defective production. On the other hand, inspection at the procurement stage can eliminate production of defective goods. This will ensure a much higher quality of production, better utilization of resources and production capacity. Therefore, from a long-term strategy point of view, inspection at the raw material procurement stage will be very beneficial. Currently the cost of ensuring this highest quality of production (0% defects) is Rs.4 crore per annum. The cost of ensuring 100% quality is quite high, such that the net benefit to the company is lesser than the other proposal. However, due to its long-term benefit, Cool Air may consider some minimum essential quality control checks at the procurement stage. Although selective quality check might not ensure complete elimination of defective production, it can contribute towards reducing it. At the same time cost of selective quality check would not be

so high as to override its benefits. To determine the extent of quality control inspection, Cool Air should determine its tolerance limit for defective production and do an analysis of the quality / cost tradeoff.

### 3. Report

**To: CEO, Beta Control**

**From: Performance Management Expert**

**Date: 12<sup>th</sup> Feb 2019**

**Subject: Evaluation of EVA at Beta Control**

EVA provides a link between decisions, performance measures and rewards, which focuses managers on performing better. Incentive schemes based on EVA provide better quality information and motivation in making decision which in turn maximise shareholder's wealth. In other words, EVA links the operating returns to the assets that were used to generate those returns. The learning which flows from EVA analyses can be perceptive and can allow the manager not only to identify areas of weakness in performance but also to easily find solutions. BC is a multiproduct company having number of factory sites. EVA can help to appraise divisional contributors to, or detractors from, overall profitability. Thus, managers may be educated through EVA and pursue such objectives that improve operating profits investing more capital.

In addition, this report deals with evaluation of the accuracy and assumptions used in the calculation of BC's EVA. There are many errors in the present calculation of EVA. These have been discussed below and revised calculations are enclosed.

- Non-Cash Expenses have been correctly added back to the profit as these are expenses which do not affect the cash flow of a given period.
- Addition back of Marketing Expenditure is also correct as spending contributes to *future value-creation*. For the same reason, the *prior year spending* is also added in to capital employed.
- Training and Development Expenses should be capitalised. Training and Development Expenses have been treated as an expense in the income statement, they should be added back to profit, and added to capital employed (at the end of the year).
- Research and Development (R & D) Expenses should be treated as marketing expenditure for long period.
- The tax expenses in the EVA calculation should be the tax *paid* with adjustment for lost tax relief on interest and not the adjusted amount of tax *charged* in the accounts.
- The WACC is incorrect because it should be based on post-tax cost of debt.
- Generally, a company takes, at least, a year's time to earn a return on investment. Thus, the capital employed figure should be based on the beginning numbers.

#### NOPAT

Particulars	Year ended 31 <sup>st</sup> March 2018
	Rs. in Lacs
Operating Profit	1,102.80
<i>Add:</i>	
Non-Cash Expenses	30.20
Marketing Expenditure Capitalised	46.20
Training & Development Expenses	80.00

R & D Expenses	20.00
Less:	
Tax	260.00
Lost Tax Relief on Interest	48.96
Net Operating Profit After Tax (NOPAT)	970.24

### Capital Employed

	Rs. in Lacs
From the Statement of Financial Position (Starting)	4,564.00
Marketing Expenditure Capitalized	46.20
Adjusted Capital Employed	4,610.20

$$\begin{aligned} \text{WACC} &= (1/2 \times 15\%) + (1/2 \times 7.8\% \times 70\%) \\ &= 10.23\% \end{aligned}$$

$$\begin{aligned} \text{EVA} &= \text{NOPAT} - (\text{WACC} \times \text{Capital Employed}) \\ &= \text{Rs. } 970.24 \text{ L} - \text{Rs. } 4,610.20 \text{ L} \times 10.23\% \\ &= \text{Rs. } 498.62 \text{ L} \end{aligned}$$

The recomputed EVA has increased from Rs.307.95 Lacs to Rs.498.62 Lacs which shows a positive position for BC as it adds up the shareholder's wealth.



**For calculating NOPAT, following most common adjustments to accounting profit as remarked by the Stern Stewart has been considered.**

- For Advertising, Research and Development Items expensed, Staff Training
  - Impact on Profit: Increase CY's profit, deduct economic depreciation on PY's EVA adjustment.
  - Impact on Capital Employed: Increase capital employed at the end of the year, increase capital employed in respect of similar add backs of PY's investments not treated as such in financial statements (net of economic depreciation).
- For Depreciation
  - Impact on Profit: Add accounting depreciation and subtract economic depreciation.
  - Impact on Capital Employed: Alter value of non-current assets (and capital employed) to reflect economic depreciation not accounting depreciation.
- For Non- Cash Expenses
  - Impact on Profit: Add back to profit.
  - Impact on Capital Employed: Add to retained profits at the end of the year.
- For tax charge, this will be based on 'cash taxes' rather than the accruals based methods used in financial reporting.

**Further, the revised calculation of EVA is largely based on the following assumptions:**

- There is an implicit assumption that accounting depreciation (included in operating profit) is equivalent to economic depreciation (which should be used for EVA calculations). This assumption is doubtful, although there is no information for more accurate calculation.
- For Additional Marketing Expenditure, no estimation of economic life (expected period during which an asset remains useful) in building the brand and corresponding economic depreciation

has been considered in the above calculation.

- No amortisation on the R & D Costs is required to be recognised as the product has not been introduced yet. This is in line with the accounting treatment of such items. There was no Research & Development expenditure in the previous year.

4. (a) To assess the feasibility of joining Paper Tubes market, Michael Porter's 'five forces model' can be used. It analyses the competitive environment of an industry. It is an important tool for understanding the competitive structure of a particular industry. This complete analysis includes five forces: buyer's bargaining power, supplier's bargaining power, the threat of substitute products, the threat of new entrants and the intra industry competition.

While applying this model to the above case, it can be observed that the low cost of the machine along with the fact that an untrained person will only need two day's training as to be able to operate a machine, will form comparatively low costs of entry to the market. Therefore, WDG may reasonably consider *high threat of new entrants*.

Customer's (buyer) power could be high since customers buy Paper Tubes in bulk along with the fact that there is insignificant difference between the products of alternative suppliers. Paper Tubes cost approximately 1% - 3% of the total cost of the customer's finished goods also indicates that *customer's power is high*.

The fact that the special paper from which the tubes are made remain in short supply, signals *high threat from suppliers*. Hence, suppliers may raise their prices that would result in reduction of profit.

Five major players with 75% market share, offer product ranges which are similar in size and quality, besides, the market is a slow growing i.e. annual growth of 3% p.a., indicate *high rivalry among competitors*.

*A little real threat from a substitute product* exist since HEG manufactures a narrow range of Plastic Tubes. This threat might go up if the product range of HEG is expanded or the price of Plastic Tubes goes down sharply.

*Major threat from potential new entrants* can be seen, as foreign-based MNCs are planning to joining this market and it seems that these giant corporations might be able to gain economies of scale from automated machines and large production lines with manufacturing flexibility.

WDG might enter this market due to low capital investment but this would also lead to other potential entrants. The easy entry, threat of substitute, the existence of established competitors in the market, the possible entry of a MNCs, and competitors struggling due to slow growth market are putting the potential of WDG into the question to achieve any sort of competitive advantage.

Joining this market might be a good move, if WDG would be able manufacture Paper Tubes at lowest cost within the industry. To assess feasibility, WDG must take into consideration *all possible synergies* between its existing operations of Card Boxes and the proposed operations of Paper Tubes.

From the available information, joining the market for Paper Tubes does not seem to be attractive. Thus, WDG should go for other alternative performance improvement strategy.

- (b) (i) The reported income from operations does not accurately measure performance because the service department charges are based on revenue. Revenue is not associated with the profit centre manager's use of the service department services. For example, the Reservations Department serves only the Passenger Division and number of reservation requested by Cargo Division is NIL. Thus, by charging this cost based on revenue, these costs are incorrectly charged to the Cargo Division. Further, the Passenger Division requires

additional personnel. Since these personnel must be trained, the training costs assigned to the Passenger Division should be greater than the Cargo Division.

(ii)

**XYZ Airlines**

**Divisional Income Statement  
For the Year Ended March 31, 2018**

Particulars	Cargo Division (Rs.)	Passenger Division (Rs.)	Total (Rs.)
Revenue	42,00,000	42,00,000	84,00,000
Less: Operating Expenses (excluding service department charges)	36,00,000	28,50,000	64,50,000
Gross Margin	6,00,000	13,50,000	19,50,000
Less: Service Department Charges			
Training	1,28,000 $\left(\frac{200}{1,000} \times ₹6,40,000\right)$	5,12,000 $\left(\frac{800}{1,000} \times ₹6,40,000\right)$	6,40,000
Flight Scheduling	1,75,000 $\left(\frac{350}{600} \times ₹3,00,000\right)$	1,25,000 $\left(\frac{250}{600} \times ₹3,00,000\right)$	3,00,000
Reservation	NIL	2,10,000 $\left(\frac{7,000}{7,000} \times ₹2,10,000\right)$	2,10,000
<b>Operating Income</b>	<b>2,97,000</b>	<b>5,03,000</b>	<b>8,00,000</b>

5. (a) Workings

**Statement Showing "Contribution / Machine Hour"**

	'Bottle'	'Toy'
Demand (units)	3,00,000	40,000
Sales (Rs./u)	0.80	30.00
Less: Variable Cost (Rs./u)	0.32	24.00
Less: Specific Fixed Cost (Rs./u)	---	2.50
Contribution (Rs./u)	0.48	3.50
Machine Hours Required per unit	0.025	0.0625
Contribution / Machine Hour	19.20	56.00

**Advice on Supply of 3,00,000/ 4,00,000 Bottles**

- (i) BNZ Ltd. can accept plastic molded toy's order as sufficient number of hrs. i.e. 2,500 hrs. (10,000 hrs. - 3,00,000 bottles × 0.025 hrs.) are available and would be able to generate additional benefit of Rs.3.50 per unit on 40,000 units of toys i.e. Rs.1,40,000.
- (ii) If the order for the supply of bottles increases to 4,00,000 bottles, then 2,500 more hrs. will be required to produce the additional bottles. BNZ Ltd. has to decide whether to utilize 2,500 hrs. for existing bottle order 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 more in case of toys (refer workings). Therefore, BNZ

Ltd. should utilize the remaining 2,500 hours for manufacturing toys rather than to fulfil the order for supply of additional bottles.

Prioritizing production based on contribution per machine hour would maximize profits. *However, existing order fulfilment is necessary for building long term and sustainable customer relationship.* Developing and maintaining long term and intimate relationships with the profitable customers provides valuable benefits to the company as the relationships between company and customers grow, a customer who is satisfied with the company's products and services, tends to commit the relationship, and buy more over time. *Cost of keeping the existing customers is less expensive than the cost of acquiring new customers.*

Hence, BNZ Ltd. should be taken into consideration long term supplier relation before accepting the toy order based on financial consideration as contribution per hour is more in case of toys. Further, company may also explore outsourcing opportunities for production of toys.

- (iii) Minimum number of toys needed to be manufactured to justify the increase in fixed cost of Rs.1,00,000 to make the mould is 25,000 toys {1,00,000/ (Rs.28 - Rs.24)}. Thus, as long as company has excess capacity available to manufacture more than 25,000 toys it is cheaper to produce than to buy from subcontractor.

$$\text{Minimum Expected Excess Capacity hours to justify} = \left( \frac{25,000 \text{ toys}}{16 \text{ toys}} \right) = 1,562.5 \text{ or } 1,563 \text{ hrs.}$$

- (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.

## 6. (a) Analysis of Cost plus Pricing Approach

The company has a plan to produce 2,00,000 units and it proposed to adopt **Cost plus Pricing** approach with a markup of 25% on full budgeted cost. To achieve this pricing policy, the company has to sell its product at the price calculated below:

Qty.	2,00,000 units
Variable Cost (2,00,000 units × Rs. 32)	64,00,000
Add: Fixed Cost	16,00,000
Total Budgeted Cost	80,00,000
Add: Profit (25% of Rs. 80,00,000)	20,00,000
Revenue (need to earn)	1,00,00,000
Selling Price <i>per unit</i> $\left( \frac{\text{Rs. 1,00,00,000}}{2,00,000 \text{ units}} \right)$	50 p.u.

However, at selling price Rs. 50 per unit, the company can sell 1,40,000 units only, which is 60,000 units less than the budgeted production units.

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

#### Statement Showing "Profit at Different Demand & Price Levels"

	I	II	III	IV	Budgeted
Qty. (units)	1,68,000	1,52,000	1,40,000	1,28,000	1,08,000
	Rs.	Rs.	Rs.	Rs.	Rs.
Sales	73,92,000	72,96,000	70,00,000	71,68,000	64,80,000
Less: Variable Cost	53,76,000	48,64,000	44,80,000	40,96,000	34,56,000
Total Contribution	20,16,000	24,32,000	25,20,000	30,72,000	30,24,000
Less: Fixed Cost	16,00,000	16,00,000	16,00,000	16,00,000	16,00,000
Profit (Rs.)	4,16,000	8,32,000	9,20,000	<b>14,72,000</b>	14,24,000
Profit (% on total cost)	5.96	12.87	15.13	<b>25.84%</b>	28.16%

#### Determination of the Best Course of Action

- (i) Taking the above calculation and analysis into account, the company should produce and sell 1,28,000 units at Rs. 56. At this price company will not only be able to achieve its desired mark up of 25% on the total cost but can earn maximum contribution as compared to other even higher selling price.
- (ii) If the company wants to uphold its proposed pricing approach with the budgeted quantity, it should try to reduce its variable cost per unit for example by asking its supplier to provide a quantity discount on the materials purchased.

#### (b) (i) Traditional Variances

$$\begin{aligned}
 \text{Usage Variance} &= (2,500 \text{ Kg} - 2,700 \text{ Kg}) \times \text{Rs. 1.50} \\
 &= \text{Rs. 300 (A)} \\
 \text{Price Variance} &= (\text{Rs. 1.50} - \text{Rs. 2.40}) \times 2,700 \text{ Kg} \\
 &= \text{Rs. 2,430 (A)} \\
 \text{Total Variance} &= \text{Rs. 300 (A)} + \text{Rs. 2,430 (A)} \\
 &= \text{Rs. 2,730 (A)}
 \end{aligned}$$

(ii) **Operational Variances**

$$\begin{aligned}\text{Usage Variance} &= (2,500 \text{ Kg} - 2,700 \text{ Kg}) \times \text{Rs.}2.25 \\ &= \text{Rs.}450 \text{ (A)} \\ \text{Price Variance} &= (\text{Rs.}2.25 - \text{Rs.}2.40) \times 2,700 \text{ Kg} \\ &= \text{Rs.}405 \text{ (A)} \\ \text{Total Variance} &= \text{Rs.}450 \text{ (A)} + \text{Rs.}405 \text{ (A)} \\ &= \text{Rs.}855 \text{ (A)}\end{aligned}$$

**Planning Variances**

$$\begin{aligned}\text{Controllable Variance} &= (\text{Rs.}2.00 - \text{Rs.}2.25) \times 2,500 \text{ Kg} \\ &= 625 \text{ (A)} \\ \text{Uncontrollable Variance} &= (\text{Rs.}1.50 - \text{Rs.}2.00) \times 2,500 \text{ Kg} \\ &= 1,250 \text{ (A)} \\ \text{Total Variance} &= \text{Rs.}625 \text{ (A)} + \text{Rs.}1,250 \text{ (A)} \\ &= \text{Rs.}1,875 \text{ (A)} \\ \text{Reconciliation} &= \text{Rs.}855 \text{ (A)} + \text{Rs.}1,875 \text{ (A)} \\ &= \text{Rs.}2,730 \text{ (A)}\end{aligned}$$



A Planning Variance simply compares a revised standard to the original standard. An Operational Variance simply compares the actual results against the revised amount. Controllable Variances are those variances which arises due to inefficiency of a cost centre/department. Uncontrollable Variances are those variances which arises due to factors beyond the control of the management or concerned department of the organization.

Planning variances are generally *not controllable*. Where a revision of standards is required due to environmental/ technological changes that were not anticipated at the time the budget was prepared, the planning variances are truly *uncontrollable*. However, standards that failed to anticipate known market trends when they were set will reflect faulty standard-setting: it could be argued that these variances were *controllable* at the planning stage.