Answer to PTP_Final_Syllabus 2008_Jun2014_Set 2

Paper- 15: MANAGEMENT ACCOUNTING- ENTERPRISE PERFORMANCE MANAGEMENT

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

The figures in the margin on the right side indicate full marks.
Attempt Question No. 1 (carrying 25 marks), which is compulsory and
Any five more questions (each carrying 15 marks) from the rest.

1.

a) State whether the following statement are "True" or "False". [5]

i) A company's approach to make or buy decision depends on whether the company is operating at or below normal volumes.

ii) Life Cycle Costing is a technique to establish the total cost of ownership.

iii) Drum is the constraint and therefore sets the pace for the entire system.

iv) Theory Y style of Management is a highly autocratic style.

v) EVA encourages short-term performance.

b) Choose the most appropriate one from the stated options and write it down. [5×2=10]

i) ABC Ltd., has current PBIT of ₹ 19.20 Cr. on total assets of ₹ 96 Cr. The company proposes to increase assets by ₹ 24 Cr., which is estimated to increase operating profit before Depreciation by ₹ 8.4 Cr. and a net increase in depreciation by ₹ 4.8 Cr. This will result in ROI:

A. To decrease by 1%
B. To increase by 1%
C. To remain the same
D. None of these.

ii) A particular job requires 800 kgs of material-P 500 kgs of the particular material is currently in stock. The original price of the material-P was ₹ 300 but current resale value of the same has been determined as ₹ 200. If the current replacement price of the material-P is ₹ 0.80 per kg., the relevant cost of the material-P required for the job would be :

A. ₹ 640
B. ₹ 440
C. ₹ 300
D. None of these.

iii) In two consecutive periods, sales and profits were ₹1,60,000 and ₹8,000 respectively in the first period and ₹ 1,80,000 and ₹14,000 respectively during the second period. If there is no change in fixed cost between the two periods, then what would be profit if sales are ₹ 2,00,000?

A. ₹16,000
B. ₹18,000
C. ₹ 20,000
D. ₹ 22,000

iv) A company has fixed costs of ₹6, 00,000 per annum. It manufactures a single product which it sells for ₹200 per unit. Its contribution to sales ratio is 40%. Its break-even point in units is:

A. 7,500 units
B. 8,000 units
C. 3,000 units

D. 1,500 units

v) The budgeted fixed overheads for a budgeted production of 10,000 units is ₹20,000. For a certain period the actual production was 11,000 units and actual expenditure came to ₹24,000. Then the volume variance is
A. 4,000(A)
B. 2,000 (F)
C. 2,000 (A)
D. None of these.

c) Define the following terms in not more than two or three lines. [5]
i) Zero defects
ii) The Shewhart Cycle
iii) Cost Driver
iv) Talent Drain
v) V in VAT Analysis

d) Write out what the following abbreviations stands for in the context of Enterprise Performance Management. [5]
i) APQC
ii) DPMO
iii) WAITRO
iv) USCF
v) ECE

Answer:

a)

i) **False**. A company's approach to make or buy decision involves an analysis of avoidable costs.
ii) **True.** Life Cycle Costing is a technique to establish the total cost of ownership.
iii) **True.** Drum is the constraint and therefore sets the pace for the entire system.
iv) **False.** Theory X is a highly autocratic style of management.
v) **True.** Short-tem performance is encouraged and measured by EVA.

b)

i) **A.** —to decrease by 1%

	ROI without Investment		ROI with Investment
PBIT (₹ Cr)	19.20	(+8.4 -4.8)	22.80
Total Assets (₹ Cr)	96.00	(+24.00)	120.00
ROI	20%		19%
			(i,e., 1% decrease)

ii) **B.** — ₹ 440.
500 kgs of material in stock at resale value = ₹ 200
Balance 300 kgs. of material at current price of ₹ 0.80 = ₹ 240
Relevant Cost of the material = ₹ 440

iii) **C-** ₹20,000
Sales = 1,80,000 – 1,60,000 = 20,000
Profit = 14,000 – 8,000 = 6,000

$$\text{P/V Ratio} = \frac{\Delta \text{ in Proift}}{\Delta \text{ in Sales}} = \frac{6,000}{20,000} = 30\%$$

Fixed Cost = Contribution – Profit
Fixed Cost = 30% of 1,60,000 – 8,000
= 48,000 – 8,000
= 40,000

$$\text{Sales} = \frac{\text{Fixed Cost} + \text{Required Profit}}{30\%}$$

$$2{,}00{,}000 = \frac{40000 + \text{Required Profit}}{30\%}$$

60,000 = 40,000 + Required Profit
Required Profit = 60,000 – 40,000 = 20,000

iv) **A -** 7,500 units
Contribution =₹200× 40% =₹80
Therefore Break Even Point (units) = 6,00,000 ÷ 80 =7,500 units.

v) **B** -₹2,000 (F)
Volume Variance = (Budgeted Prodn. – Actual prodn.) × Std. Rate
= (10,000-11,000)× 20,000/10,000= ₹2,000 (F)

c)

i) Zero Defects does not mean mistakes never happen, rather that there is not allowable number of errors built into a product or process and that you get it right first time.

ii) The Shewhart Cycle:
PLAN- Establish the objectives and processes necessary to delivery results in accordance with the specifications.
DO- Implement the process
CHECK- Monitor and evaluate the processes and results against objectives and specifications and report the outcome.
ACT- Apply actions to the outcome for necessary improvement.

iii) Cost Driver, is the one that is selected and used as a basis with a view to assigning costs attached/attributed to an activity cost centre to cost objects-a term commonly used in ABC costing.

iv) The Talent Drain is the second potential problem in succession planning. Because upper management must identify a small group of managers to receive training and development promotion, those managers who are not assigned o development activities may feel overlooked and leave the organizations. This turnover may reduce the number of talented managers of the lower and middle lower levels of the organization. They may work for a competing firm or start their own business, thus creating increased competition for their former company.

v) V in VAT Analysis a logical structure (many-to-one-flow) starts with one or few raw materials and the product expands into a number of different products as it flows through its routings.

d)

i) APQC-American Productivity and Quality Center
ii) DPMO- Defects per Million Opportunities

iii) WAITRO- World Association of Industrial and Technological Research Organization.
iv) USCF- Upside Supply Chain Flexibility.
v) ECE- Effect Cause Effect Diagram.

2.

a) List out the ten principles of Lean Supply Chains. [7]

b) K Company has the capacity of production of 80,000 units and presently sells 20,000 units at ₹ 100 each. The demand is sensitive to Selling Price and it has been observed that for every reduction of ₹ 10 in Selling Price, the demand is doubled.

Required:

i) What should be the Target Cost at full capacity, it Profit Margin on Sale is 25%?
ii) What should be the cost reduction scheme if at present 40% of Cost is variable, with same % of profit?
iii) If Rate of Return desired is 16%, what will be the maximum investment at full capacity? [2+4+2=8]

Answer:

a) The ten principles of Lean Chains are as follows:

i) Organize and synchronize around logical and complete processes rather than functions.
ii) Create a continuous flow of the right materials throughout the supply chain.
iii) Move to making product to customer demand rather than finished goods.
iv) Eliminate non-value added steps throughout the supply chain.
v) Reduce order-to-delivery lead times to quicker than customer requirements.
vi) Mistake-proof processes to do it right the first time and every time.
vii) Create on optimal high velocity flow of high quality, relevant and necessary information throughout the supply chain.
viii) Store material at the point of use.
ix) Make your customers and suppliers your real partners.
x) Develop a team-based organization, provide the necessary support and empower them to make decision that affects their work.

b)

i) Target Cost at Full Capacity

Selling Price per unit	₹ 100	₹ 90	₹ 80
Demand	20,000 units	40,000 units	80,000 units = Full Capacity

Hence, Target Cost at Full capacity = Sale price less Profit Margin = ₹ 80 less 25% thereon = ₹ 60 p.u.

ii) Determination of Target Cost reduction

(a)	Since Present Price is ₹ 100 p.u. and Profit is 25% thereon, Present Cost p.u. = ₹ 75, of which 40% is variable. So, Fixed Cost is 60% of ₹ 75 = ₹ 45 p.u. so, Total Fixed Cost =	45 x 80,000 = ₹ 36 Lakhs
(b)	Variable Cost at Full Capacity = (40% of ₹ 75 p.u.) x 80,000 units =	= ₹ 24 Lakhs
(c)	Estimated Cost at Full Capacity = Fixed Cost (constant at all levels) + Variable Cost (a+b)	₹ 60 Lakhs
(d)	Target Cost at Full Capacity = ₹ 60 p.u. for 80,000 units =	₹ 48 Lakhs
(e)	Cost Reduction Target / Scheme = Estimated Cost less Target Cost =	₹ 12 Lakhs

	(c – d)	

iii) Computation of Investment required

(a)	Profit at full capacity = 25% of ₹ 80 = ₹ 20 p.u. x 80,000 units =	₹ 16 Lakhs
(b)	Since ROCE desired is 16%, Maximum Required Investment = ₹16 lakhs / 16%	₹ 100 Lakhs

3.

a) Indo Gulf Fertilizers Ltd. supports the concept of the tero-technology of Life Cycle Costing for new investment decisions covering its engineering activities. The company is to replace a number of its machines and the Production Manager is to run between the "X" machine, a more expensive machine with a life of 12 years, and the "W" machine with an estimated life of 6 years. If the "W" machine chosen it is likely that it would be replaced at the end of 6 years by another "W" machine. The pattern of maintenance and running costs differs between the two types of machine and relevant data are shown below :

Particulars	**X(₹)**	**W(₹)**
Purchase price	**19,000**	**13,000**
Trade-in-value	**3,000**	**3,000**
Annual repair costs	**2,000**	**2,600**
Overhead costs (in 8th & 4th year respectively)	**4,000**	**2,000**
Estimated financing costs averaged over machine life (p.a.)	**10%**	**10%**

You are required to recommend, with supporting figures, which machine to purchase, stating any assumptions made. [10]

b) The impact of control system on Human behavior can be better explained by Budgetary Control. Explain. [5]

Answer:

a)

Machine X – Life 12 years

	Year	Cost (₹)	Discount factor (₹)	Discounted cost
Purchase price	0	19,000	1.00	19,000
Overhead cost	8	4,000	0.47	1,880
Trade-in-value	12	(3,000)	0.32	(960)
Annual repair cost	1-12	2,000	6.81	13,620
				33,540

Annualized equivalent = ₹ 33,540/ 6.81 = ₹ 4,925

Machine W – Life 6 years

	Year	Cost (₹)	Discount factor	Discounted cost
Purchase price	0	13,000	1.00	13,000
Overhead cost	4	2,000	0.68	1,360
Trade-in-value	6	(3,000)	0.56	(1680)
Annual repair cost	1-6	2,600	4.36	11,336

				24,016

Annualised equivalent = ₹ 24,016/ 4.36 = ₹ 5,508
Recommendation – Purchase Machine "X"
Assumptions:

i) Same performance, capacity and speed
ii) No inflation
iii) 12 year-estimates are as accurate as 6-years estimates
iv) Cash flow at the year end.

b) Control system exerts a considerable influence on an individual's behavior in an organization. The impact of Control System on human behavior is better explained with the aid of examining budgetary control.
The Budget Process affects behavior in three ways:

i) Budget formulation: a bottom-up approach, instead of top-down, involving employees, makes them committed towards meeting the budget.
ii) Fixing Budgets: Sales, Production and other targets that are determined / fixed are challenging, so as to bring out best of individual's efforts.
iii) Performance evaluation: this should be done in a constructive manner rather than in a vindictive manner. To ensure proper accountability, an appropriate evaluation with a positive outlook is a necessity.

Budgetary exercise is not simply a tool for planning in control but more importantly a means of achieving coordination between different departments of an enterprise. Cooperation and Coordination between employees and the management and among the employees themselves through the Budgetary Control System i.e., involving all in the process, will yield better results.

4.

a) Excellent, a Scientific Equipment manufacturing company is engaged in producing different types of high class equipment for use in science laboratories. The company has two different assembly lines to produce its most popular product. The processing time for each of the assembly lines is regarded as a random variable and is described by the following distributions:

Processing time (minutes)	Assembly A_1	Assembly A_2
20	0.20	0.10
21	0.40	0.15
22	0.20	0.40
23	0.15	0.25
24	0.05	0.10

Using the following random numbers, generate data on the process times for 15 units of the item and compute the expected process time for the product.

3441, 7674, 4349, 4383, 8311, 1519, 0236, 4594, 1554, 0575, 8900, 8008, 2874, 2434, 0993

For the purpose, read the numbers horizontally, taking the first two digits for the processing time on assembly A_1 and the last two digits for processing time on assembly A_2. [10+2]

b) What is the 5-S Concept? [3]

Answer:

a) Table 1: Random Number Coding for Process Times

Time (mts.)	Assembly A_1			Assembly A_2		
	Prob.	Cum. Prob.	RN Interval	Prob.	Cum. Prob.	RN Interval
20	0.20	0.20	00-19	0.10	0.10	00-09
21	0.40	0.60	20-59	0.15	0.25	10-21
22	0.20	0.80	60-79	0.40	0.65	25-64
23	0.15	0.95	80-94	0.25	0.90	65-89
24	0.05	1.00	95-99	0.10	1.00	90-99

The random numbers for the first unit are 34 and 41 respectively for the assemblies, A_1 and A_2. From the Table 2, we observe that the times corresponding to these are 22 and 21 minutes respectively. Thus, the total time required for the unit is 43 minutes. In the same way, the times for the other 14 units are determined and shown in the last column of the table.

Table 2: Simulation Worksheet

Unit	Assembly A_2		Assembly A_1		Total time (Mts.)
	R. Number	Time	R. Number	Time	
1	41	22	34	21	43
2	74	23	76	22	45
3	49	22	43	21	43
4	83	23	43	21	44
5	11	21	83	23	44
6	19	21	15	20	41
7	36	22	02	20	42
8	94	24	45	21	45
9	54	22	15	20	42
10	75	23	05	20	43
11	00	20	89	23	43
12	08	20	80	23	43
13	74	23	28	21	44
14	34	22	24	21	43
15	93	24	09	20	44
				Expected time = 649/15 = 43.27	

b) The 5-S Concept is an integrated concept for house-keeping or workplace management evolved by the Japanese. The 5-Ss are:

i. SEIRI - Organization or Re-organization.
ii. SEITON – Neatness
iii. SEISO – Cleaning
iv. SEIKETSU – Standardization
v. SHITSUKE - Discipline.

While 'SEIRI helps us to decide what are the items needed, "SEITON" involves safety and productivity. 'SEISO' means to take up the job of cleaning, while 'SEIKETSU' is nothing but standardization. 'SHITSUKE' stands for disciplining the system.

5.

a) F Manufacturing Ltd., uses the three variances method to analyze the manufacturing overhead variances. Manufacturing overhead variances for the fiscal year just ended

were computed as follows:
Spending - ₹ 86,000 Adverse
Efficiency- ₹ 36,000 Favorable
Volume - ₹ 80,000 Favorable
The manufacturing overhead application rate for the year was ₹ 160 per machine hour of which ₹ 60 per machine hour was the variable component. The year-end balance in the Manufacturing Overhead Control Account was ₹ 16,50,000 and the standard machine hours for the year were 11,300.
From the above data compute: (i) Budgeted machine hours, (ii) Actual machine hours, (iii) Applied manufacturing overhead, (iv) Total amount of fixed overhead cost. [2.5 × 4]

b) What are the benefits of Kaizen Procedure? [5]

Answer:

a)

(i)Calculation of Budgeted Machine Hours

Volume variance = ₹ 80,000 (F) given

Volume variance = Std. fixed overhead rate per hour (Std. machine hours for actual output - Budgeted machine hours for actual output)

₹ 80000(F) = ₹ 100 (11,300 - x)

800 = 11,300 - x

x = 11,300 - 800

x = 10,500

∴ Budgeted Machine hours for actual output = 10,500 hours

(ii) Actual Machine Hours

Efficiency variance = ₹ 36,000 (F) (given)

Efficiency variance = Std. variable overhead rate per hour (Std. hours for actual output - Actual hours for actual output)

₹ 36000(F) = ₹ 60 (11300 hours - x)

600 = 11300 -x

x = 10,700

∴ Actual Machine hours = 10,700 hours

(iii) Applied Manufacturing overhead

= Actual overhead incurred + Total variance

= ₹ 16,50,000 + ₹ 30,000 = ₹ 16,80,000

Working Notes Total variance = Spending variance + Efficiency variance + Volume variance

= ₹ 86,000 (A) + ₹ 36,000 (F) + ₹ 80,000 (F) = ₹ 30,000 (F)

(iv)Total amount of Fixed overhead cost

Spending variance = Budget for actual hours - Actual factory overhead incurred

₹ 86,000 (A) =(10,700 hours × ₹ 60 + Total amount of fixed overhead) - ₹ 16,50,000

₹ 86,000 (A) =₹ 6,42,000 + Total amount of fixed overhead (budgeted) - ₹ 16,50,000

Total amount of fixed overhead = ₹ 10,08,000 - ₹ 86,000 = ₹ 9,22,000.

b) Due to proper implementation of Kaizen Procedure, the following Tangible and Intangible benefits can be made available to the organizations :

Tangible Benefits – Sum total of small improvements contributed by all levels of employees can results in a big pile of improvements viz. Reduced Time/ Rejection/ Energy consumption etc. along with improved quality.

Intangible Benefits – There are many intangible benefits that go a long way in developing participative culture. These are:

- As the stress is on number (of small step improvements) it can be a single motivating factor for individual employees. They take pride in increasing this number.
- As these are small step improvements calling for very negligible investment, it is virtually risk free.
- It results in better team work due to certain principles of spiral thinking involved in basic philosophy.
- With increased emphasis on waste elimination it gives the employees a sense of belonging towards organization while building a culture of loyalty.
- With emphasis on energy savings it helps the society as a whole in conserving improvement resources like electricity, fuel etc.
- It results in change in attitude of work force from hostile to loyal, from destructive to constructive.

6.

a) Write the difference between Theory X vs. Theory Y. [3]

b) The Famous Oil Corporation of India is considering whether to go for an off-shore oil drilling contract to be awarded in Kolkata High. If they bid, value would be Rs. 600 million with a 65% change of gaining the contract. They may set up a new drilling operation or move already existing operation, which has proved successful, to the new site. The probability of success and expected returns are as follows:

Outcome	New Drilling Operation		Existing Operation	
	Probability	Expected Revenue (₹ Million)	Probability	Expected Revenue (₹ Million)
Success	0.75	800	0.85	700
Failure	0.25	200	0.15	350

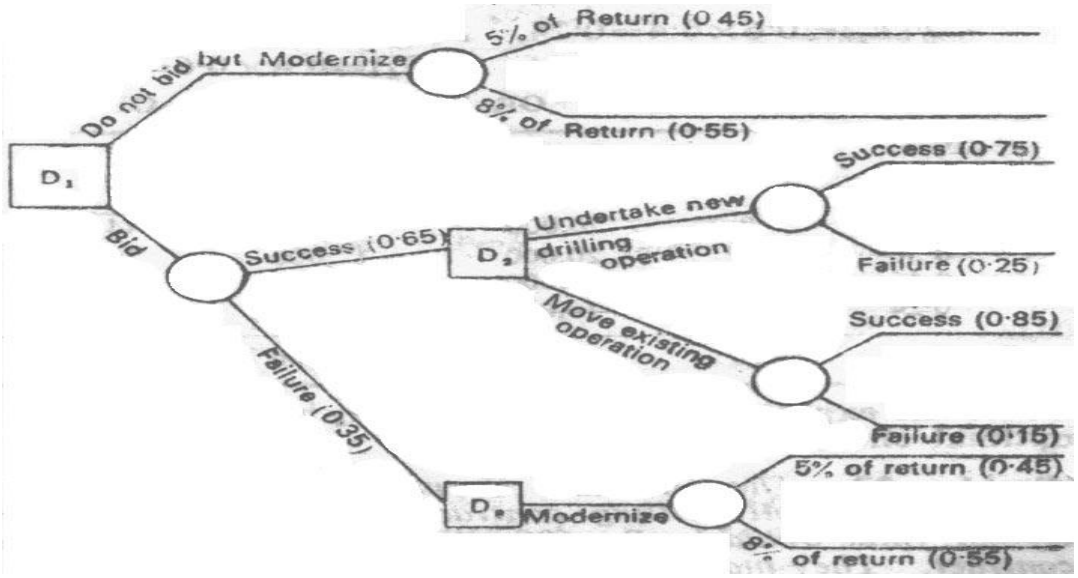
If the Corporation do not bid or lose the contract, they can use the Rs. 600 million to modernize their operation. This would result in a return of either 5% or 8% on the sum invested with probabilities 0.45 and 0.55.
(Assume that all costs and revenue have been discounted to present value)
(i) Construct a decision tree for the problem showing clearly the course of action.
(ii) By applying an appropriate decision criterion recommended whether or not the Oil India Corporation should bit the contract. [5+7]

Answer:

a) Theory X vs. Theory Y

Theory-X (old classic theory)	Theory – Y (Doughlas McGergor theory)
Highly autocratic	Highly participative style
Believes the men hates to work	Work will be like play/sleep, provided congenial working environment is created.
One has to hired/forced/fired to exact work	Self control is many times more powerful than external control.

b)



Evaluation of decision points

Decision point	Outcome	Probability	Conditional value (₹)	Expected value (₹)
D_1 (i) Modernise	5% of return 8% of return	0.45 0.55	600 x 0.05 600 x 0.08	13.5 26.4
				39.9
D_2 (i) Undertake new drilling operation	Success Failure	0.75 0.25	800 200	600 50
				650
(ii) More existing operation	Success Failure	0.85 0.15	700 350	595 52.5
				647.5
D_1 (i) Do not bid but modernize	5% of return 8% of return	0.45 0.55	600 x 0.05 600 x 0.08	13.5 26.4
				39.9
(ii) Bid	Success Failure	0.65 0.35	650 + 647.5 39.9	843.375 13.965
				857.34
			Less:	600.00
			Total	257.34

Since the outcome is positive, the decision, may be undertaken.

7. Best Ltd. has two manufacturing departments organised into separate profit centres known as the Basic unit and Processing unit. The Basic unit has a production capacity of 4,000 tonnes per month of Latex but at present its sales are limited ₹ 2,000 tonnes to outside market and 1,200 tonnes to the Processing unit.

The transfer price for the year 2013 was agreed at ₹ 400 per tonne. This price has been fixed in line with the external wholesale trade price on 1st January 2013. However due to heavy competition the Basic unit has been forced to reduce the wholesale trade price to ₹ 360 per tonne with effect from 1st June, 2013.

This price however was not made applicable to the sales made to the Processing unit of the company. The Processing unit applied for revision of the price as applicable to the outside market buyers as from 1st June 2013 but the same was turned down by the basic unit.

The Processing unit refines Latex and packs the output Known as 'Liquid – L' in drums of 50 kgs each. The selling price of 'Liquid – L' is ₹ 40 per drum. The Processing unit has a potential of selling a further quantity of 16,000 drums of 'Liquid – L' provided the overall price is reduced to ₹ 32 per drum. In that event it can buy the additional 800 tonnes of Latex from the basic unit whose capacity can be fully utilised. The outside market will not however absorb more than the present quantity of 2,000 tonnes.

The cost data relevant to the operations are:

	Basic Unit ₹	Processing Unit ₹
Raw Materials/tonne	70	Transfer Price
Variable Cost/tonne	140	170
Fixed Costs/month	3,00,000	1,20,000

You are required:

(i) Prepare statement showing the estimated profitability for June 2013 for each unit and the company as a whole on the following bases:

(a) At 80% and 100% capacity utilisation of the Basic unit at the market price and transfer price to the Processing unit of ₹ 400 per tonne.

(b) At 80% capacity utilisation of the basic unit at the market price of ₹ 360 per tonne and the transfer price to the Processing unit of ₹ 400 per tonne.

(c) At 100% capacity utilisation of the Basic unit at the market price and transfer price to the Processing unit of ₹ 360 per tonne.

(ii) Comment on the effect of the company's transfer pricing policy on the profitability of the Processing Unit. [6+3+3+3]

Answer:

(a)

At 80% and 100% capacity utilisation of the Basic unit at the market price and transfer price to the Processing unit of ₹ 400 per tonne.

	Basic unit	Processing unit	Total
i) No. of units	3200	(1200x1000)/50	24000
ii) Contribution per unit	{400-(140 + 70)} = 190	{40 - (570/20)}	11.50
iii) Total contribution	608000	276000	884000
iv) Fixed cost	300000	120000	420000
v) Profit	308000	156000	464000

At 100% capacity:

	Basic unit	Processing unit	Total
i) No. of units	4000	40000	
ii) Contribution per unit	190	3.50	
iii) Total contribution	760000	140000	900000
iv) Fixed cost	300000	120000	420000
v) Profit	460000	20000	480000

Computation of profit: At 80% capacity utilisation of the basic unit at the market price of ₹360 per tonne and the transfer price to the Processing unit of ₹ 400 per tonne

	Basic unit		Processing Unit	Total
	Outside sale	Internal transfer		
(i) No. of units	2000	1200	24000	
(ii) Contribution per unit	150	190	11.50	
(iii) Total contribution	300000	228000		
		528000	276000	804000
(iv) Fixed Cost		300000	120000	420000
(v) Profit		228000	156000	384000

Computation of profit: At 100% capacity utilisation of the Basic unit at the market price and transfer price to the Processing unit of ₹ 360 per tonne.

	Basic unit	Processing unit	Total
No of units	4000	40000	
Contribution per unit	150	5.50	
Total contribution	600000	220000	820000
Fixed cost	300000	120000	420000
Profit	300000	100000	400000

Overall profit is more at 100% capacity of basic unit with a transfer price of Rs 400/- per ton being the market price if individual interests are not considered this may adopted. However, from the view point of the processing unit, it will not be interested to buy more than 1200tonnes from the basic unit, because its profit gets reduced when it takes additional units. Therefore, the present policy of the management is not at all attractive to the processing unit.

8. Write short notes on any three: [5×3=15]

a) Cost Break-down Structure (CBS)
b) Demand Stimulation :
c) Philosophy of Quality Circle.
d) Drum-Buffer-Rope application with relation to Theory of Constraints

Answer:

a) Cost Break-down structure (CBS) is central to Life Cycle Costing (LCC) analysis. It will vary in complexity depending on the purchasing decision. Its aim is to identify all the relevant cost elements and it must have well defined boundaries to avoid omission or duplication. Whatever the complexity any CBS should have the following basic characteristics:

- it must include all cost elements that are relevant to the option under consideration

including internal costs;

- each cost element must be well defined so that all involved have a clear understanding of what is to be included in that element;
- each cost element should be identifiable with a significant level of activity or major item of equipment or software;
- the cost breakdown should be structured in such a way as to allow analysis of specific areas. For example, the purchaser might need to compare spares costs for each option; these costs should therefore be identified within the structure;
- the CBS should be compatible, through cross indexing, with the management accounting procedures used in collecting costs. This will allow costs to be fed directly to the LCC analysis;
- for programmes with subcontractors, these costs should have separate cost categories to allow close control and monitoring; and
- the CBS should be designed to allow different levels of data within various cost categories. For example, the analyst may wish to examine in considerable detail the operator manpower cost whilst only roughly estimating the maintenance manpower contribution. The CBS should be sufficiently flexible to allow cost allocation both horizontally and vertically.

a) Demand Stimulation :

Demand stimulation would mean to stimulate the demand function usually in a positive fashion so as to increase or enhance the demand. An example can be cited in this regard.

For example, if the Government cuts down VAT, the products would become cheaper and hence the demand for the products would increase.

Options for situations in which demand needs to be increased in order to match capacity include:

i) **Pricing** - Varying (lower) pricing to increase demand in periods when demand is less than peak. For example, matinee prices for movie theaters, off-season rates for hotels, night time rates for mobile telephone service, and off-season pricing for items that experience seasonal demand.

ii) **Promotion** - Advertising, direct marketing, bulk purchase discounts, bonus/free offers and other forms of promotion are used to shift demand.

iii) **Back ordering** - By postponing delivery on current orders demand is shifted to period when capacity is not fully utilized. This is really just a form of smoothing demand. Service industries are able to smooth demand by taking reservations or by making appointments in an attempt to avoid walk-in customer. Some refer to this as "partitioning" demand.

iv) **New demand creation** - A new, but complementary demand is created for a product or service. When restaurant customers have to wait, they are frequently diverted into a complementary (but not complimentary) service, the bar. Other examples include the addition of video arcades within movie theaters, and the expansion of services at convenience stores.

b) Philosophy of Quality Circle:

Quality Circle is a small group of 6 to 12 employees doing similar work who voluntarily meet together on a regular basis to identify improvements in their respective work areas using proven techniques for analyzing and solving work related problems coming in the way of achieving and sustaining excellence leading to mutual up liftmen of employees as well as the organization. It is "a way of capturing the creative and innovative power that lies within the work force".

Philosophy

Quality Circles is a people – building philosophy, providing self-motivation and happiness in improving environment without any compulsion or monetary benefits. It represents a philosophy of managing people specially those at the grass root level as well as a clearly defined mechanism and methodology for translating this philosophy into practice and a required structure to make it a way of life. It is bound to succeed where people are respected and are involved in decisions, concerning their work life, and in environments where peoples' capabilities are looked upon as assets to solve work-area problems.

The Quality Circle philosophy calls for a progressive attitude on the part of the management and their willingness to make adjustments, if necessary, in their style and culture. If workers are prepared to contribute their ideas, the management must be willing to create a congenial environment to encourage them to do so.

d) Drum-Buffer-Rope is a Theory of Constraints production application and the name given to the method used to schedule the flow of materials in a TOC facility. Srikanth and Umble (1997), define each component as follows:

- **Drum** : The drum is the constraint and therefore sets the pace for the entire system. The drum must reconcile the customer requirements with the system's constraints. In simpler terms, the drum is the rate or pace of production set by the system's constraint.
- **Buffer** : A buffer includes time or materials that support throughput and/or due date performance. A buffer establishes some protection against uncertainty so that the system can maximize throughput. A time buffer is the additional planned lead time allowed, beyond the required setup and run times, for materials to reach a specified point in the product flow. Strategically placed, time buffers are designed to protect the system throughput from the internal disruptions that are inherent in any process. A stock buffer is defined as inventories of specific products that are held in finished, partially finished, or raw material form, in order to fill customer orders in less than the normal lead-time. Stock buffers are designed to improve the responsiveness of the system to specific market conditions.
- **Rope** : The rope is a schedule for releasing raw materials to the floor. The rope is devised according to the drum and the buffer. The rope ensures that non-capacity constraint resources are subordinate to the constraint. Restated, the rope is a communication process from the constraint to the gating operation that checks or limits material released into the system to support the constraint.