

MOCK TEST PAPER – 1
FINAL COURSE: GROUP – II
PAPER – 5: ADVANCED MANAGEMENT ACCOUNTING
SUGGESTED ANSWERS/HINTS

1 (a) Budgeted profit statement in marginal costing format:

		Apr to Sep' 2012 (₹)		Oct to Mar' 2013 (₹)
Sales		2,70,000		1,80,000
Variable costs of Sales		<u>1,42,500</u>		<u>95,000</u>
Contribution		1,27,500		85,000
Less: Fixed Costs:				
Production Overhead	12,000		12,000	
Selling Costs	25,000		25,000	
Distribution Cost	15,000		15,000	
Administration	<u>40,000</u>	<u>92,000</u>	<u>40,000</u>	<u>92,000</u>
Profit/ (Loss)		35,500		(7,000)

Reconciliation of the six-monthly profit/(loss) values reported respectively under marginal and full absorption method

	Apr to Sep' 2012	Oct to Mar' 2013
Absorption profit	38,500	(11,000)
Carry forward of fixed overhead in stock		
6,000 x (₹5-₹4.50):	(-) 3,000	
8,000 X (₹5-₹4.50):		<u>4,000</u>
Marginal Profit	<u>35,500</u>	<u>(7,000)</u>

Marginal Cost Unit Stock Valuation: ₹ 4.50

(Distribution cost will not be included)

(₹ 4.75 – ₹ 0.25)

Absorption cost unit stock valuation:

(₹ 1,50,000/30,000 units) or

(₹ 1,00,000/20,000 units) ₹ 5.00

Reconciliation of the six-monthly profit ₹ 38,500 for Apr to Sep 2012 with the six-monthly loss ₹ 11,000 for Oct to March 2013

	₹
Profit from Apr-Sep 2012	38,500
Reduction in sales volume [10,000x ₹ 4*]	(40,000)
Difference in overhead recovery (6,000x2)	(12,000)
Reduction in distribution cost	<u>2,500</u>
Loss from Oct to Mar 2012	<u>(11,000)</u>

*Absorption gross profit per unit: ₹ 4
 (1,20,000/30,000) or
 (80,000/20,000)

Annual number of units required to break-even:

₹
 Fixed Costs (₹ 92,000 x2) 1,84,000
 Contribution per unit 4.25
 Annual Break-Even Point (₹ 1,84,000 / 4.25) = 43,294 units

Workings Notes:

Variable element per unit and fixed portion for the production overhead (for six months) will be:

Variable production overhead per unit:

= Change in total production cost / change in units produced
 = {(45,000-6,000)-(15,000+6,000)} / (36,000-12,000)
 = ₹ 0.75 per unit

Fixed production overhead for six months:

= ₹ 39,000-(36,000 X ₹ 0.75) = ₹ 12,000/-

Variable element per unit and fixed portion for the distribution overhead (for six months) will be:

Variable distribution cost per unit:

= change in total distribution cost / change in units sold
 = (22,500-20,000) / (30,000-20,000)
 = ₹ 0.25 per unit

Fixed distribution cost for the period:

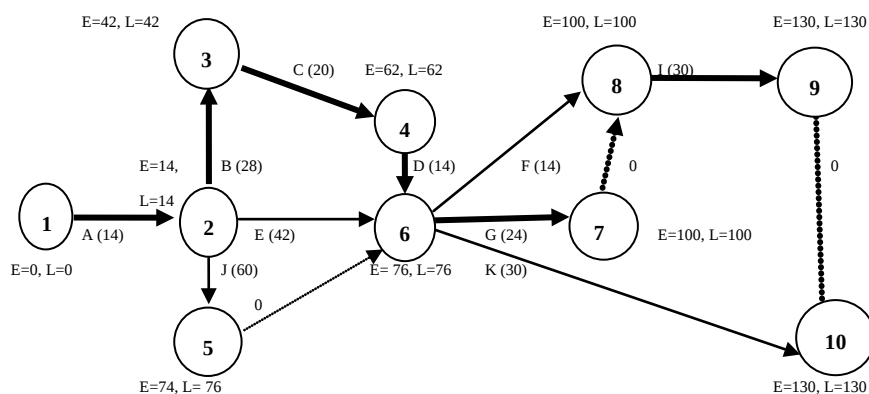
$$= ₹ 22,500 - (30,000 \times 0.25)$$

$$= ₹ 15,000$$

Unit Cost	₹	₹
Selling Price		9.00
Less: Variable Costs		
Direct Material	1.50	
Labour	2.25	
Variable Overhead	0.75	
Distribution Costs	<u>0.25</u>	<u>4.75</u>
Contribution per unit		4.25

(b) Critical Path: 1-2-3-4-6-7-8-9-10

Network Diagram:



(c) Degeneracy : A transportation problem has $m + n - 1$ basic variables which means that the number of occupied cells is such a solution is one less than the number of rows plus the number of columns. It may happen sometimes that the number of occupied cells is less than $m + n - 1$. Such a solution is called a degenerate solution.

2 (a) Statement showing manufacturing cost

	Z2001	Z2002
	₹/unit	₹/unit
Material:	203.75	146.05
Overhead:		
Material handling	43×0.60 25.80	23×0.60 13.80

Assembly Management	2×20.00	40.00	1×20.00	20.00
Machine insertion	24×00.35	8.40	15×00.35	5.25
Manual insertion	18×01.05	18.90	8×01.05	8.40
Quality testing	1×12.50	12.50	1×12.50	12.50
Present cost	309.35		206.00	
Target cost	295.00		180.00	
		Revised Z2001	Revised Z2002	
		₹/unit	₹/unit	
Material	190.60		131.55	
Overhead:				
Material handling	36×0.60	21.60	19×0.60	11.40
Assembly Management	1×20.00	20.00	2×20.00	20.00
Machine insertion	29×00.35	0.15	14×00.35	4.90
Manual insertion	6×01.05	6.30	5×01.05	5.25
Quality testing	2×12.50	25.00	1×12.50	12.50
Present cost	273.65		185.60	
Target cost	295.00		180.00	
		Achieved	Not achieved	

(b) Limitations of Value Chain Analysis:

1. **Non-availability of data:** Internal data on costs, revenues and assets used for value chain analysis are derived from financial information of a single period. For long term strategic decision making, changes in cost structures, market prices and capital investments etc. may not be readily available.
2. **Identification of stages:** Identifying stages in an industry's value chain is limited by the ability to locate at least one firm that participates in a specific stage. Breaking a value stage into two or more stages when an outside firm does not complete in these stages is strictly judgment.
3. **Ascertainment of cost, revenues and assets:** Finding the costs revenues and assets for each value chain activity poses/gives rise to serious difficulties. There is no scientific approach and much depends upon trial and error and experimentation methods.
4. **Identification of cost drivers:** Isolating cost drivers for each value-creating activity, identifying value chain linkages across activities and computing supplier and customer profit margins present serious challenges.
5. **Resistance from employees:** Value chain analysis is not easily understandable to all employees and hence may face resistance from employees as well as managers.

6. **Science Vs Art:** Value chain analysis is not exact science. It is more “art” than preparing precise accounting reports. Certain judgments and factors of analysis are purely *subjective and differ from person to person*.

- (c) CPM is a deterministic model i.e. It does not take into account the uncertainties involved in the estimation of time for execution of a job or an activity. It completely ignores the probabilistic element of the problem. PERT, however, is a probabilistic model. It uses three estimates of the activity time; optimistic, pessimistic and most likely; with a view to take into account time uncertainty. Thus, the expected duration of each activity is probabilistic and expected duration indicates that there is fifty per cent probability of getting the job done within that time.

3. (a) **Production Budget for Aug 2012**

	PNM (units)	PNO (units)	PNP (units)
Sales*	11,700	3,400	4,100
Less: Opening Stock	<u>4,500</u>	<u>3,000</u>	<u>3,750</u>
	7,200	400	350
Add: Closing stock 10% reduction	<u>4,050</u>	<u>2,700</u>	<u>3,375</u>
	<u>11,250</u>	<u>3,100</u>	<u>3,725</u>

* (sales in ₹ /price per unit)

Material Usage Budget for Aug 2012

Product	Units of Product	MPD Qty. per unit of Product	Quantity Required	MND Qty. per unit of Product	Quantity Required	MOD Qty. per unit of Product	Quantity Required
PNM	11,250	8	90,000	-	-	8	90,000
PNO	3,100	-	-	15	46,500	8	24,800
PNP	3,725	18	<u>67,050</u>	14	<u>52,150</u>	-	-
			<u>1,57,050</u>		<u>98,650</u>		<u>1,14,800</u>

Material Purchase Budget for Aug 2012

	MPD		MND		MOD	
	Units	₹ (3/-)	Units	₹ (6/-)	Units	₹ (2/-)
Usage	1,57,050	4,71,150	98,650	5,91,900	1,14,800	2,29,600
Less: O/stock	<u>36,750</u>	<u>1,10,250</u>	<u>30,750</u>	<u>1,84,500</u>	<u>26,250</u>	<u>52,500</u>
	1,20,300	3,60,900	67,900	4,07,400	88,550	1,77,100
(Add: C/stock)	<u>29,400</u>	<u>88,200</u>	<u>24,600</u>	<u>1,47,600</u>	<u>21,000</u>	<u>42,000</u>
	<u>1,49,700</u>	<u>4,49,100</u>	<u>92,500</u>	<u>5,55,000</u>	<u>1,09,550</u>	<u>2,19,100</u>

Budgeted Profit/(Loss) Statement for each product and in total for Aug 2012

	PNM	PNO	PNP
Sales	₹ 46,80,000	₹ 16,32,000	₹ 22,96,000
Less: Cost	<u>37,44,000</u>	<u>13,05,600</u>	<u>18,36,800</u>
	<u>9,36,000</u>	<u>3,26,400</u>	<u>4,59,200</u>

Working Notes:

Statement showing selling price for each product:

	PNM		PNO		PNP	
		(₹)		(₹)		(₹)
Material:						
MPD	(₹3x8)	24		-	(₹3x18)	54
MND		-	(₹6x15)	90	(₹6x14)	84
MOD	(₹2x8)	<u>16</u>	(₹2x8)	<u>16</u>		<u>-</u>
		<u>40</u>		<u>106</u>		<u>138</u>
Labour:						
DMM	(₹4x6)	24	(₹4x3)	12	(₹4x3)	12
DMO	(₹3x9)	27	(₹3x3)	9	(₹3x4)	12
DMP	(₹2x3)	<u>6</u>	(₹2x6)	<u>12</u>	(₹2x9)	<u>18</u>
		<u>57</u>		<u>33</u>		<u>42</u>
Variable Overhead:		28		41		19
Fixed Cost:						
DMM	(₹5x6)	30	(₹5x3)	15	(₹5x3)	15
DMO	(₹3x9)	27	(₹3x3)	9	(₹3x4)	12
DMP	(₹6x3)	<u>18</u>	(₹6x6)	<u>36</u>	(₹6x9)	<u>54</u>
		<u>75</u>		<u>60</u>		<u>81</u>
Total Production Cost:		200		240		280
Adm.(Based on 40% of production cost		80		96		112
Selling and Dist. Cost (Based on 20% of production cost)		40		48		56
Total Cost:		320		384		448

Profit (25%)		80		96		112
Selling Price per unit		400		480		560

Fixed Overhead Rate:

DMM= ₹ 4,39,875 / 87,975 = ₹ 5 per hour

DMO= ₹ 3,76,350 / 1,25,450 = ₹ 3 per hour

DMP= ₹ 5,15,250 / 85,875 = ₹ 6 per hour

Cost of Products:

PNM = ₹ 11,700X320= ₹ 37,44,000

PNO = ₹ 3,400x384= ₹ 13,05,600

PNP = ₹ 4,100x448= ₹ 18,36,800

- (b) Skimming pricing-It is a policy where the prices are kept high during the early period of a product's existence. This can be synchronized with high promotional expenditure and in the latter years the prices can be gradually reduced. The reasons for following such a policy are as follows:

- (1) The demand is likely to be inelastic in the earlier stages till the product is established in the market.
- (2) The gradual reduction in price in the latter years will tend to increase the sales.
- (3) This method is preferred in the beginning because in the initial periods when the demand for the product is not known the price covers the initial cost of production.
- (4) High initial capital outlays needed for manufacture, results in high cost of production. In addition to this, the producer has to incur huge promotional activities resulting in increased costs. High initial prices will be able to finance the cost of production particularly when uncertainties block the usual sources of capital.

- 4 (a) Expressing the problem in the standard form by adding surplus variables S_1 and S_2 and artificial variables A_1 and A_2 , M is a large number.

Minimize $Z=30 x_1+40 x_2+0S_1 + 0S_2 +M A_1+M A_2$

Subject to the constraints

$10 x_1+15 x_2- S_1 + A_1=450$

$20 x_1+15 x_2- S_2+ A_2=600$

$x_1, x_2, S_1, S_2, A_1, A_2 \geq 0$

C_j	Basic Variables	Solution Values	30	40	0	0	M	M	Minimum Ratio
M	A_1	450	10	15	-1	0	1	0	45

M	A ₂	600	<u>20</u>	15	0	-1	0	1	← 30
	Z _j		30M	30M	-M	-M	M	M	
	C _j -Z _j		30-30M	40-30M	M	M	0	0	

30-30M is largest -ve

C _j	Basic Variables	Solution Values	30	40	0	0	M	M	Minimum Ratio
			x ₁	x ₂	S ₁	S ₂	A ₁	A ₂	
M	A ₁	150	0	<u>15/2</u>	-1	1/2	1	-1/2	← 20
30	x ₁	30	1	3/4	0	-1/20	0	1/20	40
	Z _j		30	15/2M+45/2	-M	M/2-3/2	M	-M/2+3/2	
	C _j -Z _j		0	-15/2M+35/2	M	-M/2+3/2	0	3/2M-3/2	

-15/2M+35/2 is largest -ve

C _j	Basic Variables	Solution Values	30	40	0	0	M	M	Minimum Ratio
			x ₁	x ₂	S ₁	S ₂	A ₁	A ₂	
40	x ₂	20	0	1	-2/15	1/15	2/15	-1/15	
30	x ₁	15	1	0	1/10	-1/10	-1/10	1/10	
	Z _j		30	40	-7/3	-1/3	7/3	1/3	
	C _j -Z _j		0	0	7/3	1/3	M-7/3	M-1/3	

Since all entries in C_j-Z_j row are either zero or positive in table III, the current solution is the optimum one and is given by:

x₁=15, x₂=20, Minimum Z=1,250

- (b) The operations of a firm are so inter linked that the level of performance in one area of operation will affect the performance in other areas. Improvements in one area may lead to improvements in other areas. A sub-standard performance in one area may be compensated by a favourable performance in another area. Because of such interdependency among activities in the firm, the managers should not jump to conclusions merely based on the label of variances namely favourable or unfavourable. They should remember that there is a room for trade off amongst variances. Hence, variances need to be viewed as 'attention directors' rather than problem solvers. Thus, a better picture will be captured when overhead variance are not viewed in isolation but in an integrated manner.

5 (a) Standard hours produced

	Product X	Product Y	Total
Out put (units)	600	400	
Hours per unit	4	6	
Standard hours	2,400	2,400	4,800

Actual hours worked

$$20 \text{ workers} \times 8 \text{ hours} \times 26 \text{ days} = 4,160$$

Budgeted hours per month

$$36,000/12 = 3,000$$

$$\text{Capacity Ratio} = \frac{\text{actual hours}}{\text{Budgeted hours}} \times 100 = \frac{4,160}{3,000} = 138.67 \%$$

$$\text{Efficiency Ratio} = \frac{\text{Standard Hours Produced}}{\text{Actual hours}} \times 100 = \frac{4,800}{4,160} \times 100 = 115.38\%$$

$$\text{Activity Ratio} = \frac{\text{Standard Hours Produced}}{\text{Budget hours}} \times 100 = \frac{4,800}{3,000} \times 100 = 160.00\%$$

(b) Tools and techniques for cost reduction :-

1. Budgetary control and standard cost.
2. Work study and organisation and method of procedure.
3. Value analysis.
4. Standardisation.
5. Simplification and variety reduction.
6. Economic batch quantity (E. B. Q.)
7. Coding and classification.
8. Improvement in design.
9. Substitute material utilisation.
10. Automation.
11. Operational Research.
12. Quality Control.
13. Production Planning and Control.
14. Inventory Control.
15. Purchase Scheduling.
16. Job evaluation and merit voting.
17. Training and development.
18. Business forecast.
19. Market Research.

- (c) It is justifiable to sell at a price below marginal cost for a limited period. The circumstances may be:
- (i) Where materials are of perishable nature.
 - (ii) Where stocks have been accumulated in large quantities and the market prices have fallen. This will save the carrying cost of stocks, e.g., electronic goods – market prices fall due to quick obsolescence or advanced technological replenishment.
 - (iii) It is essential to reduce the prices to such an extent in order to popularize a new product.
 - (iv) Where such reduction enables the firm to boost the sales of other products having larger profit margin.
- (d) **Going Rate Pricing:** It is a competitive pricing method under which a firm tries to keep its price at the average level charged by the industry. The use of such a practice of pricing is specially useful where it is difficult to measure costs. Adoption of going rate pricing will not only yield fair return but would be least disruptive for industry's harmony.

Throughput Accounting (TA): Throughput Accounting is a method of performance measurement which relates production and other costs to throughput. Throughput accounting product costs relate to usage of key resources by various products. It assumes that a manager has a given set of resources available. These comprise the existing buildings, capital equipment and labour force. Using these resources, purchased materials and components must be processed to generate sales revenue. To achieve this, maximum amount of throughput is required with the financial definition.

6 (a) (A) Calculation of variances:

The cost sheet for 1,080 units will appear as under:

Cost	Std. qty.	Std. rate	Std. cost ₹
Direct material	12,960	1.20	15,552
Direct labour	3,240	3.60	11,664
Overheads	3,240	7.20	<u>23,328</u>
			<u>50,544</u>

Material Variances

Material price variance:

$$= 11,400 \text{ Pcs.} \times (\text{₹ } 1.20 - \text{₹ } 1.32) = \text{₹ } 1,368 \text{ (A)}$$

Material usage variance:

= ₹ 1.20 x (12,960 pcs. – 11,400 pcs.)

= ₹ 1,872 (F)

Labour Variances

Labour rate variance:

= 2,970 hrs. (₹ 3.60 – ₹ 4.20) = ₹ 1,782 (A)

Labour efficiency variance:

= ₹ 3.60 (3,240 hrs. – 2,970 hrs.) = ₹ 972(F)

Overhead variances:

(a) Charged to production as per cost sheet	₹ 23,328
(b) Actual hours × Std. rate: 2,970 hrs. × ₹ 7.20	₹ 21,384
(c) Overheads as per budget	₹ 19,800
(d) Actual overheads	₹ 20,400
Efficiency variance : (a – b)	₹ 1,944 (F)
Capacity variance : (b – c)	₹ 1,584 (F)
Expense variance : (c – d)	₹ 600 (A)
Total variance : (a – d)	₹ 2,928 (F)

(B) Journal entries for recording these transactions are as under:

	₹	₹
(i) Material Control A/c Dr. To General Ledger Adjustment A/c (Being the purchase value of 12,000 pieces of materials at ₹ 1.32 each)	15,840	15,840
(ii) Work-in-Progress A/c Dr. To Material Control A/c (Being the cost of 11,400 pieces of materials actually issued to production at the actual price of ₹ 1.32 each)	15,048	15,048
(iii) Work-in-Progress A/c Dr. To Wages Control A/c Being the actual amount of direct wages paid for 2,970 hours at ₹ 4.20 per hour)	12,474	12,474

(iv) Work-in-Progress A/c	Dr	20,400	
To Overhead Expense Control A/c			20,400
(Being the actual overhead expenses incurred)			
(v) Finished Stock Control A/c	Dr.	50,544	
To Work-in-Progress A/c			50,544
(Being the standard cost of production transferred to finished goods account)			
(vi) Cost of Sales A/c	Dr.	50,544	
To Finished Stock Control A/c			50,544
(Being the standard cost of goods sold transferred to Cost of Sales A/c)			

Journal entry for transferring the variances to their respective accounts is as under:

		Dr.	Cr.
Material price variance A/c	Dr	1,368	
Labour rate variance A/c	Dr	1,782	
Overhead expense variance A/c	Dr	600	
Work-in-progress A/c	Dr	2,622	
To Material usage variance A/c			1,872
To Labour efficiency variance A/c			972
To Overhead efficiency variance A/c			1,944
To Overhead capacity variance A/c			1,584
(Being the variance charged)			

(C) Ledger Accounts:

Material Control A/c

Dr.			Cr.
	₹		₹
To Opening balance	-	By Work-in-Progress A/c	15,048
To General Ledger		By Balance c/d	792
Adjustment A/c	15,840		
	<u>15,840</u>		<u>15,840</u>

Work-in-Progress Control A/c

Dr.	₹	–	Cr.	₹
To Opening balance			By Finished stock control A/c	50,544.00
To Material control A/c	15,048.00		By Material price variance A/c	1,368.00
To Wages control A/c	12,474.00		By Labour rate variance A/c	1,782.00
To Overheads control A/c	20,400.00		By Overhead expense Variance A/c	600.00
To Material usage variance A/c	1,872.00			
To Labour efficiency variance A/c	972.00			
To Overhead efficiency Variance A/c	1,944.00			
To Overhead capacity Variance A/c	<u>1,584.00</u>			
	<u>54,294.00</u>			<u>54,294.00</u>

Note: Assumed that there is no closing balance of work-in progress.

- (b) Usually a conflict between a division of the company and the company as a whole is faced by the management of decentralized units when products or services are exchanged among different divisions of the company. Such a conflict becomes more significant in the case of those concerns where profitability is used as criteria for evaluating the performance of each division. A divisional head in a company under aforesaid set up is free to use a price as a transfer price for goods and services, which may provide incentive. Such a transfer price may fail to achieve the objective of 'Goal congruence' which means a perfect congruence between division's goal and the goal of the company. In case of failure of a division to achieve the objective of 'Goal congruence' the management of the company may dictate their transfer price. Such an interference of management of the company is usually the main basis of conflict between a division and the company as a whole. Further this conflict is aggravated if the management advocates the transfer of goods and services at cost. As such, the transfer price will not reflect a good picture about the performance of the transferring division. The profitability of the transferring division will not be known by the use of such a transfer price. Each division appreciates the transfer of its goods/services at usual selling price/market price so as to arrive at the correct return / profitability figure, used for measuring the performance. There is no incentive to the transferring division if goods and services are transferred at variable cost.

7 (a) Calculation of Probability

Supply			Demand		
Availability (kg)	No. of days	Probability	Demand (kg)	No. of days	Probability
5	20	$20/(50 \times 5) = 0.08$	5	25	$25/(50 \times 5) = 0.10$
10	25	$25/(50 \times 5) = 0.10$	10	55	$55/(50 \times 5) = 0.22$
15	95	$95/(50 \times 5) = 0.38$	15	100	$100/(50 \times 5) = 0.40$

20	75	$75/(50 \times 5) = 0.30$	20	50	$50/(50 \times 5) = 0.20$
25	35	$35/(50 \times 5) = 0.14$	25	20	$20/(50 \times 5) = 0.08$

The demand and supply patterns yield the following probability distribution. The numbers 00-99 are allocated in proportion to the probabilities associated with each event.

Availability (kg)	Prob.	Cum. Prob. Allocated	Random Numbers	Demand (kg.)	Prob.	Cum. Prob. Allocated	Random numbers
5	0.08	0.08	00-07	5	0.10	0.10	00-09
10	0.10	0.18	08-17	10	0.22	0.32	10-31
15	0.28	0.56	18-55	15	0.40	0.72	32-71
20	0.30	0.86	56-85	20	0.20	0.92	72-91
25	0.14	1.00	86-99	25	0.08	1.00	92-99

Let us simulate the supply and demand for the next five days using the given random numbers in order to find the profit if the cost of the commodity is ₹10 per kg, the selling price is ₹15 per kg, loss on any unsatisfied demand is ₹4 per kg and unsold commodities at the end of the day have no saleable value.

Day	Random No	Supply Availability	Random No.	Demand	Buying cost	Selling cost	Units bought & sold	Short supply	Excess supply	Net Profit
1	32	15	20	10	150	150	10	-	5	0 (10*5- 5*10)
2	65	20	85	20	200	300	20	-	-	100 (20*5)
3	17	10	35	15	100	225	10	5	-	30 (10*5- 5*4)
4	07	5	33	15	50	225	5	10	-	-15 (5*5- 10*4)
5	45	15	80	20	150	300	15	5	-	55 (15*5- 5*4)

Profit per Kg is ₹ 5 (₹ 15- ₹10)

Loss on any unsatisfied demand is ₹4 per kg

Cost of commodity (remains at the end of the day, has no saleable value) is ₹10

During the simulated period of five days, the net profit of the retailer is

$$=0+100 +30 + 55- 15 = ₹170$$

- (b) Application of Learning curve: Learning curve helps to analyze cost-volume profit relationships during familiarization phase of product or process to arrive at cost estimates. It helps in budgeting and profit planning. It helps in pricing and consequent decision making – e.g. acceptance of an order, negotiations in establishing contract prices etc. with the advantage of the knowledge of decreasing unit cost. It helps in setting standards in the learning phase.
- (c) The factors involved in decisions relating to expansion of capacity are enumerated as below:
 - (i) Additional fixed overheads involved should be considered.
 - (ii) Possible decrease in selling price due to increased production capacity.
 - (iii) Whether the demand is sufficient to absorb the increased production.
- (d) The seller quotes the selling price at the point of production and the buyer selects the mode of transportation and pays all freight costs. This method of pricing is referred as FOB factory pricing.