INTERMEDIATE EXAMINATION
GROUP II
(SYLLABUS 2012)

SUGGESTED ANSWERS TO QUESTIONS

JUNE 2015

Paper-10: COST & MANAGEMENT ACCOUNTANCY

Time Allowed: 3 Hours **Full Marks: 100**

The figures in the margin on the right side indicate full marks.
This paper contains four questions.
All questions are compulsory, subject to instruction provided against each question.
All workings must form of your answer.
Assumptions, if any, must be clearly indicated.

Please: (1) Write answers to all parts of a question together.
(2) Open a new page for answer to a new question.
(3) Attempt the required number of questions only.

1. Answer all questions.

(a) SHRIJINI LTD. having a Margin of Safety of `4 lakh makes a profit of `80,000. If its Fixed Cost is `5 lakh, what will be Break-Even Sales of SHRIJINI LTD? 2

(b) In a factory of ASHLIN LTD., where Standard Costing System is followed, the production department consumed 1100 kgs, of a material @ `8 per kg. for Product- A resulting in material price variance of `2,200(FAV) and material usage variance of `1,000 (Adv.). What is the standard material cost of Actual Production of a Product – A? 2

(c) OPTIMA LTD. operates a Throughput Accounting System. The details of Product–Z per unit are as under:

	`
Selling price	45
Material cost	18
Conversion cost	22
Return per hour for Product – Z	270

What is the time on bottleneck Resources (in minutes)? 2

(d) GYANI Transporter is running 8 buses between two cities which are 90 kilometres apart. Seating capacity of each bus is 52 passengers but actual capacity is 80%. Calculate the total passenger kilometers for the month of May 2015. 2

(e) A television company manufactures several components in batches.

The following data relate to one component:

Annual demand	**32,000 units**
Set up cost/batch	**`120**
Annual rate of interest	**12%**
Cost of production per unit	**`16**

Calculate the Economic Batch Quantity (EBQ). 2

(f) Whether separate form CRA-2 is required to be filed by a company, having 2 or more different types of products covered under Cost Audit? 2

(g) What are the powers of the Cost Auditor under the Companies Act, 2013? 2

(h) What do you mean by the term "Oligopoly"? 2

(i) What is Marginal Revenue Product (MRP)? 2

(j) The Cost of a product of MENZ LTD. is given by function $C(q) = 200q - 10q^2 + \frac{1}{3}q^3$.

[Where C(q) stands for Cost function and q for output.]
Calculate, output at which average cost is equal to marginal cost. 2

Answer:

1. (a) Margin of Safety = Profit/(P/V) Ratio

Or, P/V Ratio = 80,000/4,00,000= 20%

$$\text{Break even sales} = \frac{\text{Fixed cost}}{\text{P/V Ratio}} = \frac{5,00,000}{0.20} = ₹25 \text{ lakhs}$$

(b) Total material cost variance:

Material price variance + Material usage variance = ₹2,200(FAV) + ₹1,000(Adv)

= ₹1,200(FAV).

Actual material cost = (1,100 ×8) = ₹8,800

Hence, the standard material cost of Actual Production:

= 8,800 + 1,200(FAV) = ₹10,000

(c) Return per hour = $\frac{\text{Selling price - Material cost}}{\text{Time of bottleneck resource}} \times 60$

$$= \frac{(45 - 18) \times 60}{x} = 270$$

$$\text{Or, } x = \frac{27 \times 60}{270} \text{ or } x = 6 \text{minutes}$$

(d) Total passengers kilometers: 80% of (8×90×2×52×31)

= 18,57,024 passengers – kms

(e) Economic batch Quantity:

$$= \sqrt{\frac{2 \times \text{Annual Demand} \times \text{Set up cost}}{\text{Rate of interest} \times \text{cost per unit}}}$$

$$= \sqrt{\frac{2 \times 32,000 \times 120}{12\% \text{ of } ₹16}} \qquad = \sqrt{\frac{76,80,000}{1.92}} = 2,000 \text{ units}$$

(f) Form CRA-2 is required to be filled providing details of the sectors/industries covered under cost Audit and details of cost Auditor. For companies appointing multiple cost auditors, only one single form CRA-2 is required to be filled.

(g) The powers of cost Auditor under sub-section (1) of section143 of the Companies Act, 2013 are as under.

- Right to access at all times to the books and accounts and vouchers of the company, whether kept at the registered office of the company or at any place.
- Entitled to require from the officers of the company such information and explanations as he may think necessary for the performance of his duties as an auditor.

(h) "Oligopoly" refers to the imperfect competition status, where there will be "Few Sellers". It is also referred to as "competition among few". In Oligopoly, there is an element of interdependence of the firms. The price and output of one firm will affect the other firms. In Oligopoly market, where there are only few firms, monopoly element may prevail in the market. Each firm controls a large share of the market.

(i) Marginal revenue Product (MRP)

It is the additional revenue the firm makes by selling the output contributed by one additional worker (i.e. the last worker) is sold. Thus it is a rupee measure of the additional output attributable to the effect of the additional worker. Note that MRP can be computed by multiplying MPP by the marginal revenue (MR).

Symbolically it can be written as:-

Therefore, $MRP_{Labour} = MPP_{Labour}$ X MR_{units}

(j) Marginal cost (MC) $= \frac{dc}{dq}(200q - 10q^2 + 1/3q^3)$

$= 200 - 20q + q^2$

Average cost (AC) $= (200q - 10q^2 + 1/3q^3)/q$

$= 200 - 10q + 1/3q^2$

If average cost = Marginal cost, then

$200 - 10q + 1/3q^2 = 200 - 20q + q^2$

Or, $10q - 2/3q^2 = 0$ or, $q(10 - 2/3q) = 0$ or $q = 0,15$

Output at which AC = MC is 15 units.

2. Answer any two questions (Carrying 20 Marks each):

(a) (i) VIBRANT LTD. a manufacturing Company produces one main Product A and two by-products M and N.

For the month of May, 2015, following details are available:

Total Cost upto separation point ₹2,20,000.

Product/By-Product	A	M	N
Cost after separation		₹ 35,000	₹ 24,000
No. of units produced	4,000	1,800	3,000
Selling price per unit	₹100	₹40	₹30
Estimated net profit as percentage to sales value		20%	30%
Estimated selling expenses as percentage to sales value	20%	15%	15%

There is no beginning or closing inventories.

Required:

Prepare statement showing:

(1) Allocation of joint cost; and

(2) Product wise and overall profitability of the company for May, 2015. 5+5=10

(ii) Normal capacity of SUVAN LTD. is 240000 Units per annum. Cost structure for the year ending 31st March, 2015 is as follows:

	₹
Direct material cost per unit	**25**
Direct labour cost per unit (subject to a minimum of ₹2,50,000 per month)	**20**
Overheads: Fixed	**18,00,000**
Variable per unit	**15**

Semi variable ₹9,60,000 per year upto 50% capacity and additional ₹3,00,000 for every 20% increase in capacity or part thereof.

In the year 2015-16 the company to be worked at 60% capacity for the first four months but it was expected that it would work at 80% capacity for the remaining 8 months. During the first four months, the selling price per unit will be fixed at ₹100.

Required:

What should be the price per unit in the remaining eight months to earn a total Profit of ₹43,80,000? 4+6=10

Answer:

2. (a) (i) **VIBRANT LTD.**

Apportionment of Joint costs at the point of separation:

Total cost upto point of separation					₹2,20,000
By product			M	N	
Less: Cost of by-products by working backward					
Sales realization	M ₹	N ₹	72000	90000	
Less: Net Profit [20% and 30% of sales]	14,400	27,000			
Less: Selling expenses (15% of sales)	10,800	13,500			
Less: Cost after separation	35,000	24,000	60,200	64,500	
Joint expenses			11,800	25,500	37,300
Joint cost of Product-A					1,82,700

Profit & Loss Statement for May 2015

Particulars	**A**	**M**	**N**	**Total**
No. of Units produced:	4,000	1,800	3,000	
	₹	₹	₹	
Sales (A)	4,00,000	72,000	90,000	5,62,000
Cost of Sales:				
Pre-separation cost	1,82,700	11,800	25,500	2,20,000
Post-separation cost	-	35,000	24,000	59,000
Cost of production	1,82,700	46,800	49,500	2,79,000
Selling expenses	80,000	10,800	13,500	1,04,300
Cost of Sales(B)	2,62,700	57,600	63,000	3,83,300
Profit (A- B)	1,37,300	14,400	27,000	1,78,700
Profit as a % Sales	34.32%	20%	30%	31.80%

2. (a) (ii)

SUVAN LTD.

Statement showing cost sheet for the year 2015 – 16

Particulars	First four months 48,000 units		Remaining eight months 1,28,000 units		Total 1,76,000 units
	Total (₹)	Per unit (₹)	Total (₹)	Per unit (₹)	(₹)
Direct material	12,00,000	25.00	32,00,000	25.00	44,00,000
Direct labour (subject to minimum ₹2,50,000 p.m.)	10,00,000	20.8333	25,60,000	20.00	35,60,000
Prime cost	22,00,000	45.8333	57,60,000	45.00	79,60,000
Overheads:					
Fixed (₹18,00,000 in the ratio 1: 2)	6,00,000	12.50	12,00,000	9.375	18,00,000
Variable @ ₹15 per unit	7,20,000	15.00	19,20,000	15.00	26,40,000
Semi variable- for first four months at 60% (9,60,000+3,00,000)×4/12 & for next 8 months at 80%(9,60,000+6,00,000)×8/12	4,20,000	8.750	10,40,000	8.125	14,60,000
Total cost	39,40,000	82.0833	9,92,000	77.50	1,38,60,000
Profit	8 ,60,000	17.9167	35,20,000	27.50	43,80,000
Sales	48,00,000	100.00	1,34,40,000	105.00	1,82,40,000

Hence, sale price per unit for 8 months will be ₹105.

2.

(b) (i) SHEENNA LTD., an appliance manufacturer, has always sold its product through wholesalers. Last year its sales were ₹ 20,00,000 and its net profit 10% of sales. As a result of the increase in appliance sales through departmental stores and e-commerce business establishment, the company is considering elimination of wholesalers and selling directly to retailers. It is estimated that this would result in a 40% drop in sales but net profit would be ₹1,80,000 due to the elimination of middlemen. Fixed expenses would increase from ₹ 2,00,000 to ₹ 3,00,000 owing to additional storage and logistics facilities.

As a Management Accountant you are required to find out:

(1) Wheather the proposed change would raise or lower the break-even point in rupees? By how much? Given reason.

(2) What would be the sale volume in rupees which would enable Sheena Ltd. to obtain as much profit as it made last year? 8+2=10

(ii) ANUKULA UDHYOG LTD. manufactures two types of products X and Y and overheads are absorbed on the basis of direct labour hours. The information about these products for the month of May, 2015 is as follows:

	Product X	Product Y
Production volume	2550 Units	3300 Units
Direct Material cost per unit	₹300	₹450
Direct Labour cost @ ₹ 60 per hour	₹240	₹360

During the above said period direct labour hours worked were 30,000 hours and production overheads were ₹16,87,500. Details of overheads according to identified three activities are as follows:

Activity	Overheads	Cost Driver level	
	₹	X	Y
Order processing	3,65,000	650 orders	350 orders
Machine processing	11,20,000	9500 machine hours	12,900 machine hours
Inspection	2,02,500	275 Inspections	400 Inspections

You are required to calculate the cost of production per unit for each product by using:

(1) Direct Labour Hour Rate for absorption of overhead; and

(2) Activity Based Costing (ABC) Method. **3+7=10**

Answer :

2. (b) (i)

SHEENNA LTD.

(1) **Old situation**

	₹	₹
Sales		20,00,000
Less: Contribution		
Fixed Expenses	2,00,000	
Profit – 10% of Sales	2,00,000	4,00,000
Marginal cost		16,00,000

$$\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100 = \frac{₹4,00,000}{₹20,00,000} \times 100 = 20\%$$

$$\text{Break even point (in rupees)} = \frac{\text{Fixed Expenses}}{\text{P/V Ratio}} = \frac{₹2,00,000}{\frac{20}{100}} = ₹10,00,000$$

New Situation

	₹
Last year's sales	20,00,000
Less: 40% drop	8,00,000
Future sales	12,00,000
Contribution:	
Fixed Expenses	3,00,000
Expected Profit	1,80,000
	4,80,000

$$\text{P/V Ratio} = \frac{\text{Contribution}}{\text{sales}} \times 100 = \frac{₹4,80,000 \times 100}{₹12,00,000} = 40\%$$

$$\text{Break Even Point} = \frac{\text{Fixed Expenses}}{\text{P/V Ratio}} = \frac{₹3,00,000}{\frac{40}{100}} = ₹7,50,000$$

Old break even point is ₹10,00,000 and new break even point is ₹7,50,000, so the proposed change would reduce break even point by ₹2,50,000

(2) **Calculation of sales volume** to obtain last year's profit of ₹2,00,000

$$\text{Sales} = \frac{\text{Fixed Expenses + Desired profit}}{\text{P/V Ratio}}$$

$$= \frac{₹3,00,000 + ₹2,00,000}{\frac{40}{100}} = ₹5,00,000 \times \frac{100}{40} = ₹12,50,000$$

2. (b) (ii)

ANUKULA UDHYOG LTD.

Working notes:

1. Direct labour hour rate $= \frac{₹16,87,500}{30,000} = ₹56.25$
2. Labour Hours worked on Product X = 240/60 = 4 hours and on Product Y = 360/60 = 6 hours
3. Calculation of cost driver rates:

Activity	Overheads (₹)	Cost driver level	Cost driver rate (₹)
Order processing	3,65,000	1,000 orders processed	3,65,000/1,000= ₹ 365 per order.
Machine Processing	11,20,000	22,400 machine hours	11,20,000/22,400 = ₹50 per machine hour
Inspection	2,02,500	675 inspections	2,02,500/675 = ₹300 per inspection

4. Calculation of cost absorbed overheads per unit.

	Product X ₹	Product Y ₹
On the basis of Direct Labour Hour rate		
X- (₹56.25 × 4) and Y – (56.25 ×6)	225	337.50
On the basis of Activity based costing:		
Overheads absorbed : - Order Processing		
(650 × 365) : (350 × 365)	2,37,250	1,27,750
Machine processing		
(9,500 × 50) : (12,900 × 50)	4,75,000	6,45,000
Inspections		
(275 × 300) : (400 × 300)	82,500	1,20,000
Total overhead cost	7,94,750	8,92,750
Units produced	2,550 units	3,300 units
Overhead cost per unit	**₹311.67**	**₹270.53**

(1 & 2) Calculation of cost of production per unit

Particulars	On the basis of Direct Labour hours rate		On the basis of ABC method	
	Product X (₹)	Product Y (₹)	Product X (₹)	Product Y (₹)
Direct material	300	450	300	450
Direct labour	240	360	240	360
Overheads	225	337.50	311.67	270.53
Cost of production	765	1147.50	851.67	1080.53

2.

(c) (i) ABOKASH LTD., operates a System of Standard Costing. The Company manufactures a Chemical Product by mixing three ingredients Chemical A, B and C and processes the same. The Standard Cost data for the product are as follows:

Chemical	Percentage of total input	Standard Cost per kg. (₹)
A	50%	40
B	30%	60
C	20%	95

Note: Loss during processing is 5% of input and this has no realizable value.

During the month of May,2015, 10,200kg. of finished product was obtained from the Inputs as per details given below:

Chemical Consumed	Quantity purchased and issued	Actual Cost (₹)
A	5200 kg.	2,34,000
B	3600 kg.	2,19,600
C	1700 kg.	1,58,100

You are required to calculate:

(1) Material Cost Variance
(2) Material Price Variance
(3) Material Mix Variance
(4) Material Yield Variance
(5) Material Usage Variance **2+2+2+2+2=10**

(ii) What do you mean by "Flexible Budgeting" **2**

(iii) ADAMAS LTD.; a newly established manufacturing company has an installed capacity to produce 1,00,000 units of a consumer product annually. However its practical capacity is only 90%. The actual capacity utilisation may be substantially lower, as the firm is new to the market and demand is uncertain. The following budget has been prepared for 90% capacity utilisation:

	Cost per unit ₹
Direct Materials	12
Direct Labour	8
Direct Expense	5
Production Overheads	10 (40% variable)
Administration Overheads	5 (100% fixed)
Selling and Distribution	6 (50% variable)

You are required to prepare Flexible Budgets of a Consumer product at 70% and 80% levels of capacity utilization giving clearly the Variable Cost, Fixed Cost and the Total Costs under various heads at all stated levels. **4+4=8**

Answer:

2. (c) (i)

ABOKASH LTD.
Standard cost of a Chemical Product

Chemical	Percentage of input	Quantity (kg)	Standard cost per kg (₹)	Total cost (₹)
A	50%	0.50	40	20

B	30%	0.30	60	18
C	20%	0.20	95	19
Total Input		1.00		57
Less: Loss on Processing (5%)		0.05		-
Output		0.95		57

Standard cost of a chemical Product = $\frac{₹57}{0.95}$ = ₹60

COMPUTATION OF VARIANCES:

(1) **Total material cost variances:**

=Standard cost of actual production (output) – actual material cost for production

= 10,200 × ₹60 – ₹(2,34,000 + 2,19,600 + 1,58,100)

= ₹6,12,000 – ₹6,11,700 = ₹300(FAV)

(2) **Materials Mix Variance:**

= (Std. Price – Actual) × Actual Qty consumed.

A:	[40 – (2,34,000/5,200)] × 5,200	₹26,000 (ADV)
B:	[60 – (2,19,600/3,600)] × 3,600	₹3,600 (ADV)
C:	[95 – (1,58,100/1,700)] × 1,700	₹ 3,400 (FAV)
		₹26,200 (ADV)

(3) **Material Mix Variance**:

= (Actual input in std. proportion – Actual input) × Std. cost of input/kg.

A:	[(0.50 ×10,500)- 5,200)] × ₹40	₹2,000 (FAV)
B:	[(0.30 ×10,500)- 3,600)] × ₹60	₹27,000 (ADV)
C:	[(0.20 ×10,500)- 1,700)] × ₹95	₹38,000 (FAV)
		₹13,000(FAV)

(4) **Yield Variance**

(Std. yield from actual input – Actual output) × Std. cost of finished product

= (10,500 × 0.95 – 10,200) × ₹60 = ₹13,500 (FAV)

(5) **Usage variance**:

Std. cost (output of Actual output – Std. cost of Actual Qty consumed.

= 10,200 × ₹60 - $\begin{pmatrix} 5,200 \times ₹40 \\ 3,600 \times ₹60 \\ 1,700 \times ₹95 \end{pmatrix}$ = ₹6,12,000 – ₹5,85,500

= ₹26,500 (FAV)

Usage variance= Mix Variance + Yield variance

= ₹13,000(FAV) + ₹13,500 (FAV) = ₹26,500 (FAV)

Total material cost variance:

Material Price Variance + Material usage Variance

= ₹26,200 (ADV) + ₹26,500 (FAV)

= ₹300 (FAV).

2. (c) (ii)

Flexible budget is a budget which recognizing different cost behavior pattern, is

designed to change as the volume of output changes. It is thus designed to furnish budget cost at any level of activity actually attained. Actually a flexible budget constitutes a series of fixed budgets i.e. one fixed budget for each level of activity. Separation of costs into variable and fixed is a must for preparation of flexible budgets.

2. (c) (iii)

1. **Variance Overheads per unit:**

   Production overhead: 40% of ₹10 = ₹4.00

   Selling & Distribution overhead: 50% of ₹6 = ₹3.00

2. **Fixed Overheads:**

   Practical capacity is 90% of 1,00,000 = 90,000 units

3. **Production overhead:** (60% of ₹10×90,000) = ₹90,000 × ₹6 = ₹5,40,000
4. **Administration overhead**: (100% of ₹5 ×90,000) = ₹ (90,000 × 5) = ₹4,50,000
5. **Selling and Distribution overhead:** (50% of ₹6 ×90,000) = ₹ (90,000 × 3) = ₹2,70,000

Flexible budget of a consumer product

Capacity Production (units)	**70%**		**80%**	
	70,000		**80,000**	
	Total cost (₹ in Lakhs)	Cost per unit (₹)	Total cost (₹ in Lakhs)	Cost per unit (₹)
Direct Costs:				
Direct materials	8.40	12.00	9.60	12.00
Direct labour	5.60	8.00	6.40	8.00
Direct expenses	3.50	5.00	4.00	5.00
Variable overheads				
Production overhead	2.80	4.00	3.20	4.00
Selling and distribution Overhead (Ref.W.N-1)	2.10	3.00	2.40	3.00
Total Variable Cost (A)	22.40	32.00	25.60	32.00
Fixed overheads:				
Production overhead	5.40	7.71	5.40	6.75
Administration overhead	4.50	6.43	4.50	5.62
Selling and Distribution Overhead (Ref. W.N.2)	2.70	3.86	2.70	3.38
Total fixed cost (B)	12.60	18.00	12.60	15.75
Total cost (A+B)	35.00		38.20	
Cost per unit (₹)		50.00		47.75

3. Answer any two questions (Carrying 8 Marks each):

(a) (i) What is the procedure for appointment of cost auditor under the Companies Act, 2013? 6

(ii) Whether Cost Audit Report has to be prepared plantwise or for the Company as whole? 2

Answer:

3. (a) (i)

The cost auditor is to be appointed by the Board of Directors on the recommendation of the Audit Committee, where the company is required to have an Audit Committee. The cost auditor proposed to be appointed is required to give a letter of consent to the Board of Directors. The company shall inform the cost auditor concerned of his or its appointment as such and file a notice of such appointment with the Central Government within a period of thirty days of the Board meeting in which such appointment is made or

within a period of one hundred and eighty days of the commencement of the financial year, whichever is earlier, through electronic mode, in form CRA-2, along with the fee as specified in Companies (Registration Offices and Fees) Rules, 2014.

Any casual vacancy in the office of a cost auditor, whether due to resignation, death or removal, shall be filled by the Board of Directors within thirty days of occurrence of such vacancy and the company shall inform the Central Government in Form CRA-2 within thirty days of such appointment of cost auditor.

3. (a) (ii)

Cost Audit Report is to be prepared for the company as a whole in respect of the product/activity - coming under cost Audit.

3. (b) (i) Who can be appointed as a Cost Auditor? 3

(ii) Under what circumstances will the appointment of Cost Auditor for Conducting Cost Audit be made in firm's name?

Who will authenticate such report and how? 3+2=5

Answer:

3. (b) (i)

Only a Cost Accountant, as defined under section 2(28) of the companies Act, 2013, can be appointed as a cost auditor.

Clause (b) of sub-section (1) of section 2 of the Cost and Works Accountants Act.1959 defines "Cost Account". It means a Cost Account who holds a valid certificate of practice under sub-section (1) of section 6 of the Cost and Works Accountants Act, 1959 and is in whole-time practice. Cost Accountant includes a Firm of Cost Accountants and a LLP of cost accountants.

3. (b) (ii)

Appointment of cost Auditor under a firm's name will be subject to the following conditions: -

(a) All the partners of the firm are full time Cost Accounting Practitioners within the Meaning of Sec 6 and Sec 7 of the Cost and Works Accountants Act,1959

(b) The firm must have constituted with the previous Approval of central Government or of the Central Council of ICWAI as per amended Regulation 113 of the Cost and Works Accountants Act, 1959.

The cost audit Report shall be signed by any one Partner of the firm responsible for the conduct in his own hand for and on behalf of the firm. In any case the report should not be signed by merely offering the firm's name.

3. (c) (i) What are the Social Objectives of Cost Audit? 5

(ii) What is the meaning of "Turnover" in relation to the companies(Cost Records and Audit) Rules, 2014? 3

Answer:

3. (c) (i)

Among the social objectives of cost audit, the following deserve special attention:

1) Facilitation in fixation of reasonable price of goods and service produced by the enterprise.
2) Improvement in productivity of human, physical and financial resources of the enterprise
3) Availability of audited cost data as regards contracts containing escalation clauses.

4) Channelising of the enterprise resources to most optimum, productive and profitable areas.
5) Facilitation in settlement of bills in the case of cost-plus contracts entered into by the Government.
6) Pinpointing areas of inefficiency and mismanagement, if any, for the benefit of shareholders, consumers etc. such that necessary corrective action could be taken in time.

3. (c) (ii)

Sub-section 91 of Section 2 of the Companies Act, 2013 defines "turnover" as "the aggregate value of the realization of amount made from the sale, supply or distribution of goods or on account of services rendered, or both, by the company during a financial year. For the purposes of these Rules, "Turnover" means gross turnover made by the company from the sale or supply of all products or services during the financial year. It includes any turnover from job work or loan license operations but exclude duties and taxes. Export benefit received should be treated as a part of sales.

4. Answer any three questions (Carrying 8 Marks each):

(a) (i) What are the exceptions to the "Law of Demand"? 4

(ii) The demand and supply function under perfect competition are

$y = 16-x^2$ and $y = 2(x^2 +2)$ respectively.

Find:

(1) The Market Price;

(2) Producer's Surplus. 2+2=4

Answer:

4. (a) (i)

Exceptions to the Law of Demand:

The following are the exceptions to the Law of demand:

i. **Griffin paradox:** According to Griffin, even through the price, for necessary goods rise, the demand for them will not decrease. These goods are called "Griffin Goods'

ii. **Prestigious goods:** The law of demand will not operate in case of prestige goods like diamonds, cars etc.. The demand for these does not decrease with the rise in the price, as these goods are attached with prestige.

iii. **Speculative Business:** The law of demand does not operate in case of the speculative business. If people think that the prices of goods increase in the future, now they will buy more units of that commodity. This is against the law of demand.

iv. **Trade Cycles:** The law of demand does not operate in periods of trade cycles. During the prosperity period, people may buy more goods at higher prices. In periods of depression, people buy fewer goods even through the prices are less.

v. **Ignorance of the consumer:** The law of demand is not applicable in case of the ignorant consumers. Buy ignorance, people think that high priced goods are qualitative goods. Therefore the consumers would buy the goods even at high price.

4. (a) (ii)

(1) Under perfect competition market price is: demand = supply i. e.

$16- x^2 – 2x^2 – 4 = 0$

Or, $- 3x^2 + 12 = 0$

Or, $- 3x^2 = -12$

$\therefore x^2 = 12/3$

$x = \sqrt{\frac{12}{3}} = 2$ units

$Y = 2x^2 + 4 = 12$ Market price = 12

(2) Producer's Surplus $= 2 \times 12 - \int_0^2 2(x^2+2)dx$

$= 24 - {}^{2}_{0}\left[\frac{2x^3}{3}+4x\right]$

$= 24 - \frac{16}{3} - 8 - 0$

$= 24 - \frac{16}{3} - 8$

$= 10\ ^{2/3}$

4. (b) (i) What are the factors involved in Demand Forecasting? 5

(ii) The Cost of a product of KRISHAN LTD. is given by the function

$C = 300x – 10x^2 + \frac{1}{3}x^3$

Where C stands for cost and x for output.
Calculate the output at which Marginal Cost is Minimum. 3

Answer:

4. (b) (i)

The factors involved in Demand Forecasting are enumerated below:

1. **Time factor:** Forecasting may be done for short-term or long-term. Short-term forecasting is generally taken for one year while long-term forecasting covering a period of more than 1 year.
2. **Level factor:** Demand forecasting may be undertaken at three different levels:
   a. Macro level: It is concerned with business conditions over the whole economy.
   b. Industry level: Prepared by different industries.
   c. Firm-level: Firm-level forecasting is the most important from managerial view point.
3. **General or Specific purpose factor**: The firm may find either general or specific forecasting or both useful according to its requirement.
4. **Product:** Forecasting varies type of product i.e., new product or existing product or well established product.
5. **Nature of the product:** Goods can be classified into

   (i) consumer goods and (ii) producer goods.

   Demand for a product will be mainly dependent on nature of the product. Forecasting methods for producer goods and consumer goods will be different accordingly.

6. **Competition.** While making forecasting, market situation and the product position in particular market should be analyzed.
7. **Consumer Behaviour:** What people think about the future, their own personal prospects and about products and brands are vital factors for firm and industry.

4. (b) (ii)

In the present case, the marginal cost is given by

$$MC = \frac{dC}{dx} = \frac{d}{dx}(300x - 10x^2 + \frac{1}{3}x^3) = 300 - 20x + x^2$$

$$\frac{dMC}{dx} = -20 + 2x \text{ and } \frac{dMC}{dx} = 0 \text{ gives } x = 10.$$

$$\frac{d^2MC}{dx^2} = 2 = +\text{ve for } x = 10.$$

Thus, the marginal cost is minimum when the output is 10 units.

4. (c) (i) What are the objectives of Fiscal Policy in India? 4

(ii) The total Profit y in rupees of MEDICOS PHARM LTD., a drug company from the manufacture under sale of x drug bottles in given by y = $-\frac{x^2}{400} + 2x - 80$.

Required:

(1) How many drug bottles must the Company sell to achieve the maximum profit?

(2) What is the Profit per drug bottle when this maximum is achieved? 3+1=4

Answer:

4. (c) (i)

Objective of Fiscal Policy in India:

Fiscal policy or budgetary policy in India is designed to achieve the following objectives:

i. To achieve rapid economic development,

ii. To reduce concentration of income and wealth so as to create socialistic pattern of society.

iii. To achieve plan targets of growth and employment

iv. To reduce regional imbalances by providing incentive for backward area location of industries, and

v. To modify industrial structure according to plan frame work by encouraging / discouraging investments in certain industries.

4. (c) (ii)

(i) $y = \frac{-x^2}{400} + 2x - 80$ $\quad\therefore \frac{dy}{dx} = \frac{-2x}{400} + 2$

Putting $\frac{dy}{dx} = 0$ and solving for x, $\frac{-x}{400} + 1 = 0$

Or, $\frac{x}{400}=1$ $\therefore$ x = 400.

Also $\frac{d^2y}{dx^2}=\frac{-2}{400}$ = -ve $\therefore$ y is maximum when x = 400.

$\therefore$ To get maximum profit, the company must sell 400 drug bottles.

(ii) Maximum total profit = Value of y when x = 400.

$$= \frac{-1,60,000}{400} + 800 - 80 = ₹320$$

Therefore, profit per drug bottle = ₹ $\frac{320}{400}$ = 80 paises

4. (d) What are the Pricing policies of a firm for introduction stage of a new product? 8

Answer:

4. (d)

PRICING OF A NEW PRODUCT

Basically, the pricing policy of a new product is the same as that for an established product - viz., the price must cover the full costs in the long run and direct costs or prime costs in the short period.

There are two alternative pricing policies which a firm can adopt for introduction stage of a new product such as (a) Skimming price policy and (b) Penetration pricing policy.

(a) <u>Skimming Price Policy</u>:

When the product is new but with a high degree of consumer acceptability, the firm may decide to charge a high mark up and, therefore, charge a high price. The system of charging high prices for new products is known as price skimming for the object is to "skim the cream" from the market. There are many reasons for adopting a high mark-up and, therefore, high initial price:

(i) The demand for the new product is relatively inelastic. The high prices will not stop the new consumers from demanding the product. The new product, novelty, commands a better price. Above all, in the initial stage, there is hence cross elasticity of demand is low.

(ii) If life of the product promises to be a short one, the management may fix a high price so that it can get as much profit as possible and, in as short a period as possible.

(iii) Such an initially high price is also suitable if the firm can divide the market into different segments based on different elasticities. The firm can introduce a cheaper model in the market with lower elasticity,

(iv) High initial price may also be needed in those cases where there is heavy investment of capital and when the costs of introducing a new product are high. The initial price of a transistor radio was ₹500 or more (now ₹50 or even less); electronic calculators used to cost ₹1,000 or more, they are now available for ₹100 or so.

(b) Penetration Price Policy:

Instead of setting a high price, the firm may set a low price for a new product by

adding a low mark-up to the full cost. This is done to penetrate the market as quickly as possible. The assumptions behind the low penetration price policy are:

(a) The new product is being introduced in a market which is already served by well-known brands. A low price is necessary to attract gradually consumers who are already accustomed to other brands.

(b) The low price will help to maximize the sales of the product even in the short period.

(c) The low price is set in the market to prevent the entry of new products.

Penetration price policy is preferred to skimming price under three conditions:

In the first place, skimming price offering a high margin will attract many rivals to enter the market. With the entry of powerful rivals into the market, competition will be intensified, price will fall and profits will be competed away in the long run. A firm will prefer a low penetration price if it fears the entry of powerful rivals with plenty of capital and new technology. For a low penetration price, based on extremely low mark-up will be least profitable and potential competitors will not be induced to enter the market.

Secondly, a firm will prefer low penetration price strategy if product differentiation is low and if rival firms can easily imitate the product. In such a case, the objective of the firm to fix low price is to establish a strong market based and build goodwill among consumers and strong consumer loyalty.

Finally, a firm may anticipate that its main product may generate continuing demand for the complementary items. In such a case, the firm will follow penetration pricing for its new product, so that the product as well as its complements will get a wider market.