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## CA Final | CA Inter | CA IPCC | CA Foundation Online Test Series

Answer P	aper
SCMPE	Duration: 90
Details: Test – 4	Marks: 50

#### **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 in the 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:-**

(i) Product cost under absorption costing method includes all manufacturing costs that are incurred to produce a product (direct material, labour, and overheads (both fixed and variable). The allocation of overhead is determined by a single cost driver based on volume of production (popular ones are machine hours or direct labour hours). This driver is applied to the entire production overhead to arrive at the production overhead rate. For example, in the given problem, labour hours are being used to allocate overheads to Pianos and Keyboards. All production overheads are allocated to products based on this driver irrespective of whether this resource was used by the product or not. For example, production overheads include maintenance cost relating to space for subcontracting work. This cost is incurred for the manufacture of Piano alone. This portion of the maintenance cost gets clubbed with other production costs. Eventually, an overhead absorption rate is calculated and allocated using the direct labour hours for each product. Absorption costing would ignore the fact that the manufacture of Keyboards does not utilize the space allocated for subcontracting work. This skews the product costing by erroneously inflating the cost of Keyboards, some portion of the cost of manufacturing Pianos passes onto the product cost for Keyboards. Application of a single cost driver may not be the most appropriate way of allocating costs between products. For example, in the given problem, factory rent that is clubbed with total overheads and applied to the product cost as part of the overhead rate. Absorption costing ignores that direct labour may not be the most appropriate basis to allocate factory rent overhead to the products.

Activity based costing identifies the cost of each activity and assigns costs to units produced based on the number of activities used by each unit. Instead of being clubbed as a single overhead cost, costs for each activity are captured in their respective cost pools. The most appropriate cost driver is selected. Cost drivers could be volume based (machine hours/direct hour) or transaction based (# of purchase orders). This cost driver is used as the basis to allocate costs to various products based on the utilization of the resource related to that activity. Overhead costs are assumed to be variable, determined (or driven) by the selected cost driver. Here, the cost of maintaining space for subcontracting relates entirely to the

manufacture of Pianos. Using ABC method, this cost will be allocated only to Piano products since allocation is now based on utilization of the resource to manufacture the product. Again, under this method, factory rent could have space utilization as the cost driver. Therefore, using ABC method, the allocation of rent overhead to the products will be made on a more logical basis as compared to absorption costing.

To conclude, product costing using absorption costing is relatively simpler, a method regularly followed for financial accounting purpose. Product costing using ABC method results in more detailed yet accurate figures. It highlights the cost/ benefit of various activities that helps management focus on eliminating non-value added activities.

#### (ii) Implementation of ABC method within Melody would include the following steps:

**Activity Mapping:** Production process has to be first broken down into various activities. Based on their nature, activities must then be clubbed to form activity pools. Activity pools must then tie in with the products or services.

**Cost Pools:** Overheads costs are then identified to each activity pools. This gives the cost pool for each category of activity.

Cost Driver: Identify the activity that bring about the cost. For example, space utilization would be a standard cost driver for factory rent. Cost drivers could be volume based or transaction based.

**Overhead Rate:** Once the cost pool and cost driver are identified, the cost per unit of cost driver (overhead rate) is determined.

**Overhead Cost Allocation:** Depending on how much of the resource (cost driver) the product utilized, the cost is allocated accordingly to that product.

**Product Cost:** The allocated overhead cost is added to the cost of direct materials and labour to arrive at the full cost of production for the unit.

#### (iii) Appropriateness of ABC Method for the Keyboard and Piano Divisions

The Piano Division receives numerous requests for customization from its customers. While it produces only 1,000 Pianos in a year, no two customizations are the same. Therefore, the range of Pianos manufactured by Melody can be considered varied. Production overheads cost, including subcontracting work, form 35% of the total production cost. ((Rs. 3,75,00,000 + Rs. 4,50,00,000)/ Rs. 23,75,00,000). Therefore, overheads form a substantial portion of product cost. Due to the variety in customization, it is important to price each customization at a rate that will yield an acceptable profit margin to Melody. To do this, manufacturing process has to be segregated into various activities and cost pools. Depending on utilization of resources related to each activity, each Piano can be sold at an appropriate price. If a Piano requires more of a resource from an activity, this can be included in the product cost and factored into the selling price, such that even with customization an acceptable profit margin can be earned. Thus, ABC method can help Melody arrive at a more accurate cost of production as compared to absorption costing.

While, overhead cost is one aspect of ABC analysis, the other information that an organization gets from this framework is that it can identify the activities that add value to the product. At the same time, non-value adding services can be identified (for example storage) and measures can be taken to minimize them. This helps it partner better with its customers and gain a competitive edge.

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The Keyboard Division produces 10,000 Keyboards annually, all sold as a standard product with no customization. Activities are standardized, with no variation in the process between the Keyboards. Production overheads from only 6% of total cost of production. (Rs. 65,00,000/ Rs. 11,15,00,000). Implementation of ABC method is time consuming and complex. Here, due to the standardized nature of production and low quantum of production overheads, ABC method may not be justified for the time and effort involved. In this case, absorption costing may seem to be a more practical approach to arrive at product price.

#### (iv) Activity Based Management to help Melody improve business performance

Activity based management can help Melody to meet the customer needs while using the lowest possible resource or cost. ABM can be used at an operational or strategic level.

#### (a) **Product Pricing**

This would be especially in case of the Piano Division. As explained above, ABC method would enable Melody calculate a more accurate cost of production for each Piano. Currently, the cost of subcontracting work used for customizing Pianos is Rs. 3,75,00,000. This is being charged to the customers with a 10% mark-up to cover for any incidental overhead. However, this is very simplistic. As such the mark-up that can be earned under this method will be Rs. 37,50,000. However, the cost of maintenance of the area for subcontracting work is higher at Rs. 50,00,000. Therefore, it can be concluded that Melody is not recovering the entire portion of the incidental overheads incurred by providing the subcontracting work.

By identifying the cost pools relating to the subcontracting work, Piano Division can determine that it is making a loss on the subcontract work as a whole. It could therefore adjust the price of customized Pianos such that it earns an acceptable margin on each sale. This is at an operational level. At a strategic level, Melody can determine which type of customizations are most profitable. Customizations that are not very frequent, too complex, and costly may be avoided as it takes away resources from Melody in terms of labour, space tec. At the same time, careful consideration should be given to such decisions since it is this customization service that gives Melody an edge over other competitors. Therefore, Melody should take decisions that help it balance the customer base, while keeping the costs low and processes as standardized as possible.

#### (b) Analysis of Activities

Implementation of ABC method forces the company to take a more detailed look at its activities that comprise of its manufacturing process. It may be found that certain activities can be performed in more efficient manner. Also, activities can be identified as that add value to the product and those that are not value adding. For example, in the given example, storage is not a value adding activity. Melody can work on a system where it optimizes the production process

such that storage requirements are lower. The inventory turnover of Piano can also be improved, since quicker the Piano is shipped to the customer, lower the space requirement. Inspection is another non-value adding activity. For example, Melody switch to a standardized procurement system for its raw materials from reputed suppliers. When it may be a costlier option, this may lead to lower defects in the product, therefore requiring lesser need for inspection.

#### (c) Performance Measurement

Employee resource should be used more towards value adding activities. proper training would be required to ensure acceptable quality of work. This would automatically reduce non-value adding activities like rework, idle time, and inspection. There has to be proper information system in place that captures such data. This is facilitated through the implementation of ABC method and use of ABM. However, to have a successful system, senior management need to be committed to this model, proper communication and training has to be given to employees. To implement such a performance system the management has to commit sufficient time and effort.

Cost benefit considerations of having such systems should also be taken into consideration. To conclude, implementing ABM should not take up productive time of employees and become a non-value activity in itself!

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#### **ANS 2:-**

Profitability of each division and the company as a whole when Division X supplies 240,000 units of Gex annually to Division Y.

Division Y produces 1,20,000 units of Gextin. Each component of Gextin requires 2 components of Gex that it currently procures from Division X. Therefore, it procures 2,40,000 units of Gex from Division X annually.

Division X has an overall capacity of 5,00,000 units annually to produce Gex. Of this it produces 2,40,000 units for Division Y, which it must first cater to. The remaining 2,60,000 units of Gex is sold to external customers.

		Divisional	and overall	Profitability	of APC Ltd.(	Amount in Lac	cs	
			Divis	ion X		Divisio		
S. No	Particulars	Per unit of Gex	External sales	Internal Sales	Total division X	per unit of Gextin	External sales	Total Apc Ltd
			2,60,000 units	240,000 units	500,000 units	1	120,000u nits	
1	Selling price	50.00	130.00	120.00	250.00	180.00	216.00	466.00
2	Less: Variable cost	-A						
а	Direct material						1	
b	Component Gex	-	Achievir	g Excelle	nce Togeth	100.00	120.00	120.00
С	other Materials	12.00	31.20	28.80	60.00	22.00	26.40	86.40
d	Direct material	16.00	41.60	38.40	80.00	13.00	15.60	95.60
е	Manufactur ing over- Head	2.00	5.20	4.80	10.00	5.00	6.00	16.00

f	Selling and distribution Costs	4.00	10.40	-	10.40	2.00	2.40	12.80
	Total	34.00	88.40	72.00	160.40	142.00	170.40	330.80
3	Contributio n(Step 1-2)	16.00	41.60	48.00	89.60	38.00	45.60	135.20
4	Annual Fixed Cost				40.00		20.00	60.00
5	Annual Profit (Step 3-4				49.60		25.60	75.20

#### Note

Division X does not incur marketing costs on internal sales. Therefore, cost not incurred on transfer of 240,000 units to Division Y.

(ii) Impact if Division Y accepts to buy 240,000 units of Gex annually from the external supplier at Rs. 47 per unit of Gex

	Divisional and overall Profitability of APC Ltd.(Amount in Lacs										
		Division X				Division Y					
S. No	Particulars	Per unit of Gex	External sales	Internal Sales	Total division X	per unit of Gextin	Extern al sales	Total			
			300,000 units	0	300,000 units		120,00 units				

1	Selling price	50.00	150.00	-	150.00	180.00	216.00	366.00
2	Less: Variable cost							
a	Direct material							
b	Component Gex	-	-	-	-	94.00	112.80	112.80
C	other Materials	12.00	36.00	-	36.00	22.00	26.40	62.40
d	Direct material	16.00	48.00		48.00	13.00	15.60	63.60
е	Manufacturi ng over- Head	2.00	6.00		6,00	5.00	6.00	12.00
f	Selling and distribution Costs	4.00	A.12,00 ing	Excellent	12.00 ner	2.00	2.40	14.40
	Total	34.00	102.00	-	102.00	136.00	163.20	265.20
3	Contribution (Step 1-2)	16.00	48.00	-	48.00	44.00	52.80	100.80
4	Annual Fixed Cost				40.00		20.00	60.00
5	Annual				8.00		32.80	40.80

Profit (Step				
3-4				

#### **Analysis**

#### **APC Ltd**

Overall profitability of APC Ltd. reduces from Rs.75,20,000/- per annum to 540,80,000 per annum. The reduction in profit is therefore Rs. 34,40,000/- per annum. Reasons are:

- (a) The cost of manufacturing Gex is only 30 per unit while Division Y is procuring this at 47 per unit from an external supplier. Annually this results in a loss of Rs. 40,80,000 (240,000 units of GexRs. 17 per unit).
- **(b)** Since Division X no longer makes Gex for internal sales, it can ramp up its external sales to meet the full annual demand of Rs.300,000 units. This results in extra external sales of 40,000 units annually. Each unit gives a contribution of 16 per unit. Therefore, additional contribution from sale of Rs.40,000 units of Gex to external customers is Rs.640,000 per annum.
- (c) Therefore, netting both (a) and (b) above, the net loss to the company is Rs.34,40,000 per annum.

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#### **Division Y**

Impact on profit of Division Y, increase from Rs.25,60,000 per annum to Rs.32,80,000 per annum that is Rs.7,20,000 per annum increase. This is due to the savings in procurement cost of Gex for Division Y. Instead of procuring Gex at Rs.50 per unit Division Y proposes to buy it at 347 per unit externally. For its annual demand of Rs.2,40,000 units of Gex, it translates to savings of Rs.7,20,000 annually in procurement cost for Division Y.

#### **Division X**

Impact on profit of Division X, reduction from Rs.49,60,000 per annum to Rs.8,00,000 per annum. A substantial reduction of Rs.41,60,000 in its divisional profit per year. Division X earns a contribution of 20 per unit of Gex from its internal transfer to Division Y. (Selling price 50 per unit less variable cost of manufacturing 30 per unit). If Division Y procures

Gex externally, this would result in an annual loss of Rs.48,00,000in contribution for Division  $X(240,000 \text{ units} \times \text{Rs.20 per unit})$ . However, due to additional external sale of 44,000 units of Gex, Division X can earn an additional contribution of Rs.6,40,000 per year (40,000 units of Gex  $\times$  Rs. 16 contribution per unit of external sale). Offsetting ,this result in a lower contribution of Rs.41,60,000 per annum for Division X.

This also results in excess capacity of 2,00,000 units per annum in Division X

(iii) APC Ltd. can suffer a loss of 34, 40,000 per annum if Division Y decides to procure Gex from the external supplier. It costs on 30 per unit to manufacture Gex internally as compared to Rs. 47 per unit that Division Y is willing to pay the external supplier. However, Division X is unwilling to reduce the price from Rs. 50 per unit since divisional performance is done based on the profit margin ratio of the division. Therefore, the management of the company has to step in to promote goal congruence. If Division Y buys GEX from the area supplier, not only is it costly for the company, it also results in a lot of unused capacity lying idle in Division X.

In the current scenario, one possible way of arriving at an acceptable transfer price range could be:

Division X has a capacity of 5,00,000 units per annum. Of this production 3,00,000 units is supplied to external market and 2,00,000 units are idle. The marginal cost of production of Gex for transfer is Rs.30 per unit. If this were sold externally, it would earn a contribution of Rs.16 per unit. Therefore, the minimum transfer price the Division X would demand = marginal cost of production per unit + opportunity cost per unit.

For idle capacity of 200,000 units, there will be no opportunity cost. Hence the minimum transfer price for these 2,00,000 units =Rs. 30. For remaining 40,000 units, the Division will have

to forego its external sales. The minimum transfer price for these 40,000 units = Rs.30 + Rs.16=Rs.46 per unit of Gex

Division Y will be willing to pay the lower of net marginal revenue or the eternal buy in price.

The Net Marginal Revenue per unit of Gex tin=Selling price per Gex tin- (marginal cost for Division Y other than the cost of Gex) = Rs.180-Rs.42 = Rs.138 per unit of Gex tin. This translates that Division Y will be willing to pay upto Rs.69 per unit of Gex, that it can incur without incurring a divisional loss. Meanwhile the external buy-in price is Rs.47 per unit.

Therefore, the maximum price Division Y will be willing to pay = lower of Net Marginal Revenue or external buy-in price = lower of Rs.69 or Rs.47 per unit of Gex. Therefore Division Y will be willing to pay maximum Rs. 47 per unit of Gex to Division X.

Therefore, the transfer price range can be set between Rs.30-Rs.47 per unit of Gexfor initial 2,00,000 units and Rs.46 -Rs. 47 per unit of Gex for additional 40,000 units. Division would then have to compete with the external supplier to retain its internal sales. This would promote more efficient working between Division X and Y By selling it at Rs.46 per unit the contribution of Division X would be maintained at 16 per unit. For Division the procurement of Gex at Rs.46 per unit would be beneficial since it is lower than the external market price. If transfer price set at external market rateRs. 47 per unit Division Y would still be able to improve its profit margin as compared to the original transfer price of 50 per unit.

Give that the marginal cost of manufacturing Gex is only Rs. 30 per unit, the management has to ensure that production of Gex is made in –house. Performance measure at a divisional level should then not be restricted to finical performance alone (full profit responsibility) and should be accordingly modified to include nonfinancial/ operational measures as well.

#### **ANS 3:-**

#### Situation I

The lowest acceptable transfer price from the perspective of the selling division is given by the following formula:

The pulp Division has no idle capacity, so transfer from the pulp Division to the Carton Division would cut directly into normal sales of pulp to outsider. Since the cost are the same whether the pulp is transferred internally or sold to outsiders, the only relevant cost is the lost revenue of Rs.210 per kg from the pulp that could be sold to outsiders. This is confirmed below:

Transfer price =Rs. 
$$126 + \frac{(Rs.210 - Rs.126) \times 10,000}{10,000} = Rs. 210$$

Therefore, the pulp Division will refuse to transfer at a price less than Rs.210 per kg.

The carton Division can buy pulp from an outside supplier for Rs.210 per kg, less a 10% quantity discount of Rs.21, or Rs.189 per kg. Therefore, the division would be unwilling to pay more than Rs.189 per kg.

Maximum Transfer price≤ cost of buying from outside supplier =Rs.189

The requirements of the two divisions are incompatible. The carton Division won't pay more than Rs. 189 and the Pulp Division will not accept less than Rs.210. Thus, there can be no mutually agreeable transfer price and no transfer will take place.

#### Situation II

The pulp Division has idle capacity, so transfer from the pulp division to the carton Division do not cut into normal sales of pulp to outsiders. In the case, the minimum price as far as the carton Division is concerned is the variable cost per kg of Rs. 126. This is confirmed in the following calculation:

Transfer price =Rs.126+
$$\frac{0}{10.000}$$
 = Rs. 126

The carton division can buy pulp from an outside supplier for Rs.189 per kg and would be unwilling to pay more than for pulp in an internal transfer. If the managers understand their own business and are cooperative, they should agree to a transfer and should settle on a transfer price within the range – Rs.126 to Rs.189

#### Situation III

Yes, Rs. 177 is a **bonafide outside** price .even though Rs.177 is less than the Pulp Division's Rs.180 "Full cost" per unit; it is within the range and therefore will provide some contribution to the Pulp Division, assuming it has idle capacity.

If the Pulp Division does not meet the Rs.177 price, it will lose Rs.5,10,000 in potential profits.

Particulars	Amount in Rs.
Price per kg	177
Less: variable Costs	126
Contribution margin per kg	51

10,000 kgs × Rs.51 per kg= Rs. 5,10,000/- potential increased profits

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#### ANS 4:-

B will not pay A anything more than 13, because at 13, it will incur additional cost of Rs. 2/- to modify it, 13+2= 15, the outside cost.

Α		В	С
Outside sale	Transfer to B & C		

Divisional variable cost of production	7	7	19	25
Transfer from A			13	13
Modification			2	
Total Variable Cost of production	7	7	34	38
Selling Price	15	13	40	50
Contribution	8	6	6	12

## Option for C, purchase all units from A @ 13: Any other option is costlier.

	A	B	c
Maximum external demand	3,750	5,000	4,000
Existing capacity	5,000	2,500	2,500
Maximum capacity that can be added	5,000	1,250	2,250
Total maximum that can be produced	Excel0,000 Tog	ether 3,750	4,750
Additional fixed cost on expansion	24,000	6,000	18,700
Units that must be sold/ transfer to get this amount as contribution	24,000 ÷ 6 = 4,000	6,000 ÷6 = 1,000	18,700 ÷ 6 = 1,558.33
External demand not covered by existing capacity	Expand	Expand	Donot Expand

Decision	Make 10,000 units 3,750 - Outside 3,750- B 2,500 -C	Make 2,500 +1,250 = 3,750 units	Make only 2,500 units.
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		Α	В	С
	Outside sale	Transfer to B & C		1/2
Units	3,750	3,750 +2,500 = 6,250		2,500
Contribution/ unit	8	6	6	12
Contribution (Rs.)	30,000	37,500	22,500	30,000
	6	57,500	22,500	30,000
Additional Fixed Cost	24,000		6,000	
Net revenue addition	43,500 Achieving Excellence Toge		16,500	30,000
	onevin	g Excellence Tog	ent	

Best strategy of Co.

If Division A transfer's goods to B & C at variable cost (i.e.7 p.u.) instead 13 p.u. then,

	В	С	
Contribution p.u. (Internal Purchase & external sales)	12	8	

Strategy I (Current Strategy)			
	А	В	С
External sales:			
External purchase	3750	-	-
Internal Purchase	-	3750	2500

Total Profit of Co. = Rs. 90,000

Strategy II	E		
The transfer of the transfer o	A	В	M c
External sales:		7	
External purchase	3750	- -	1500
Internal purchase		3750	2500
Internal sales	hieving F <sub>6250</sub> llence To	gether	-

## Total Profit & Co. = Rs. 84750

Strategy III			
-	A	В	С
External sales:			

External purchase	3750	1500	-
Internal purchase	-	2250	4000
Internal sales	6250	-	-

Total Profit of Co. = Rs. 89250

Individual strategy is the company's best strategy.

Division 'A' will transfer maximum possible material to Division 'C' as Division 'C' is offering maximum transfer price to Division 'A'. At the same time Division 'C' is fetching maximum contribution for the organization so it is beneficial for both the Divisions as well as organization as a whole.

ANS-5:

### **Working Notes:**

Particulars	P	Q
a) Production/Sales quantity (units	1,00,000 ing Excellence Together	50,000
b) batch Size (units)	1,000	500
c) No. of batches ( a ÷ b)	100	100
d) Set up time per batch (hours)	30	36
e) Total set up hours ( c × d) ( hours)	3,000	3,600
f) Machine set up cost (Rs.)		4,62,000

g) Cost driver per machine set up hour (4,62,000 ÷ 6,600 = Rs. 70)		
h) Testing time per unit ( hours)	5	9
i) Total testing time ( a × h) (hours)	5,00,000	4,50,000
j) Testing cost = Rs. 23,75,000		
k) Cost driver per testing hour (23,75,000 ÷ 9,50,000 = Rs. 2.50)		
	1	

(a) Computation of full cost per unit using Activity Based Costing:				
Particulars	Basis	P	Q	
Direct material	Direct	42,00,000	30,00,000	
Direct labour	Direct	15,00,000	10,00,000	
Direct Machine cost	Direct	7,00,000	5,50,000	
Machine set up cost	3,000 hrs. @ Rs. 70 nce Togethe	2,10,000		
	3,600 hrs. @ Rs. 70		2,52,000	
Testing cost	5,00,000 hrs. @ Rs. 2.50	12,50,000		
	4,50,000 hrs. @ Rs. 2.50		11,25,000	
Engineering Cost	Allocated	8,40,000	14,10,000	
Total cost (Rs.)		87,00,000	73,37,000	

Cost per unit (Rs.)	87.00	146.74
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(b) Mark up on full cost basis for product P:			
Particulars	per unit		
Selling price	100.05		
Less: Full cost	87.00		
Mark up	13.05		
Percentage of mark up on full cost	( 13.05 ÷ 87.00 × 100) = 15%		

(c) Target cost of product P after new design is implemented:	
	Rs.
Target price (given)	86.25
Mark-up {( 86.25 × 15) ÷ 115} Achieving Excellence Together	11.25
Target cost per unit (Rs.)	75.00

(d) Statement of Cost for new design of P			
Particulars Basis Cost p.u. Total Cost			
Direct material	Decrease by Rs. 5 p.u.	37.00	37,00,000

Direct labour	Decrease by Rs. 2 p.u.	13.00	13,00,000
Direct Machining cost	No change as machine is dedicated	7.00	7,00,000
Machine set up cost	100 set up × 28 hrs. × Rs. 70	1.96	1,96,000
Testing cost	1,00,000 units × Rs. 2.50 × 4 hrs.	10.00	10,00,000
Engineering Cost	No change	8.40	8,40,000
Total cost		77.36	77,36,000

The target cost is Rs. 75 p.u. and estimated cost of new design is Rs. 77.36 p.u. The new design does not achieve the target cost set by Compute Ltd. Hence the target mark up shall not be achieved.

#### (e) Possible Management Action:

- Value engineering and value analysis to reduce the direct material costs.
- Time and motion study in order to redefine the direct labour time and related costs.
- Exploring possibility of cost reduction in direct machining cost by using appropriate techniques.
- Identification of non- value added activities and eliminating them in order to reduce overheads.

The expected selling price based on estimated cost of Rs. 77.36 per unit is (Rs. 77.36 + 15%) Rs.88.96. Introduce sensitivity analysis after implementation of new design to study the sales quantity changes in the price range of Rs. 86.25 to Rs. 88.96.