



# CA Test Series.org (Since 2015)

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Answer Paper	
SCMPE	Duration: 180
Details: Full Test 1	Marks: 100

## **Instructions:**

- All the questions are compulsory
- Properly mention test number and page number on your answer sheet, Try to upload sheets in arranged manner.
- In case of multiple choice questions, mention option number only Working notes are compulsory wherever required in support of your solution
- Do not copy any solution from any material. Attempt as much as you know to fairly judge your performance.

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**ANS-1****(a) Product Wise Profitability as per Original Allocation Methodology**

(Figures in Rs. per unit of leather produced)

Particulars	Product A	Product B	Total
Selling Price	620	420	1,040
Direct Material (Refer Table 1)	286	174	460
Direct Labour (Refer Table 1)	186	114	300
Overheads (allocated equally)	115	115	230
Total Expenses	587	403	990
Profit	33	17	50
Profitability (%)	5.32%	4.05%	×

**Workings****Table 1 Cost Allocation to the Products**

(Figures in Rs. per unit of leather produced)

Particulars	Tanning			Dyeing			Finishing			Total		
	A	B	Total	A	B	Total	A	B	Total	A	B	Grand Total
Direct Material	98	42	140	90	90	180	98	42	140	286	174	460
Direct Labour	63	27	90	60	60	120	63	27	90	186	114	300

**(b) Product wise profitability based on activity based costing using environment driven costs** requires the following steps:

- Breakdown of overhead cost of Rs. 230 per unit into treatment cost of harmful gases, wastewater treatment cost, cost of planting trees and other overhead costs. Refer Table 2 for the breakup.
- Treatment cost of harmful gases, wastewater treatment cost needs to be individually allocated to various processes based on relevant cost drivers. Refer Table 3 for cost allocation to process.
- The overheads mentioned in point 2 thus allocated to the various processes, will be further allocated to products based on the specific ratios given in the problem. Refer Table 4 for cost allocation to products.

**Product Wise Profitability Statement based on ABC using environment driven costs**  
(Figures in Rs. per unit of leather produced)

Particulars	Product A	Product B	Total
Selling Price	620	420	1,040
Direct Material (Refer Table 1)	286	174	460
Direct Labour (Refer Table 1)	186	114	300
Allocation of Overheads			
Treatment Cost of Harmful Gases (Refer Table 4)	50	30	80
Wastewater Treatment Cost (Refer Table 4)	62	38	100
Cost of Planting Trees (shared equally)	10	10	20

Other Overhead Cost (shared equally)	15	15	30
Total Expenses	609	381	990
Profit	11	39	50
Profitability %	1.77%	9.29%	×

### Workings

**Table 2: Breakdown of General Overheads per unit**

Overhead	Amount (Rs.)	Allocation basis between products
Treatment Cost of Harmful Gases	80	Emission of Harmful Gases(cc per week)
Wastewater Treatment Cost	100	Wastewater Generated(litres per week)
Cost of Planting Trees	20	Equally between Products A and B
Other Overheads (balancing figure)	30	Equally between Products A and B
Total General Overheads per unit	230	

**Table 3: Allocation of Treatment Cost to various process**

### Process Wise Information

Overhead	Amount (Rs)	Allocation Basis Between Products	Tanning	Dyeing	Finishing	Total
Treatment Cost of Harmful Gases	80	Emission of Harmful Gases(cc per week)	400cc	300cc	100cc	800cc

Wastewater Treatment Cost	100	Waste water Generated (ltr. per week)	900lt.	600lt.	---	1,500lt.
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#### Cost Allocation to Process

Overhead	Amount (Rs)	Allocation Basis Between Products	Tanning (Rs)	Dyeing (Rs)	Finishing (Rs)	Total (Rs)
Treatment Cost of Harmful Gases	80	Emission of Harmful Gases(cc per week)	40	30	10	80
Wastewater Treatment Cost	100	Waste water Generated (litres per week)	60	40	0	100

**Table 4: Allocation of Treatment Cost to Product A and B(Rs.)**

Overhead	Tanning	Dyeing	Finishing	Total
<b>Treatment Cost of Harmful Gases</b>	Rs.40	Rs.30	Rs.10	Rs.80
Cost Allocation % to Product A	70%	50%	70%	×
Cost Allocation % to Product B	30%	50%	30%	×
Cost Allocation to Product A	Rs.28	Rs.15	Rs.7	Rs.50
Cost Allocation to Product B	Rs.12	Rs.15	Rs.3	Rs.30
<b>Wastewater Treatment Cost</b>	Rs.60	Rs.40	---	Rs.100

Cost Allocation % to Product A	70%	50%	70%	×
Cost Allocation % to Product B	30%	50%	30%	×
Cost Allocation to Product A	Rs.42	Rs.20	---	Rs.62
Cost Allocation to Product B	Rs.18	Rs.20	---	Rs.38

### **(c) Analysis of the difference in product profitability as per both the methods**

In the first method, general overhead costs are allocated to the products A and B, irrespective of the environment costs that each product incurs. General overhead costs are to each product equally. The resultant product profitability shows that Product A yields 5.32% and Product B yields 4.05% profitability. Therefore, the Excel Ltd. would conclude that Product A is more profitable.

In the next method, general overhead costs are bifurcated to identify “hidden” environment costs that are incurred on account of manufacturing these products. Environment costs are first traced to the process that generates harmful gases and wastewater, for which treatment is done. It can be seen that Tanning process, followed by Dyeing and Finishing process generates the maximum amount of waste. Therefore, by proportioning the cost based on the waste generated, more cost is allocated to Tanning the process. Similarly,

Dyeing and Finishing are allocated lesser cost since they do not generate as much waste. It is further given that 70% of the cost of Tanning relates to Product A. This is much higher than the 50% that was allocated to the Product as per the first method. Accordingly, the revised workings show that Product A yields 1.77% and Product B yields 9.29% profitability. The reason being, Product A generates more environment driven costs as compared to Product B.

Excel Ltd. would therefore increase the selling price of Product A if it wants to maintain profitability as per the original method. However, the more sustainable approach would be find out ways of reducing wastewater and harmful gases the manufacturing process



produces. This would in turn result in reduction of environment driven costs such as waste water treatment and treatment of harmful gases. This would sustain profits in the long run.

#### **(d) Four Techniques for the identification and allocation of Environmental Costs**

##### **Input-Output Analysis:**

This technique monitors the material input with the output that is produced. For example, if 100kg of material have been bought and input in the process resulting in 80kg output material, the 20kg must be accounted in some way. Some part of this may say 10% (2kgs) may have been sold as scrap while the remaining 90% (18kgs) of it may be waste. Possibly scrap can be reused therefore may have neutral environment impact. The company can then concentrate on minimizing waste generation.

##### **Flow Cost Accounting:**

This technique uses not only material flows but also the organizational structure. Classic material flows are recorded as well as material losses incurred at various stages of production. Flow cost accounting makes material flows transparent. It tracks:

- (i) Quantities (physical data);
- (ii) Costs (monetary data) and
- (iii) Values = (quantities × costs).

Material flows are divided into three categories: material, system, and delivery/disposal.

- (i) The material values and costs apply to the materials which are involved in the various processes.
- (ii) The system values and costs are the in-house handling costs, which are incurred inside the company for the purpose of maintaining and supporting material throughout. Example: personnel costs or depreciation.

(iii) The delivery and disposal values and costs refer to the costs of flows leaving the company for example transport costs or cost of disposing waste.

The focus of flow cost accounting is on reducing the quantities of materials, which leads to increased ecological efficiency.

### **Life Cycle Costing:**

This technique considers the costs and revenues of a product over its whole life rather than one accounting period. Therefore, the full environmental cost of producing a product will be taken into account. In order to reduce lifecycle costs, an organization may adopt a TQM approach. Good environmental management is increasingly recognized as an essential component of TQM. Such organizations pursue objectives that may include zero complaints, zero spills, zero pollution, zero waste and zero accidents. Information systems need to be able to support such environmental objectives via provision of feedback of the organizational efforts in achieving such objectives.

### **Activity Based Costing (ABC):**

ABC allocates internal costs to cost centres and cost drivers on the basis of the activities that give rise to the costs. Environment-related costs can be attributed to joint cost centres and environment-driven costs are hidden on general overheads. Environment-driven costs are removed from general overheads and traced to products or services. The cost drivers are determined on environment impact that activities have and costs are charged accordingly. This should give a good attribution of environmental costs to individual products that should result in better control of costs.

### **(e) Reasons why environmental costs is becoming important in organizations**

(i) **“Carbon footprint”** measures the total greenhouse gas emissions caused directly and indirectly by a person, organization, event or product. People are now becoming aware about the carbon footprint and recycling. Several companies have initiated CSR committees as they feel that portraying themselves as environmentally responsible makes them popular among their consumers.



(ii) Environmental costs are becoming **huge** for some companies particularly those operating in highly industrialized sectors such as oil production. Such significant costs need to be managed.

(iii) **Regulation** is increasing worldwide at a rapid pace, with penalties for non-compliance also increasing accordingly.

### **ANS-2(A)**

The company has a plan to produce 1,80,000 units and it proposed to adopt Cost plus Pricing approach with a mark-up of 25% on full budgeted cost. To achieve this pricing policy, the company has to sell its product at the price calculated below:

Qty.	1,80,000 units
Variable Cost (1,80,000 units x Rs.25)	45,00,000
Add: Fixed Cost	12,60,000
Total Budgeted Cost	57,60,000
Add: Profit (25% of Rs.57,60,000)	14,40,000
Revenue (need to earn)	72,00,000
Selling price per unit $\left( \frac{\text{Rs.72,00,000}}{1,80,000 \text{ units}} \right)$	40 p.u

However, at selling price Rs.40 per unit, the company can sell 1,50,000 units only, which is 30,000 units less than the budgeted production units.

After analysing 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	V	Dealer
Qty. (units)	1,74,000	1,62,000	1,50,000	1,38,000	1,25,000	1,80,000
Capacity utilised as a% of total	96.67%	90.00%	83.33%	76.67%	69.44%	100%
Selling Price p.u. (Rs.)	36	38	40	42	44	32
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Sales	62,64,000	61,56,000	60,00,000	57,96,000	55,00,000	57,60,000
Less: Variable Cost	43,50,000	40,50,000	37,50,000	34,50,000	31,25,000	41,40,000
Total Contribution	19,14,000	21,06,000	22,50,000	23,46,000	23,75,000	16,20,000
Less: Fixed Cost	12,60,000	12,60,000	12,60,000	12,60,000	12,60,000	12,60,000
Profit (Rs.)	6,54,000	8,46,000	9,90,000	10,86,000	11,15,000	3,60,000
Profit (% on total cost)	11.66%	15.93%	19.76%	23.06%	25.43%	6.67%

### Advice

(i) Taking the above calculation and analysis into account, the company should produce and sell 1,25,000 units (i.e. near to 70% of budgeted production) at Rs.44. At this price RK 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) Sell to wholesale dealer is not a financially viable option. RK will get only 6.67% margin on cost which is substantially lower than the desired level of mark up. However, this option will utilize the entire production. Instead RK may explore other opportunities to utilize additional capacity i.e.30%, for example, international expansion through e-commerce website or outsource the unutilized capacity to others to earn additional revenue.

(b)

(i) Statement showing 'Total Quality Costs'

Particulars of costs	Rs.	%	%	%
Prevention Costs				
Supplier Review	1,25,000	2.16%	2.16%	
Appraisal Costs				
Equipment Testing (Rs.18 × 1,600 hrs.)	28,800	0.50%	0.50%	2.66%
Internal Failure Costs				
Down Time	7,70,000	13.33%		
Manufacturing Rework (Rs.228 x 3,200 bikes)	7,29,600	12.62%	25.95%	
External Failure Costs				
Customer Complaints (Rs.35 x 2,000 hrs.)	70,000	1.21%		
Warranty Repair (Rs.1,560 x 2,600 bikes)	40,56,000	70.018%	71.39%	97.34%
Total Quality Costs	57,79,400	100.00%	100.00%	100.00%

(ii) The reporting of quality costs highlights the cost of quality activities at H. The total quality costs statement clearly displays the relationship between conformance costs (prevention and appraisal costs) and non-conformance costs (internal failure and external failure costs) and the drivers of a reduction in the overall spending on quality. Statement indicates that only 2.16% of the total quality cost is the cost of preventing quality problems while 0.50% is the cost of appraisal activities. Thus, prevention and appraisal costs make up only 2.66% of total quality costs. In contrast, 97.34% of quality control costs are incurred for internal and external failure costs. Following two measures can be used to reduce non-conformance cost:

Total Productive Maintenance (TPM) is a system of maintaining and improving the integrity of production and quality system through keeping all equipment in top working condition so as to avoid breakdowns and delays in manufacturing processes. It involves identifying machines in every division (including planning, manufacturing, maintenance) and then planning & executing a maintenance programme covering their entire useful life.

In this scenario, TPM will help in reducing internal failure cost (i.e. downtime and manufacturing rework cost), which constitutes 25.95% of total quality cost, by keeping all equipment in good working conditions so that there is no downtime or machine breakdown and ensuring that all equipment run smoothly. If machines work properly, the chances of rework will reduce; ultimately will also reduce chances of warranty repair and customer complaints (comprising 71.39% of total quality cost which is the major part of total quality cost).

Total Quality Management (TQM) aims at improving the quality of organisational output including goods and services, through continual improvement of internal practices. Its objective is to eradicate waste and increase efficiency without compromising with the quality. It requires that company maintain these quality standards in all aspects of business by ensuring that things are done right the first time so that defects and waste are eliminated from operation.

It appears that H is not a TQM company at present due to huge disparity between conformance costs and non-conformance costs. In order to make H to be successful, all staff at H must be engaged in the improvement process and share in the continuous improvement ethos. In order to establish a reputation as a high- quality bike manufacturer H must ensure staff are focused on quality and attitudes changed toward the importance of conformance activities, for instance, H can conduct third party inspection of raw material at supplier's workplace leading to maintenances of quality standards.

Overall, while applying above two measures, in the H, consideration must therefore be given to the optimum balance between the costs or conformance and the costs of non-conformance

**(c) Option I**

Units Produced	1000	
Less: Defective (4%)	40	
Unit Sold	960	
Sales (960@ 800)		768000
Less: Variable cost of Production (1000 @ 500 )	500000	
Less: Inspection of finished goods		10000
Spare part replacement cost (40 defective units @ 2000 per 20 defective)		4000
Profit	254000	

**Option II**

Units Produced	1000	1000
Less: Warranty Replacement (1% of unit sold)	10	9.91
Unit Sold	1000	990.09
Sales (990.09 @800)		792000
Less: Variable cost of Production		
Units sold (990.09@ 500)	495045	
Warranty Replacement (9.91 @ 500)	4955	500000
Less: Machine setup cost		8000
Profit		284072

Hence option II is more beneficial from financial perspective.

(d)

		Cutting	Finishing
Capacity (units)		10,000	5,000
Selling Price	1000		
Material Cost	400		
Throughput contribution Rs./u.	600		
(i) Throughout	600		
Subcontracting changes	400		



	200		
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Increase in throughout contribution-  $200 \times 5000 = 10,00,000$

(ii) Already cutting has surplus capacity. It is not a bottleneck. Do not outsource as there will be no benefit, instead there will be reduction of or throughout contribution of outsourced.

(iii) Cutting has surplus capacity Do not increase non-bottleneck capacity.

### **ANS-3(a)**

#### **From the group's perspective**

For every motor sold externally, Division M generates a profit of Rs.80 (Rs.850- Rs.770) for the group as a whole. For every motor which Division S has to buy from outside of the group, there is an Incremental cost of Rs.60 per unit (Rs.800- [Rs.770-Rs.30]). Therefore, from a group perspective, as many external sales should be made as possible before any internal sales are made. Consequently, the group's current policy will need to be changed. This does, however, assume that the quality of the motors bought from outside the group is the same as the quality of the motors made by Division M.

Division M's total capacity is 60,000 units. Given that it can make external sales of 30,000 units, it can only supply 30,000 of Division S's demand for 35,000 motors. These 30,000 units should be bought from Division M since, from a group perspective, the cost of supplying these internally is Rs.60 per unit cheaper than buying externally. The remaining 5,000 motors required by Division S should then be bought in from the external supplier at Rs.800 per unit.

In order to work out the transfer price which should be set for the internal sales of 30,000 motors, the perspective of both divisions must be considered.

#### **From Division M's perspective**

Division M's only buyer for these 30,000 motors is Division S, so the lowest price it would be prepared to charge is the marginal cost of making these units, which is Rs.740 per unit. However, it would ideally want to make some profit on these motors too and would consequently expect a significantly higher price than this.

#### **From Division S's perspective**

Division S knows that it can buy as many external motors as it needs from outside the group at a price of Rs.800 per unit. Therefore, this will be the maximum price which it is prepared to pay.

#### **Overall**

Therefore, the transfer price should be set somewhere between Rs.740 and Rs.800. From the perspective of the group, the total group profit will be the same irrespective of where in this range the transfer price is set. However, it is important that divisional managers and staff remain motivated. Given the external sales price which Division M can achieve and the fact that Division S would have to pay Rs.800 for each motor bought from outside the group, the transfer price should probably be at the higher end of the range.

(b)

#### **Analysis of Cost and profit:**

	<b>Rs.(lakhs)</b>	<b>Rs.(lakhs)</b>
Direct material	3.60	
Direct labour	6.40	
Prime cost		10.00
Overhead:		
Variable factory overhead	2.20	

Fixed factory overhead	2.60	
Administration overheads	1.80	
Selling commission	1.00	
Fixed selling overheads	0.40	8.00
Total cost		18.00
Profit		2.00
Rate of profit on costs (2/18) - 1/9		

Overhead absorption rate based on direct wages =  $(8.00 / 6.40) \times 100 = 125\%$  of direct wages

Break up of new order:	Rs.
Direct Materials	36,000
Direct Labour	64,000
Overheads 125% of direct wages	80,000
Total costs	1,80,000
Profit 1/9	20,000
Selling Price	2,00,000

The following points emerge

(i) Factory overheads only are to be recovered on the basis of direct wages.

(ii) The special order is a direct order. Hence commission is not payable.

(iii) The budgeted sales are achieved. Hence all fixed overheads are recovered. Hence, no fixed overheads will be chargeable to the special order.

Based on the above, the factory variable overheads recovery rate may be calculated as under:

Total variable factory overheads Rs.2.20 lakhs

Direct wages Rs.6.40 lakhs

Factory overhead rate =  $(2.20 / 6.40) \times 100 = 34.375\%$

Applying this rate, the cost of the special order will be as under

	Rs.
Direct materials	36,000
Direct labour	64,000
Overheads 34.375% of direct wages	22,000
Total costs	1,22,000
Price offered	1,50,000
Margin	28,000 (more than 1/9)

Hence, the order is acceptable at the price of Rs. 1, 50,000.

(c)

**(a) (i) Selling Price for "Comfort" that would maximize its contribution at Maturity Stage**

Contribution per unit of "Comfort" = Selling Price per unit - Variable Cost per unit

Total Contribution = Contribution per unit x Units sold

**All figures in Rupees**

Sales (units) per week	550	725	1,000	1,150	1,200
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Selling Price per unit	1,750	1,600	1,525	1,450	1,300
Less: Variable Cost per unit	750	750	750	750	750
Contribution per unit	1,000	850	775	700	550
Total Contribution	5,50,000	6,16,250	7,75,000	8,05,000	6,60,000

Total contribution is maximum when sales are 1,150 units. Therefore, the selling price per unit of "Comfort" should be Rs. 1,450 per unit

## **(ii) Production Number of "Sports" and Selling Price per unit**

Amber Ltd. has a production capacity of 3,500 hours per week. As explained in (i) above, it would manufacture 1,150 units of "Comfort" per week. Each unit of "Comfort" requires 2 hours of production. Therefore, total production hours for Comfort would be 1,150 units x 2 hours 2,300 hours per week

Production capacity remaining to manufacture "Sports" 3,500 hours-2,300 hours = 1,200 hours per week each unit of "Sports" requires 2.5 hours of production

Therefore, the number of "Sports" units that can be produced =1,200 hours/2.5 hours= 480 units per week

Linear relationship between Selling Price and Number of Units Demanded has been given to be  $P = a - bx$

$P$  = Selling Price per unit

$a$  = Selling Price when demand will be zero

$b$  (slope) = Change in Price/Change in Quantity

$x$  = Quantity Demanded

Given, at a Selling Price of Rs.1, 000 per unit, Quantity demanded will be 1,000 units per week. For every Rs.100, per unit increase / decrease in Selling Price, the Quantity demanded

will decrease / increase by 200 units per week respectively. ARs.500 per unit increase in Selling Price will result in fall of 1,000 units of Sales per week. The Selling Price at which Sales will be Zero i.e.  $a=Rs.1,500$  per unit.

$b(\text{slope}) = \text{Change in Price} / \text{Change in Quantity} = Rs.100/200 = 0.50$

Penetration pricing is most commonly associated with a marketing objective of increasing market share or sales volume, rather than short term profit maximization

Thus, substituting the values in the equation to find the Selling Price of "Sports" when the Quantity Sold is 480 units

$$P = a - bx$$

$$= 1,500 - 0.50 \times (480)$$

$$= 1,500 - 240$$

$$= Rs.1,260$$

Sports should be sold at Rs.1,260 per unit during the growth stage

(b) Ethnic" is given to be a highly innovative product that is about to be launched into the market. The product with unique features that will differentiate it from other products leading to a revolutionary impact on market and customer behaviour. There seem to be no competitors providing similar products

**Skimming Price Strategy** is adopted to charge high prices in the introduction stage in order to recover costs. Skimming Price will be suitable for "Ethnic" because:

- Market for the product is not yet established. Initially high promotional expense may have to be incurred to create customer awareness and build a market for the product.
- Due to its innovative feature, the customers would not mind paying a premium for the unique product offering. Demand would be inelastic
- The market demand is unknown. Initial capital outlay to produce this product may be high, resulting in high cost of production.



- Production and promotional costs in the initial years is likely to be high. Therefore a higher selling price would help Amber Ltd. to recover the costs. Since demand is likely to be inelastic, charging a premium may not be a problem.
- The price can be gradually reduced once the market for the product is established.
- Competitors may reverse engineer and offer similar products, due to which price may have to be lowered in the long run to retain customers.

Penetration Pricing is adopted to charge a low price in the initial stage for penetrating the market as quickly as possible. For a new product, this low price strategy will popularize the product. Once the market is established, the price may be increased. Penetration pricing will be suitable when

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

Product "Ethnic" is an innovative product that the manufacturer believes will change the whole market once it is launched. A strategy of penetration pricing could be effective in discouraging potential new entrants to the market. However, the product is believed to be unique and as such demand is likely to be fairly inelastic. In this instance a policy of penetration pricing could significantly reduce revenue without a corresponding increase in sales. Thus, this strategy is not suitable for "Ethnic".

### **(c) Impact on Unit Selling Price and Average Cost of Production per unit at each stage of "Ethnic" Product Lifecycle**

#### **Introduction Stage**

As explained in (b) above, at the Introduction Stage of Lifecycle, due to high cost of production and initial promotion expenditure, the unit cost of production will be high. Using Skimming Price Policy, the unit selling price will also be high.

## **Growth Stage**

This is the second phase of the Life Cycle, product awareness among customers would result in increased demand. Therefore, scale of production likely to increase. The new market segment would attract competitors, who are like to reverse engineer and offer similar products in the market. Promotional activities and marketing activities need to continue to maintain and gain market share.

Accordingly, the unit selling price would reduce from the introduction stage on account of the following reasons

- Competitors offering similar product would take away the uniqueness feature of “Ethnic”
- Again, to gain market share the unit selling price may have to be lowered to make it attractive to a larger segment of customers

The unit cost of production is also likely to reduce due to the following reason:

- Increased production would result in increased material procurement from supplies. Bulk purchasing discounts can be negotiated with them to lower cost of production
- Learning curve and experience would enable the labor force to become more efficient. This leads to higher production with the same level of resources leading to cost savings.
- Larger production batches due to increase in scale of operations will reduce the unit variable overhead cost
- Economies of scale would result due to fixed overhead cost being spread over larger number of units.

## **Maturity Stage**

The third phase of Product Life-Cycle that is characterized by an established market for “Ethnic” After rapid growth in sale volume in the previous stages growth of sales for the product will saturate. Competition would be high due to large number of rivals in the market this may lead to decreasing market share.

It is likely that the price of the product will be lowered further at the maturity stage in a bid to preserve sales volumes. The company may attempt to preserve sales volumes by employing an extension strategy rather than reducing the selling price. For example, they may introduce product add-ons to the market that are compatible with “Ethnic”.

#### **Unit production cost will remain constant**

- Direct material cost will remain constant. If procurement is lower than the growth phase, it might even lead to slightly higher prices since supplier may not extend bulk discounts.
- The benefits of efficient production due to the effect of learning and experience may also have waned. Therefore, unit labour cost is also likely to remain constant.
- Since scale of production is no longer increasing the unit variable overhead costs are also likely to remain constant.

#### **Decline Stage**

This last stage in the product cycle is characterized by saturated market, declining sales change in customer's tastes etc. Probability may slowly start decreasing with fall in sales.

At the decline stage, Product “Ethnic” is likely to have been surpassed by more advanced products in the market and consequently will become obsolete. The company will not want to incur inventory holding costs for an obsolete product and is likely to sell “ethnic” at marginal cost or perhaps lower.

Sales volumes at the decline stage are likely to be low as the product is surpassed by new exciting products that have been introduced to the market. Furthermore, the workforce may be less interested in manufacturing a declining product and may be looking to learn new skills. For both of these reasons, unit production costs are likely to increase at the decline stage.

**(d)**

Particulars	Division A	Division B
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Selling Price/ Transfer Price	20	30
<b>Less: Variable Cost</b>	10	16
<b>Less: Transfer Price</b>	-	20
Contribution P.u.,	10	(6)

**Total contribution of company = 10 – 6 = Rs. 4**

**A.** since Division B is suffering from contribution loss of Rs. 6 P.u., it will not accept the offer of new client

**B. (i)** Since division A has surplus capacity both Division A & Company are not earning anything on surplus Capacity, although if Division B accept the offer, Company as whole will earn Rs. 4 P.u. hence decision of Division B of not accepting the offer is not correct from company point of view.

**(ii)** Since Division A & company are earning a contribution of Rs. 10 P.u on intermediate goods & Company is going to suffer a loss of Rs. 6 P.u on accepting the offer by Division B, hence decision of Division B is correct from Company point of view.

**ANS-4(A)**

**(i) Key changes to support the adoption of 'Kaizen Costing Concept'**

Kaizen Costing implies that small, incremental changes routinely applied and sustained over a long period results in significant improvements. It aims to involve workers from multiple functions/ levels in the organization to work together to address problem or improve a particular process. In other word, it is costing techniques to reflect continuous efforts to reduce product cost, improve product quality or improve the production process after manufacturing activities have begun.

Adopting Kaizen costing requires a change in the method of setting standard. Kaizen Costing focuses on “cost reduction” rather than “cost control”. It emphasizes on small but Continuous improvement. Targets are updated continuously to reflect the improvement that has already been achieved and that are yet to be achieved.

The Suggestive changes which are required to adopt Kaizen Costing concepts in A – One are as follows:

**Cost Control System to Cost Reduction System:** Traditionally Standard Costing system assumes stability in the current manufacturing process and standards are set keeping the normal manufacturing process into account thus the whole effort is on to meet performance cost standard. On the other hand Kaizen Costing believes in continuous improvements in manufacturing processes and hence, the goal is to achieve cost reduction target. The first change required is the standard setting methodology i.e., from earlier Cost Control System to Cost Reduction System.

**Reduction in the Periodicity of Setting Standards:** Under the existing control system followed by the A-One, standards are set semi-annually and based on these standards monthly variance reports are generated for analysis. But under Kaizen Costing system cost reduction targets are set for small periods say for a week or a month. So, the period covered under a standard should be reduced from semi-annually to monthly and the current practice of generating variance reports should be reduced to a month or a week.

**Participation of Executives or Workers in Standard Setting:** Under the Kaizen Costing system, participation of workers or executives who are actually involved in the manufacturing process are highly appreciated while setting standards. So, the current system of setting budgets and standards by the finance department should be changed.

## **(ii) Impact of implementation of the Kaizen costing approach on the employee management**

- **Role of Employees** - The relation between management and employees. Apart from role of employees will change drastically, because under any system of costing

employees are seen as cost centre and real cause of problem, but in kaizen costing employees are seen as solution provider.

- **Implementation aspects of Kaizen** - It may be possible that at time of implementation of Kaizen due to change in role of employees, they may be not self – motivated to command, control and suggest possible improvement themselves. But this is sure that after reasonable time Kaizen system will increase staff motivation through empowerment.
- **Changes in Culture**-From government regulated culture to employee self-empowered work – culture, will be dramatic change for A-One. Under Kaizen employee group will be assigned with power to make continuous changes rather than just executing the changes approved from management.

**(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 payoff 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.**

**OR**

**(b)** Feed forward control systems are the comparison of draft plans with the objectives of the company

In the scenario provided the consultancy firm has a number of objectives, two of which are related to their cash flow. The first of these is to pay off the loan by the year end and the second is to have a positive cash reserve of Rs.2, 00,000 by the year end.

An initial draft of the cash budget will be produced based on the expected receipts and payment and other costs of the firm. Cash budgets to be prepared showing the cash inflows and outflows for each month so that the firm can identify its expected monthly cash balance. This can be compared with the company's objectives to see if their cash balance objectives are being achieved. It is this comparison that is the process of feed forward control.

It is also referred to as a preventive control. The rationale behind feed forward control is to foresee potential problems and take corrective action to ensure that the final output is as expected. Feed forward controls are desirable because they allow management to prevent problems rather than having to cure them later. Feed forward controls are costly to implement as it requires additional resources and investments.

Feedback control systems are the comparison of actual results against the budget that has been approved. Thus, in the context of the SW & CO., actual travelling costs comparison made against the budgeted costs and overdue fees receivables are also the process of feedback control.

As with any budget and actual comparison there may be an adverse or favourable variance. If this is significant then further analysis may be required to determine its cause. This comparison process is feedback control. It is also known as post action control. If any problem is identified after a process is complete, a corrective action is taken to rectify the problem. Feedback based system have the advantage of being simple and easy to implement

Thus, initially the difference between feed forward control and feedback control systems is that feed forward occurs in the budget Setting stage whereas feedback control occurs during the year. This means that feed forward identifies potential problems before they occur whereas feedback identifies problems after they have happened.

(c)

**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 Rs. 100.

Departments	Share in Total Variable Cost	Required Contribution as a %	Sales
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	incurred (a)	on Variable Costs (b)	
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 Rs.1,50,000 for the period April to July. ABC Ltd. Is earning a total contribution of Rs.5,00,000 for the aforesaid period on total Sales of Rs.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.

#### **ANS-5(A)**

#### **Reconciliation of Operating Income**

Particular	Amount(Rs.)
Operating income in 2016	10,80,000
Add: Change Due to industry Market Size Factor (W.N.-1)	84,000
Changes Due to Productivity (W.N.-2)	58,000
Changes Due to Product Differentiation (W.N.-3)	2,20,000
Operating Income in 2017	14,42,000

#### **Workings**

Total Increase in Sale of Cardboard Boxes 20,000 Boxes (4,20,000 Boxes-4,00,000 Boxes). Out of this increase in Sales of 20,000 Boxes, 12,000 Boxes (3% of 4,00,000) is due to

growth in market size, and the remaining 8,000 Boxes (20,000 Boxes-12,000 Boxes) are due to an increase in market share.

**W.N.1 Effect of the Industry Market Size Factor on operating income:**

$$= \text{Revenue and Cost Effect of Growth Component in 2017} \\ \times \frac{\text{Increase in Sales Unit Due to Market Growth}}{\text{Total Growth in Sales Unit (From 2016 to 2017)}}$$

$$= \text{Rs.1,40,000} \times \frac{12,000 \text{ Boxes}}{20,000 \text{ Boxes}}$$

$$= 84,000 \text{ (F)}$$

**W.N.2 Effect of Productivity on operating income:**

$$= \text{Cost Effect of Productivity Component in 2017}$$

$$= 58,000 \text{ (F)}$$

**W.N.3 Effect of Product Differentiation on operating income**

Particulars	Amount (Rs.)
Increase in the Selling Price (Revenue Effect of the Price Recovery Component)	4,20,000(F)
Increase in Prices of Inputs (Cost Effect of the Price Recovery Component)	2,56,000(A)
Growth in Market Share Due to Product Differentiation*	
$\left( (\text{Rs. 1,40,000} \times \frac{8,000 \text{ Boxes}}{20,000 \text{ Boxes}}) \right)$	Rs.56,000(F)
<b>Total</b>	<b>2,20,000(F)</b>

\*Revenue and Cost Effect of Growth Component in 2017

$$\times \frac{\text{Increase in Sales Unit Due to Product Differentiation}}{\text{Total Growth in Sales Unit (From 2016 to 2017)}}$$



**(b)**

**(a)** The success factors in the customer perspective will drive improved customer satisfaction. This should improve the customer perception of our service and so drive revenue growth. The increase in revenue could come through two routes:

1. Winning customers from the competition and thus increasing volume or
2. Increased selling prices as we may be perceived to offer a premium service.

Increased selling prices will immediately improve the profit margin of the service.

Increased volumes may indirectly improve our margins as we can spread the increased activity over our existing fixed cost base, for example, by increasing capacity utilisation (having more packages on each lorry).

As these improvements to operating profit occur without additional capital expenditure, they may feed through to an increased return on capital employed.

#### **(b) Ability to meet customers' transport needs**

This is a measure of the flexibility of the business and would be measured by the percentage of customer requests which Victoria can actually undertake:

$$\frac{\text{Total number of packages transported}}{\text{Total number of customer transport requests}} = \frac{5,48,000}{6,10,000} = 89.8\%$$

#### **Ability to deliver packages quickly**

The difficulty of this measure is that different packages may travel different distances and so take longer. Therefore, a measure based on time taken per kilometre which a package travels is appropriate:

$$\frac{\text{Total minutes spent in transit by each package}}{\text{Total package kilometers travelled}} = \frac{13,15,20,000}{6,57,60,000} = 2.0$$

#### **Ability to deliver packages on time**

This is measured by the number of packages delivered within the time window given to the Customer:

$$\frac{\text{Deliveries within window}}{\text{Total number of packages transported}} = \frac{(5,48,000 - 21,920)}{5,48,000} = 96\%$$

### **Ability to deliver packages safely**

This is measured by the number of undamaged packages delivered within the time window given to the customer:

$$\frac{\text{Deliveries of undamaged packages}}{\text{Total number of packages transported}} = \frac{(5,48,000 - 8,220)}{5,48,000} = 98.5\%$$

### **Problems with measurement using customer complaint**

There are two dangers with measuring performance through customer complaints. The first is under-reporting where the customer does not bother to report a problem although it negatively impacts on their perception of Victoria. The customer simply walks away from Victoria's service. This could be alleviated by automatically discounting the invoice of any late delivery as Victoria should be recording its own delivery performance and not only relying on customers to provide data nor delay the process by waiting for their complaint.

The second is reporting of unjustified complaints to obtain compensation payments/credits. As the measures stand, they record all customer complaints whether reasonable or not. This could be addressed by using the number of customer credits issued for the fault rather than the number of complaints.

**(c)** The senior management rewards system appears open to manipulation as the board is effectively setting their own rewards. There is the danger that targets are set to be easily achieved and so the profits of the business are siphoned off to the managers rather than the shareholders. The introduction of the BSC should assist in creating coherence between the objectives of the senior management and those of the shareholders. However, it appears

that the major, financial measures suggested in the BSC do not directly address shareholder wealth although return on capital will be related. Finally, in a market where competition is fierce, the ability of management to grow revenue will be heavily constrained and there appear to be important factors in profit which are outside of the control of senior managers (fuel costs).

The operational managers should have their measures of performance set through a cascade down from the strategic measures in the BSC. These measures will often come from the customer and process perspectives. In this way, the reward system should be consistent with the overall objectives of the business. The suggestion that operational managers should be involved in setting their own targets should be treated carefully as it may present problems. This suggestion often arises from a confusion of the idea of explaining the target setting process to the manager with the idea of actually setting the target. The setting of the target should be done by a higher level of management so that the target is achievable with above normal effort. The target should not be set to be unreachable as this can cause demotivation. The target set should then be explained to the employee involved so that they understand what they have to do in order to earn this additional reward. It would be advisable for operational management, where most improvements are incremental, that the target is one where the bonus increases as the performance improves rather than a simple one of obtaining a given level of performance.

#### **ANS-6(A)**

#### **Scenario 1**

(i) The ideal price would be Rs. 260 per kg to be quoted to the customer. While the customer has asked for a price of Rs.250 per kg. The price of 260 per kg is still beneficial to the Customer as the life of Line 2 product is 1.5 times Line 1 product priced at Rs.180 per kg. 1.5 times 180 is 270 and the customer would benefit even at a price of Rs.270 per kg. But is getting a good bargain at Rs.260 per kg. This has to be explained to the customer to get him accept the price of Rs.260 per kg as against Rs. 250 per kg sought by him.

(ii) At this price while the contribution for Line 2 product drops to about 34% but the overall Profitability at profit level is maintained at 15%. The reason for profitability remaining at 15% despite the drop in contribution to about 34% is because overheads and depreciation increase only incrementally and the accretion to contribution at the price of Rs.260 the new customer is at Rs.56.80 lacs is far higher than the incremental overheads plus depreciation which is Rs.22.20 lacs (Rs.6.20lacs+Rs.16.00lacs) This has to be explained to the management.

(iii) As this is a one-time order, the company would be saddled with Rs.6.20 lacs (predominantly manpower supervision cost) and a loss of contribution of Rs. 4.00 lacs due to sale of Line 2 product at Rs.5 less per kg. in subsequent years too. Also a price once reduced cannot be increased easily. To make up for this, the Sales Head should sell at least 15,000 kg of Line 1 product. This is arrived at by dividing Rs.10.20 Lacs (Rs.6.20 lacs+Rs.4.00 lacs) by contribution per unit of Line 1 product which is Rs.72, 14,167 kg. (10.20 lacs/ 72), rounded off to 15,000 kgs for which capacity is available (50,000 kgs) within the 3rd shift. Depreciation cost for the 2<sup>nd</sup> shift will not be incurred as line 2 will be back to single shift operation after 2019-20.

(iv) The incremental costs are the variable costs plus loss of margin on existing customers plus the incremental overheads and depreciation totalling to Rs.26.20 lacs. If these are recovered then there is no loss. The price to be obtained will be Rs. 221.75. This will be variable cost of Rs.189 per kg plus Rs.32.75 per kg which is Rs.26.20 divided by 80.000 kgs. At this price there is no loss or gain but it is not worth the effort of running the 2nd shift if the customer is a hard negotiator and has alternatives, the price to be accepted for reasons other than profits (for example gaining a big customer where there is a possibility of big orders in future) cannot be less than Rs.221.75.

## **Scenario 2**

With a raw material price increase at Rs. 12 per kg no customer will pay more than Rs.12 per kg as the XEE Ltd will have to justify. Though there is a fall in contribution %, to there is no loss to the company as the price increase in variable casts amounting to Rs.12 per kg is fully recovered.

## Workings

Particulars	Line 1	Line 2	Line 2	Total
		Existing customers	New customers	
Capacity kg.	6,50,000	2,40,000	2,40,000	
Production/ Sales kg	6,00,000	80,000	80,000	
Unit Price/ Costs per kg. in Rs.				
Selling Price	180	310	260	
Variable Cost	(108)	(189)	(189)	
Contribution	72	121	71	
Contribution%	40%	39%	27%	
	Rs. in Lacs	Rs. in Lacs	Rs. in Lacs	Rs. in Lacs
Selling Price	1,080.00	248.00	208.00	1,536.00
Variable Cost	(648.00)	(151.20)	(151.20)	(950.40)
Contribution	432.00	96.80	56.80	585.60
Overheads				(246.20)
Depreciation				(109.00)
Profit				230.40
Profit %				15%

The price of Rs. 260 per kg. has been derived as follows:

Assume the price to new customer be "X"

Hence, Sales less Variable costs less Overheads less Depreciation = 15% of Sales

$$(1,080.00 + 248.00 + X \times 0.80) - 950.40 - 246.20 - 109.00 = 15\% \text{ of } (1,080.00 + 248.00 + X \times 0.80)$$

$$\text{Or } 22.40 + 0.80X = 19.20 - 0.12X$$

$$\text{Or } 0.68X = 176.80$$

$$\text{Or } X = 176.80 / 0.68 = 260$$

(b)

### Computation of Variances

#### Material Usage Variance

$$= \text{Standard Price} \times (\text{Standard Quantity} - \text{Actual Quantity})$$

$$= \text{Rs. } 5.00 \times (\text{Rs. } 24,000^* \text{ Kgs} - 30,000 \text{ Kgs})$$

$$= \text{Rs. } 30,000 \text{ (A)}$$

$$* \left( 2,000 \text{ units} \times \frac{30,000 \text{ Kgs}}{2500 \text{ units}} \right)$$

#### Labour Efficiency Variance

$$= \text{Standard Rate} \times (\text{Standard Hours} - \text{Actual Hours})$$

$$= \text{Rs. } 7.00 \times (20,000^* \text{ hrs.} - 22,500 \text{ hrs.})$$

$$= \text{Rs. } 17,500 \text{ (A)}$$

$$* \left( 2,000 \text{ units} \times \frac{25,000 \text{ hrs.}}{2500 \text{ units}} \right)$$



### Variable Overhead Efficiency Variance

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

$$= (20,000 \text{ hrs.} \times \text{Rs. } 3.00) - (\text{Rs. } 3.00 \times 22,500 \text{ hrs.})$$

$$=\text{Rs. } 7,500 \text{ (A)}$$

### Fixed Overhead Volume Variance

=Absorbed Fixed Overheads - Budgeted Fixed Overheads

$$= (20,000 \text{ hrs.} \times \text{Rs. } 3.00) - (25,000 \text{ hrs.} \times \text{Rs. } 30.00)$$

$$=\text{Rs. } 15,000 \text{ (A)}$$

### Sales Margin Volume Variance

=Standard Margin - Budgeted Margin

$$= (2,000 \text{ units} \times \text{Rs. } 60.00) - (2,500 \text{ units} \times \text{Rs. } 60.00)$$

$$=\text{Rs. } 30,000 \text{ (A)}$$

### Sales Contribution Volume Variance

=Standard Contribution-Budgeted Contribution

$$= (2,000 \text{ units} \times \text{Rs. } 90.00) - (2,500 \text{ units} \times \text{Rs. } 90.00)$$

$$=\text{Rs. } 45,000 \text{ (A)}$$

### Statement Showing "Reconciliation between Budgeted Profit & Actual Profit"

Particulars	Conventional Method(Rs.)	Relevant Cost Method(Rs.)	
		Scarce Materiel	Scarce Labour
Budgeted Profit (2,500 units x Rs. 60)	1,50,000	1,50,000	1,50,000

Sales Volume Variance	30000 (A)	NIL*	22,500\$ (A)
Material Usage Variance	30000 (A)	75,000 (A)	30000 (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 Rs.30000 (A) i.e., 6,000 Kg. x Rs.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 6000 Kg. leads to lost contribution of Rs.45000 i.e., 6000 kgs. x Rs.7.5. Total material usage variance based on relevant cost method, when material is scarce will be: Rs.30,000(A) +Rs.45,000(A) =Rs.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., Rs.45,000 (500 units x Rs.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., Rs.45, 000 (A) - Rs.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.

22,500hrs. = 2,500 hrs. Contribution lost per hour = Rs.9. Therefore, total contribution lost, when labour is scarce will be: 2,500 hrs.  $\times$  Rs.9 = Rs. 22,500. Therefore, total labour efficiency variance, when labour hours are scarce will be Rs. 40,000 (A) i.e., Rs.17,500 (A)+ Rs.22,500 (A).

Excess usage of 2,500 hours Leads to loss of contribution from 250 units i.e., Rs.22,500 (250 units  $\times$  Rs.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.

( $\text{\$}$ ) Therefore, sales contribution volume variance, when labour hours are scarce will be Rs.22,500 (A) i.e., Rs.45,000 (A)- Rs.22,500 (A).

### **Fixed Overhead Volume Variance**

( $\text{\#}$ ) 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.

