

FINAL EXAMINATION GROUP IV (SYLLABUS 2008)

SUGGESTED ANSWERS TO QUESTIONS JUNE 2015

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.

Please: (i) Answer all part of a question at one place only.
(ii) Open a new page for answer to a new question.

1. (a) State whether the following statements given below are 'True or 'False'. If True, simply rewrite the given statement (=1 mark). If False, state it as False (= ½ marks) and rewrite the correct statement (= ½ marks). 1×5=5

- (i) A 'level strategy' one of the Aggregate Planning strategies, implies matching demand and capacity, period by period.
- (ii) 'Effector' is another name for Management Information System (MIS).
- (iii) Value chain concepts and the value- added concepts are fundamentally same.
- (iv) The term 'Cybernetics' is derived from the Latin word 'Kybernetes'.
- (v) Collaborative tools can consist of software only.

- (b) Out of the different options given against each of the following statements, only one is the most appropriate option. You are required to write it down. 2× 5 = 10

- (i) ANU Ltd., is preparing a quotation for a new product. The time taken for the first unit is 30 hrs. The Company expects 85% learning Curve (Index is- 0.2345). The Company desires that the quotation should be based on the time taken for the final output within the learning period, which is expected to end after the Company has produced 200 units. The time per unit of product to be used for the quotation is

- A. 6.67 hours B. 13.34 hours C. 25.50 hours D. None of these.
[Given: $198^{-0.2345} = 0.2893$, $199^{-0.2345} = 0.2890$, $200^{-0.2345} = 0.2887$]

- (ii) The information relating to the direct material cost of ASTRO Ltd., is as under:

Standard Price per unit	₹3.60
Actual quantity purchased in units	2400
Standard quantity allowed for actual production in units	2175
Material price variation on purchase (Favourable)	₹360

What is the actual purchase price per unit?

- A. ₹3.06 B. ₹3.10 C. ₹3.45 D. ₹3.70
(iii) AMTEK LTD., makes and sells a single product. The Selling Price and Marginal Revenue equations are:

Suggested Answer_Syl2008_June2015_Paper_15

Selling Price = ₹75 – ₹0.002x

Marginal revenue = ₹75 – ₹0.003x

Where x is the number of Product in units, the Company makes

The Variable Costs amount to ₹ 30 per unit and the fixed costs are ₹1,50,000.

In order to maximize the profit, the Selling Price should be:

- A. ₹55 B. ₹45 C. ₹35 D. ₹30

- (iv) AMBA Ltd. operates throughput Accounting System. The details of a product per unit are as under:

Selling Price	₹85
Materials Cost	₹40
Conversion cost	₹25
Time on bottleneck resources	15 minutes

- A. ₹270 B. ₹180 C. ₹120 D. Insufficient information

- (v) The Selling of Product M, produced by AKIN Ltd., is set at ₹1,200 for each unit and sales for the coming year expected to be 500 units. If the Company requires a return of 12% in the coming year on its investment of ₹15 Lakhs in Product- M. The TARGET COST for each unit for the coming year is:

- A. ₹630 B. ₹830 C. ₹840 D. ₹990

- (c) Define the following terms in one/two sentences: 1×5=5

- (i) Query tools
- (ii) Talent Drain
- (iii) Data Mining
- (iv) Esteem Value
- (v) Reverse Engineering

- (d) Expand the following abbreviations: 1×5=5

- (i) UCL
- (ii) CONC
- (iii) QFD
- (iv) CWTQM
- (v) SCP

Answer:

1. (a)

- (i) **False.** A 'Chase strategy', (not level strategy) one of Aggregate Planning strategies, implies matching demand and capacity, period by period.
- (ii) **False.** 'Detector' (not Effector) is another name for Management Information System (MIS).
- (iii) **False.** Value chain concept is fundamentally different from the value-added concepts.
- (iv) **False.** The term 'Cybernetics' is derived from the 'Greek word' Kybernetes'.
- (v) **False.** Collaborative tools can consist of software or hardware.

1. (b)

Suggested Answer_Syl2008_June2015_Paper_15

(i) **A: 6.67 hrs.**

Using the learning curve formula $Y=ax^b$

We get, the average time for the cumulative 200 units

$Y=30 \times 200^{-0.2345} = 8.661$ hrs=say 8.66 hrs.

And average time for cumulative 199 units: $Y=30 \times 199^{-0.2345} = 8.67$ hrs.

Total time for 200 units = $200 \times 8.66 = 1732$ hrs.

Total time for 199 units = $199 \times 8.67 = 1725.33$ hrs.

Difference for the 200th unit = 6.67 hrs.

(ii) **C: ₹3.45**

Actual quantify bought \times Standard price; $2,400 \times 3.60 = ₹8,640$

Deduct favourable price variance = ₹ 360

Actual quantify \times Actual price = ₹ 8,280

So, actual price = $8,280/2,400 = ₹3.45$

(iii) **B: ₹45**

Selling price = ₹(75- 0.002x)

Marginal revenue (MR) = ₹(75- 0.03x)

Variable cost per unit = Marginal cost per unit (MC) = ₹30,

Optimum output for maximum profit $MC=MR: 30=75- 0.003x$

Whence $x = (75-30)/0.003 = 15,000$ units.

Therefore, Selling price (SP) = $75- 0.002x = 75- 0.002 \times 15,000 = 75-30 = ₹45$.

(iv) **B: ₹180.**

(Selling price - Material cost)/ time on bottleneck resources

= $[(₹85- ₹40) /15 \text{ minutes}] \times 60 = ₹ 180$.

(v) **C: ₹840**

Sales revenue	6,00,000
Return on investment required 12% of ₹15 Lakhs	1,80,000
Total cost allowed	4,20,000
Target cost per unit (4,20,000/500)	₹840

1. (c)

- (i) **Query Tools:** allows the users to find the information needed to perform any specific function.
- (ii) **Talent Drain:** is a potential problem in succession planning. Since the top management must identify a small group of managers to receive training and development for promotion, those managers, who are not assigned to development activities, may feel overlooked and would leave the organization.
- (iii) **Data Mining:** is the process of analyzing empirical data. It also enables the extrapolation of information. Such extrapolated results are then used in forecasting and defining trends.
- (iv) **Esteem Value:** are the properties, features or attractiveness which create a desire to possess the article but are not necessarily required so far as the functional performance concerned.
- (v) **Reverse Engineering:** is also known as 'Product Bench Marking'. Every organization tries to compare and try to match with the product of the rivals/competitors.

1. (d)

Suggested Answer_Syl2008_June2015_Paper_15

- (i) **UCL**-Upper Control Limit.
- (ii) **CONC**-Cost of Non-Conformance
- (iii) **QFD**- Quality Function Deployment
- (iv) **CWTQM**- Companywide Total Quality Management
- (v) **SCP**-Supply Chain Planning

OR,

SCP- Short term Capacity Planning.

2. (a) R. K. & sons engaged in manufacturing plastic container is working at 40% capacity and produces 10,000 container per annum. The present cost break-up for one container is as under:

Material	₹10
Labour Cost	₹3
Overheads	₹5 (60% Fixed)

The Selling Price is ₹20 per container. If it is decided to work the factory at 50% capacity, the selling price falls by 3%. At 90% capacity, the selling price falls by 5%, accompanied by a similar fall in the prices of material. As a management accountant, you are required to:

- (i) Calculate the profit at 50% and 90% capacities.
- (ii) Calculate the Break-even point for capacity production. 5+5=10

- (b) What do you mean by Back flushing in JIT System? Explain briefly the problems with Back flushing, which must be corrected/addressed for the effective functioning of the system. 1+4=5

Answer:

2. (a)

Output at 40% capacity = 10,000 units

Output at 50% capacity = 12,500 units

Output at 90% capacity = 22,500 units

Profitability Statement at 50% & 90% capacities

Particulars	50% Capacity		90% Capacity	
	Per unit (₹)	Total (₹)	Per unit (₹)	Total (₹)
a. Sales (with 3% and 5% fall in selling price respectively)	19.40	2,42,500	19.00	4,27,500
b. Variable Cost				
Materials (with 3% & 5% fall in selling price)	9.70	1,21,250	9.50	2,13,750
Wages	3.00	37,500	3.00	67,500
Variable overhead (40% of ₹ 5.00)	<u>2.00</u>	<u>25,000</u>	<u>2.00</u>	<u>45,000</u>
Total Variable Cost	<u>14.70</u>	<u>1,83,750</u>	<u>14.50</u>	<u>3,26,250</u>
c. Contribution (a-b)	4.70	58,750	4.50	1,01,250
d. Fixed Overhead [(60% of ₹ 5.00) × 10,000]		30,000		30,000
e. Profit (c-d)		28,750		71,250

$$\text{Break - even Point} = \frac{\text{Fixed Expenses}}{\text{Contribution per unit}}$$

Suggested Answer_Syl2008_June2015_Paper_15

$$\text{Break - even at 50\% capacity} = \frac{30,000}{4.70} = 6383 \text{ units}$$

$$\text{Break - even at 90\% capacity} = \frac{30,000}{4.50} = 6667 \text{ units}$$

2. (b)

Backflush Costing:

An alternative approach to Sequential Tracking is Backflush Costing. Traditional normal and standard costing systems use the Sequential Tracking method for accounting costs. This involves recording journal entries in the same order as transactions occur, i.e. purchase, issue of materials, production, OH absorption, etc. It is a costing system that omits recording some or all of the journal entries relating to the cycle from purchase of Direct Materials to the sale of Finished Goods. The Journal Entries for the subsequent stages use normal or standard costs to work backward to flush out the costs in the cycle for which the Journal Entries were omitted earlier.

Suitability in JIT: Given the large transaction volumes associated in JIT, Backflush Costing is ideal when compared to Sequential Tracking method. However, the following issues must be corrected before effective implementation of Backflush Costing–

- (i) **Accurate Production Reports:** The total production figure entered into the system must be absolutely correct, or else the wrong component types and quantities will be subtracted from stock. Errors in Production Reporting can be reduced by proper staff training and reducing staff turnover.
- (ii) **Proper Scrap Reports:** All abnormal scrap must be diligently tracked and recorded. Otherwise, these materials will fall outside the Backflushing System and will not be charged to inventory. Since Scrap can occur anywhere in a production process, lack of attention by any of the Production Staff can result in an inaccurate inventory.
- (iii) **Lot Tracing:** Lot Tracing is impossible under Backflushing System. It is required when a Manufacturer needs to keep records of which production lots were used to create a product in case all the items in a lot must be recalled. Only a Picking System can adequately record this information. Some computer systems allow picking and Backflushing System to co-exist.
- (iv) **Inventory Accuracy:** The inventory balance may be too high at all times because the Backflushing Transaction that relieves inventory usually does so only once a day, during which time other inventory is sent to the production process. This makes it difficult to maintain an accurate set of inventory records in the warehouse.

The Success of a Backflushing System is directly related to the Company's willingness to invest in a well-paid, well experienced, well-educated production staff that under goes little turn over.

3. (a) What are the options for demand stimulation? How would you adjust capacity to match current demand? 4+4=8

- (b) A firm manufactures and sells two products viz., Alpha and Beta. Each unit of Alpha requires 1 hour of machining and 2 hours of skilled labour, whereas each unit of Beta uses 2 hours of machining and 1 hour of labour. For the coming month, the machine capacity is limited to 720 machine hours and the skilled labour is limited to 780 hours. Not more than 320 units of Alpha can be sold in the market during a month. Unit Contribution from Alpha is ₹ 6 and from Beta is ₹ 4.

You are required to develop a suitable LPP model that will enable determination of the optimal product-mix. You do not solve the LPP. 7

Answer:

Suggested Answer_Syl2008_June2015_Paper_15

3. (a)

DEMAND STIMULATING OPTIONS:

The following are the options, in which demand needs to be increased in order to match capacity:

- (i) **Pricing:** Varying (lower) pricing to increase demand in periods when demand is less than its peak. For eg., Off- season rates for hotels.
- (ii) **Promotion:** Advertising, direct marketing, bulk purchase discounts, bonus free offers are used to shift off season rates for hotels.
- (iii) **Back Ordering:** By postponing delivery on current orders, demand is shifted to period when capacity is not fully utilized.
- (iv) **New Demand Creations:** A new but complementary demand is created for a product or service. When restaurant customers have to wait, they are frequently directed into a complimentary service, the bar.

Options, which can be used to increase or decrease capacity to match current demand include:

- (i) **Hire/Layoff:** By hiring additional workers as needed or by laying off workers not currently required to meet demand, firms can maintain a balance between capacity and demand.
- (ii) **Overtime:** By asking or requiring workers to work extra hours a day or an extra day per week, firms can create a temporary increase in capacity without the added expenses of hiring additional worker.
- (iii) **Part-time or casual Labour:** By utilizing temporary workers or casual Labour, firms can increase capacity to match current demand.
- (iv) **Inventory:** Build up in periods of slack demand and used to full demand during periods of high demand.
- (v) **Sub-contracting:** By sub-contracting work to an alternate source, additional capacity is temporarily obtained.
- (vi) **Cross-training:** Cross trained employees may be able to perform tasks in several operations, creating flexibility when scheduling capacity.

3. (b)

Products	Machining	Skilled Labour	Contribution (₹)
Alpha	1 hr	2hr	6
Beta	2hr	1hr	4
Available hours	720 hrs	780 hrs	

Let x_1 be the no. of units of Alpha produced

Let x_2 be the no. of units of Beta produced.

Objective function: $Z \max = (6x_1 + 4x_2)$

Subject to constraints

$$x_1 + 2x_2 \leq 720$$

$$2x_1 + x_2 \leq 780$$

$$x_1 \leq 320$$

$$x_1, x_2 \geq 0. (\text{None -negativity factor})$$

Suggested Answer_Syl2008_June2015_Paper_15

4. Bajrangbali Public Health Centre runs an Intensive Medical Care unit. For this purpose, it has hired a building at a rent of ₹ 50,000 per month, with an understanding that it would bear the repairs and maintenance charges also. The unit consists of 25 beds and 5 more beds can be comfortably accommodated when the occasion so demands.

The permanent staff attached to the unit is as follows:

2 Supervisors, each at a salary of ₹ 5,000 per month.

4 Nurses, each at a salary of ₹ 3,000 per month.

2 Ward boys, each at a salary of ₹ 1,500 per month.

Though the unit is open for the patients for all the 365 days in a year, scrutiny of accounts in 2014 revealed that only for 120 days in the year, the unit had the full capacity of 25 patients per day and for another 80 days, it had on an average of 20 beds only occupied per day. But there were also occasions, when the beds were full, extra beds were hired at a charge of ₹ 50 per bed per day and this did not come to more than 5 beds extra above the normal capacity on any one day. The total hire charges for the extra beds incurred for the whole year amounts to ₹ 20,000.

The unit engaged expert doctors from outside to attend on the patients and the fees were paid on the basis of the number of patients attended and the time spent by them and on an average worked out to ₹ 1,00,000 per month in 2014. The other expenses for the year were as under:

	₹
Repairs & Maintenance	36,000
Foods supplied to patients	4,44,000
Sweepers and other services (variable)	1,25,000
Laundry charges for Patients' bed-linen	2,80,000
Medicines supplied	3,50,000
Cost of Oxygen, X-ray etc. (Fixed)	5,40,000
General Administrative charges allocated to unit	4,95,500

- (i) If the unit recovered an overall amount of ₹ 1,000 per day on an average from each patient, what is the profit per patient day made by the unit in 2014?
- (ii) The unit wants to work on a budget for 2015 but the number of patients requiring intensive medical care is a very uncertain factor. Assuming that the same revenue and expenses prevails in 2015, in the first instance, work out the number of patient days required by the unit to break-even.

15

Answer:

4. Calculation of number of Patient-days in 2014:

25 beds per day for 120 days	3,000
20 beds per day for 80 days	1,600
Extra bed days (total hire charges/charges per day = 20,000/50)	400
Total number of Patient-days	5,000

Statement of Profit for Bajrangbali Public Health Centre

	₹	₹
Revenue received (5,000 × 1,000)		50,00,000
Less: Marginal Cost		
Food supplied to patients	4,44,000	
Sweeper & other services	1,25,000	
Laundry Charges	2,80,000	
Medicines supplied	3,50,000	
Hire charges for extra beds	20,000	
Doctor's fees (₹ 1,00,000 pm)	12,00,000	
Total Marginal Cost	24,19,000	24,19,000

Suggested Answer_Syl2008_June2015_Paper_15

Contribution		25,81,000
Less Fixed Costs:		
Salaries of Supervisors (2 × 5,000 × 12)	1,20,000	
Salaries of Nurses (4 × 3,000 × 12)	1,44,000	
Salaries of Ward-boys (2 × 1,500 × 12)	36,000	
Rent of Buildings (₹ 50,000 × 12)	6,00,000	
Cost of Oxygen, X-ray etc,	5,40,000	
General Administrative Charges	4,95,500	
Repairs and Maintenance	36,000	
Total Fixed Cost	19,71,500	19,71,500
Profit		6,09,500
Profit per patient-day = 6,09,500 ÷ 5,000 = 121.90		

Calculation of Break-even Point:

Break-Even Point = Fixed Expenses ÷ P/V ratio

P/V Ratio = (Contribution/Sales) × 100 = (25,81,000/50,00,000) × 100 = 51.62%

B. E. Point (₹) = (19,71,500 ÷ 51.62) × 100 = ₹ 38,19,256.10

B. E. Point (No. of days) = 38,19,256.10 ÷ 1,000 = 3819.26 Patient-days.

5. (a) What is 'Quality Circle'? What is the structure of the Quality Circle? 2+3=5

(b) Day-Night Travelling Agency deals with numerous personal callers each day and prides itself on its level of service. The time to deal with each caller depend on the client's requirements which range from, say, a request for a brochure to booking a round-the-world-cruise.

The time taken by the officer of the Agency to deal with clients and the arrival pattern of clients follow the distribution as given below:

Time to deal with clients	Minutes	2	4	6	10	14	20	30
	Probability	0.05	0.10	0.15	0.30	0.25	0.10	0.5

Time elapsing between arrivals	Minutes	1	8	15	25
	Probability	0.20	0.40	0.30	0.10

You are required to simulate the arrival and serving of 10 clients by taking the following Random Numbers and

(i) Indicate which of the clients will wait for how many minutes and

(ii) Calculate the probability of time office being idle.

Take the starting time as 10AM.

Random Numbers to be used are:

Arrival pattern	02	48	43	75	89	36	96	47	36	61
Serving Pattern	60	73	61	35	28	16	80	46	60	11

10

Answer:

5. (a)

Definition of Quality Circle:

Quality Circle is a Participative management technique within the framework of a companywide quality system in which small teams of (usually 6 to 12) employees voluntarily form to define and solve a quality or performance related problem. In Japan (where this practice originated) quality circles are an integral part of enterprise management and are called control circles. It is "a way of capturing the creative and innovative power that lies within the workforce".

Suggested Answer_Syl2008_June2015_Paper_15

Quality Circle is thus a work group of employees who meet regularly to discuss their quality problems, investigate causes, recommend solutions, and take corrective actions. Generally, QC is a small group of employees belonging to the same similar work area. This is so because the employees doing the similar type of work are well familiar to problems faced by them. The size of the QC should not be too big so as to prevent some members from participating meaningfully in its meetings. The Structure of a Quality Circle is shown in Fig-1.

The basic elements in the formation of a quality circle are

- (i) Top management
- (ii) Steering committee
- (iii) Coordinator or facilitator
- (iv) Leader
- (v) Members and
- (vi) Non member.



Fig: 1 Structure quality circle

Top management plays an important role in ensuring the success of implementation of quality circles in the organization.

Steering committees consisting of middle management are also to play a positive role in quality circle activities for its success. It is headed by a senior executive and includes representatives from the top management personnel and human resources development people. It establishes policy, plans and directs the program and meets usually once in a month.

Coordinator who also acts as a **facilitator** is an individual in the organization who has responsibilities for coordinating and directing the quality circle activities within the organization and carries out such functions as would make the operations of quality circles smooth, effective and self sustainable. He is nominated by the management and also acts as a catalyst, innovator, promoter and a guide.

leader of the quality circle is chosen by the members among themselves. Since the members of the quality circles are the basic element in the structure of the quality circle, they may decide to have a leader by rotation. A Circle Leader organizes and conducts circle activities.

Members of the quality circles; Is the small group of employees from the same work area or doing similar type of work. Without Circle members, the programme can not exist. They are the life-blood of Quality Circles.

Non members are those who are not members of the quality circle but may be involved in the quality circle recommendations.

Suggested Answer_Syl2008_June2015_Paper_15

5. (b) Day-night Travelling agency

Time to deal into client service pattern:

TABLE: I

(Time Minutes)	Probability	Cumulative Probability	Random Number Interval
2	0.05	0.05	00-04
4	0.10	0.15	05-14
6	0.15	0.30	15-29
10	0.30	0.60	30-59
14	0.25	0.85	60-84
20	0.10	0.95	85-94
30	0.05	1.00	95-99

Time between arrivals:

TABLE: II

Time(Minutes)	Probability	Cumulative Probability	Random Number Interval
1	0.20	0.20	00-19
8	0.40	0.60	20-59
15	0.30	0.90	60-89
25	0.10	1.00	90-99

Simulation worksheet: (starting Time at 10 A. M.)

Client No.	Random Nos. for Arrival	Time between Arrivals	Arrival Time at (hours)	Service beginning (hours)	Random Nos. for Services	Service Time (mts)	Service End (hours)	Time Client Waiting (Mts)	Time Office Idle (Mts)
1	2	1	10.01	10.01	60	14	10.15	-	1(10.00-10.01)
2	48	8	10.09	10.15	73	14	10.29	6	-
3	43	8	10.17	10.29	61	14	10.43	12	-
4	75	15	10.32	10.43	35	10	10.53	11	-
5	89	15	10.47	10.53	28	6	10.59	6	-
6	36	8	10.55	10.59	16	6	11.05	4	-
7	96	25	11.20	11.20	80	14	11.34	-	15
8	47	8	11.28	11.34	46	10	11.44	6	-
9	36	8	11.36	11.44	60	14	11.58	8	-
10	61	15	11.51	11.58	11	4	12.02	7	-
								60	16

From the table above, it may be seen that the simulation study has been carried out on the queue system for duration of 122 minutes (10.00 to 12.02 Noon). During this time, Time Office of the agency was idle for a total duration of 16 minutes.

(i) Average time spent by a client waiting in queue = $60/10 = 6$ minutes.

(ii) Probability of the time office being idle = $16/122 = 0.1311$ i.e. 13.11%

6. (a) Avneet Ltd., has developed a new cabin cruiser which they have earmarked for the medium to large boat market. A market analysis has a 30% probability of annual sales being 5,000 boats, a 40% probability of 4,000 annual sales and a 30% probability of 3,000 annual sales. This company can go into limited production, where variable costs are ₹ 10,000 per boat and fixed costs are ₹ 8,00,000 annually. Alternatively, they can go into full scale production, where variable costs are ₹ 9,000 per boat and fixed costs are ₹ 50,00,000 annually. If the new boat is to be sold for ₹ 11,000, should the company go into limited or full scale production, when their objective is to maximize the expected profits? As a Cost and Management Accountant, please advise the company. 10+1=11

(b) Explain the four basic principles of TQM?

4

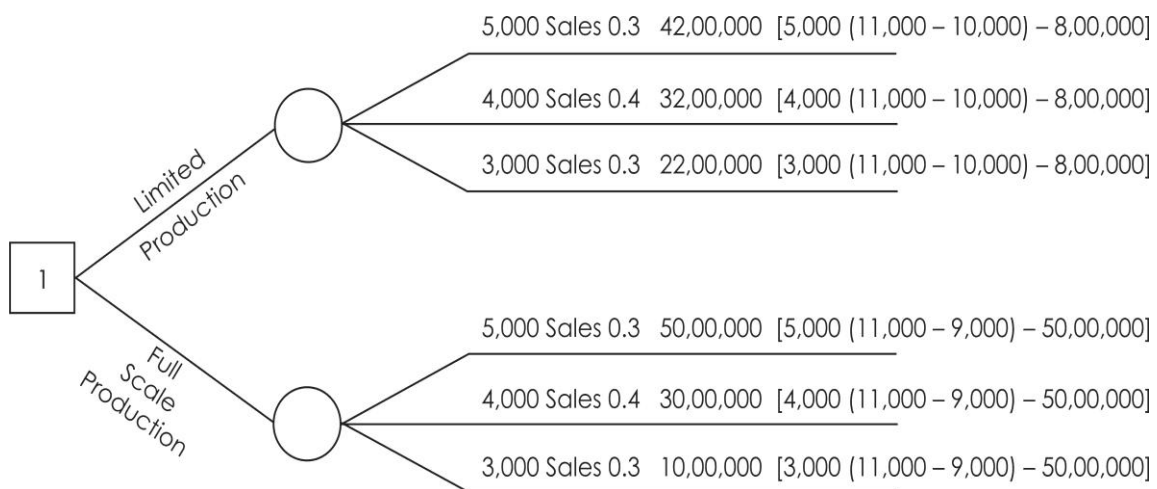
Suggested Answer_Syl2008_June2015_Paper_15

Answer:

6. (a) The various alternatives available to the company and the associated payoffs are shown in the decision tree below:

Payoff Table

		States of Nature		
		5,000 Sales	4,000 Sales	3,000 Sales
		₹	₹	₹
Decision maker's alternatives	I Limited Production	42,00,000	32,00,000	22,00,000
	II Full Scale Production	50,00,000	30,00,000	10,00,000
Probability		0.3	0.4	0.3



The expected value of annual profits for each of the alternative is:

Alternative	Expected Annual Profits (Lakhs)
Limited Scale Production	$0.3(42) + 0.4(32) + 0.3(22) = 12.6 + 12.8 + 6.6 = 32$ Lakhs
Full scale Production	$0.3(50) + 0.4(30) + 0.3(10) = 15 + 12 + 3 = 30$ Lakhs

Conclusion: The Company should go in for Limited Scale Production.

6. (b)

The four basic Principles of TQM are:

- (i) Customer Focus,
- (ii) Management Leadership
- (iii) Belief in continuous improvement
- (iv) Constantly seeking new techniques to support Quality Improvement.

Customer Focus: The purpose of business is to meet the needs of customer and it therefore follows that the customer should be the focus of all the activities of an organization. Quality in a product or service is not what the supplier puts in. It is what the customer gets out and is willing to pay for. In other words, the product should embody the voice of the customer.

Management Leadership: Management should lead the quality movement in the organization by creating a quality culture and work ethics involving everyone from top to bottom in quality. The management style should support and empower the individual and encourage goal-oriented team activity.

Suggested Answer_Syl2008_June2015_Paper_15

Belief in continuous improvement: No organization can rest on its oars but should continuously strive for improvement, realizing that quality is not a destination but a journey. An emphasis should be laid on gathering data to support decision-making, instead of being guided by preconceived notions. The data so obtained should be used as a feedback mechanism to take necessary corrective action.

Constantly seeking new techniques to support Quality Improvement: There is a belief that every member is important for achieving excellence in all activities. The current thinking on TQM is moving from the Quality of Product and Service to Quality of People (work force and community) to embrace Quality of Environment.

7. XYZ Ltd., manufactures by mixing three raw materials. For every 100 kg of the mix, 125 kg of raw materials are used. In April, 2014, 60 batches were prepared to produce an output of 5,600 kgs of the mix. The Standard and the Actual particulars for April, 2014 are as under:

Standard data			Actual data		
Raw Material	Mix %	Price per kg. ₹	Mix %	Price per Kg. ₹	Quantity of raw materials purchased in Kg.
A	50	20	60	21	5,000
B	30	10	20	8	2,000
C	20	5	20	6	1,200

Calculate:

- (i) Material Cost variance
- (ii) Material Price Variance
- (iii) Material Usage Variance
- (iv) Material Mix variance
- (v) Material Yield variance

3×5=15

Answer:

7.

	Standard data			Actual data		
	Qty	Price	Value	Qty	Price	Value
A	3,750	20	75,000	4,500	21	94,500
B	2,250	10	22,500	1,500	8	12,000
C	1,500	5	7,500	1,500	6	9,000
	$60 \times 125 = 7,500$		1,05,000	$60 \times 125 = 7,500$		1,15,500
(-)Standard Loss	$60 \times 25 = 1,500$				$7,500 - 5,600 = 1,900$	
	6,000		1,05,000		5,600	1,15,500

	1	2	3	4
	SQSP	RSQSP	AQSP	AQAP
A	$3,500 \times 20 = 70,000$		$4,500 \times 20 = 90,000$	
B	$2,100 \times 10 = 21,000$		$1,500 \times 10 = 15,000$	
C	$1,400 \times 5 = 7,000$		$1,500 \times 5 = 7,500$	
Total (₹)	98,000	1,05,000	1,12,500	1,15,500

Working Notes: SQ for A = $(5,600/6,000) \times 3,750 = 3,500$

SQ for B = $(5,600/6,000) \times 2,250 = 2,100$

SQ for C = $(5,600/6,000) \times 1,500 = 1,400$

Suggested Answer_Syl2008_June2015_Paper_15

- | | |
|---|--------------|
| 1. SQSP=Standard Cost of Standard Material | = ₹ 98,000 |
| 2. RSQSP=Revised Standard Cost of Material | = ₹1,05,000 |
| 3. AQSP = Standard Cost of Actual Material | = ₹1,12,500 |
| 4. AQAP=Actual Cost of Material = | = ₹1,15,500 |
| (i) Material Cost Variance(₹) = 1- 4 = 98,000 -1,15,500 | = 17,500 (A) |
| (ii) Material Price Variance (₹) = 3- 4=1,12,500-1,15,500 | = 3,000(A) |
| (iii) Material Usage Variance (₹)= 1-3 = 98,000-1,12,500 | = 14,500 (A) |
| (iv) Material Mix Variance (₹)= 2-3 =1,05,000 -1,12,500 | = 7,500 (A) |
| (v) Material Yield(₹) = 1-2= 98,000- 1,05,000 | = 7,000 (A) |

8. Write Short Notes on any three:

5×3=15

(i) Theory of Constraint (TOC)

(ii) Optimized Production Technology (OPT)

(iii) BSC as a Performance management and Strategy deployment methodology

(iv) ISO 9001-2000 is based on eight quality management principles

Answer:

(i) Theory of Constraint (TOC): describes methods to maximize operating income when faced with some bottleneck and some non-bottleneck operations. It defines three measurements:

- Throughput contributions equal to Sales Revenue - Direct Material cost
- Investments (Inventory) equal to Sum of Material cost of direct material inventory, R&D costs and costs of equipment and buildings.
- Operating costs equal to all operating costs(Other than direct material) incurred to earn throughput contribution. Operating costs include salaries, wages, rent utilities and depreciation.

Increasing throughput and/or decreasing inventory or operating expenses should lead to the accomplishment of the firm's goal, to make money now and in future as well. Anything that prevents a firm from reaching this goal is labeled as a constraint.

Theory of constraint thinking regards all progress towards the goal of making money as relating directly to management attention towards the constraints.

The five focus steps are a tool developed to help systems deal with constraints:

Step-1: Identify the constraints

Step-2: Decide how to exploit the system's constraints.

Step-3: Subordinate everything else to the decisions made under Step-2

Step-4: Elevate the system's constraints.

Step-5: If a constraint is broken under Step-4, go back to Step-1 but do not allow inertia to cause new constraints.

Suggested Answer_Syl2008_June2015_Paper_15

(ii) **Optimized Production Technology (OPT):** This is a new approach to Production Management advocated by Gold Raff and Core. OPT is based on the principle that profits are expanded by increasing the throughput of the plant i.e., rate at which raw materials are tuned into sales.

The OPT approach determines what prevents throughput being higher by distinguishing between (a) Bottleneck and (b) Non-bottleneck resources,

This approach advocates that bottleneck resources/activities should be fully utilized while non-bottleneck resources/activities should not be utilized to 100% of their capacity since it would result in increase in inventory.

The most widely recognized management accounting system developed for this purpose is known as 'Throughput Accounting' (TA).

(iii) **BSC (Balance Score Card) as a Performance management and Strategy Deployment Methodology:**

BSC is a new approach to Strategic management, which was developed by Robert Kaplan and David Norton. It is a performance management and Strategy deployment methodology that helps executives translate an organization's mission statement and overall business strategy into specific, quantifiable goals and monitors the organization's performance in terms of these goals. The BSC also aligns budgets to strategy and helps in developing an enterprise performance management system.

The BSC retains traditional financial measures. But financial measures tell the storey of past events, an adequate story for industrial age companies for which investments in long-term capabilities and customer relationships were not critical for success. These financial measures are inadequate, however, for guiding and evaluating the journey that information age companies must make to create future value through investment in customers, suppliers, employees, processes, technology and innovation.

(iv) **ISO 9001-2000:** is based on eight quality management Principles. They are:

- ✓ Principle-1: Customer Focus. Organizations depend on their customers and therefore should understand current and the future customer needs that should meet the customer requirements and strive to exceed customer expectations.
- ✓ Principle-2: Leadership. Leaders establish unity of purpose and direction of the organization. They should create and maintain the internal environment, in which people can become fully involved in achieving organization's objectives.
- ✓ Principle-3: Involvement of People. People of all levels are the essence of an organization and their full involvement enables their abilities to be used for the organization's benefit.
- ✓ Principle-4: Process Approach-A desired result is achieved more efficiently when activities and related resources are managed as a process.
- ✓ Principle-5: System Approach to management -Identifying, understanding and managing inter-related processes as a system contributes to organization's effectiveness and efficiency in achieving its objectives.
- ✓ Principle-6: Continual Improvement-Continual improvement of the organization's overall performance should be a permanent objective of the organization.
- ✓ Principle-7: Factual Approach to decision-making -Effective decisions is based on the analysis of data and information.
- ✓ Principle-8: Mutually beneficial supplier relationship- An organization and its suppliers are interdependent and a mutually beneficial relationship enhances the ability of both to create value.