

Developments in the Business Environment

Question 1

XYZ Ltd. manufactures four products, namely A, B, C and D using the same plant and process. The following information relates to a production period:

| Product | A | B | C | D |
|------------------------|--------|--------|--------|-------|
| Output in units | 720 | 600 | 480 | 504 |
| Cost per unit: | ₹ | ₹ | ₹ | ₹ |
| Direct Material | 42 | 45 | 40 | 48 |
| Direct labour | 10 | 9 | 7 | 8 |
| Machine hours per unit | 4 hrs. | 3 hrs. | 2 hrs. | 1 hr. |

The four products are similar and are usually produced in production runs of 24 units and sold in batches of 12 units. Using machine hour rate currently absorbs the production overheads. The total overheads incurred by the company for the period is as follows:

| | ₹ |
|--|--------|
| Machine operation and Maintenance cost | 63,000 |
| Setup costs | 20,000 |
| Store receiving | 15,000 |
| Inspection | 10,000 |
| Material handling and dispatch | 2,592 |

During the period the following cost drivers are to be used for the overhead cost:

| Cost | Cost driver |
|--------------------------------|------------------------|
| Setup cost | No. of production runs |
| Store receiving | Requisition raised |
| Inspection | No. of production runs |
| Material handling and dispatch | Orders executed |

It is also determined that:

- Machine operation and maintenance cost should be apportioned between setup cost, store receiving and inspection activity in 4:3:2.

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- Number of requisition raised on store is 50 for each product and the no. of order executed is 192, each order being for a batch of 12 of a product.

Required:

- (a) Calculate the total cost of each product, if all overhead costs are absorbed on machine hour rate basis.
- (b) Calculate the total cost of each product using activity base costing.
- (c) Comment briefly on differences disclosed between overhead traced by present system and those traced by activity based costing. (11 Marks)(May, 2004)

Answer

- (a) Total cost of different products (overhead absorption on Machine hour basis)

| | A ₹ | B ₹ | C ₹ | D ₹ |
|-----------------------------|--------|--------|--------|--------|
| Direct material | 42 | 45 | 40 | 48 |
| Direct labour | 10 | 09 | 07 | 08 |
| Overhead | 72 | 54 | 36 | 18 |
| Cost of production per unit | 124 | 108 | 83 | 74 |
| Out put in unit | 720 | 600 | 480 | 504 |
| Total cost | 89,280 | 64,800 | 39,840 | 37,296 |

Machine hours $(720 \times 4 + 600 \times 3 + 480 \times 2 + 504 \times 1) = 6,144$ hours.

Rate per hour = $\frac{\text{₹ } 1,10,592}{6,144 \text{ hours}} = \text{₹ } 18$ per hour.

- (b) Activity based costing system

| | Set up | re receiving | Inspection |
|---|--------|--------------|------------|
| Machine operation and maintenance cost of ₹ 63,000 to be distributed in the ratio of 4: 3: 2. | 28,000 | 21,000 | 14,000 |

| Cost | ₹ | Drivers | No | Cost per unit of driver (₹) |
|----------------------------|--------|---------------------|-----|-----------------------------|
| Set up | 48,000 | Production runs | 96 | 500 |
| Store receiving | 36,000 | Requisitions raised | 200 | 180 |
| Inspection | 24,000 | Production runs | 96 | 250 |
| Material handling and disp | 2,592 | Orders | 192 | 13.50 |

Production Run for A (720/24) = 30 ; B (600/24) = 25 ; C (480/24) = 20 ; D (504/24) = 21.

| | A (₹) | B(₹) | C(₹) | D(₹) |
|--------------------------------|--------|---------|--------|--------|
| Direct material | 30,240 | 27,000 | 19,200 | 24,192 |
| Direct labour | 7,200 | 5,400 | 3,360 | 4,032 |
| Setup | 15,000 | 12,500 | 10,000 | 10,500 |
| Store receiving | 9,000 | 9,000 | 9,000 | 9,000 |
| Inspection | 7,500 | 6,250 | 5,000 | 5,250 |
| Material handling and dispatch | 810 | 675 | 540 | 567 |
| Total cost | 69,750 | 60,825 | 47,100 | 53,541 |
| Per unit cost | 96.875 | 101.375 | 98.125 | 106.23 |

(c)

| | A | B | C | D |
|-------------------|---------|--------|-------|--------|
| Cost per unit (a) | 124 | 108 | 83 | 74 |
| Cost per unit (b) | 96.88 | 101.38 | 98.13 | 106.23 |
| Difference | (27.12) | (6.62) | 15.13 | 32.23 |

The total overheads which are spread over the four products have been apportioned on different bases, causing the product cost to differ substantially: in respect of product A and D a change from traditional machine hour rate to an activity system may have effect on price and profits to the extent that pricing is based on cost plus approach.

Question 2

What is Product Life-cycle Costing? Describe its characteristics and benefits.

(5 Marks)(Nov, 2004)

Answer

Product life cycle costing.

It is an approach used to provide a long-term picture of product line profitability, feedback on the effectiveness of the life cycle planning and cost data to clarify the economic impact on alternatives choices in the design, engineering phase etc. It is also considered as a way to enhance the control of manufacturing costs. It is important to track and measure costs during each stage of a product's life cycle.

Characteristics:-

- (i) Product life cycle costing involves tracing of costs and revenues of each product over the several calendar periods throughout their entire life cycle.

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- (ii) Product life cycle costing traces research and design and development costs and total magnitude of these costs for each individual product and compared with product revenue.
- (iii) Report generation for costs and revenues.

Benefits: -

- (i) The product life cycle costing results in earlier actions to generate revenue or to lower cost than otherwise might be considered.
- (ii) Better decision should follow from a more accurate and realistic assessment of revenues and costs, at least within a particular life cycle stage.
- (iii) Product life cycle thinking can promote long-term rewarding in contrast to short-term profitability rewarding.
- (iv) It provides an overall framework for considering total incremental costs over the life span of a product.

Question 3

What do you mean by 'Back flushing' in JIT system? Explain briefly the problems with back flushing that must be corrected before it will work properly. (4 Marks)(Nov, 2004)

Answer

Back flushing in a JIT system

Traditional accounting systems record the flow of inventory through elaborate accounting procedures. Such systems are required in those manufacturing environment where inventory/WIP values are large. However, since JIT systems operate in modern manufacturing environment characterized by low inventory and WIP values, usually also associated with low cost variances, the requirements of such elaborate accounting procedures does not exist.

Back flushing requires no data entry of any kind until a finished product is completed. At that time the total amount finished is entered into the computer system which is multiplied by all components as per the Bill of materials (BOM) for each item produced. This yields a lengthy list of components that should have been used in the production process and this is subtracted from the opening stock to arrive at the closing stock to arrive at the closing stock/inventory.

The problems with back flushing that must be corrected before it works properly are:

- (i) The total production quantity entered into the system must be absolutely correct, if not, then wrong components and quantities will be subtracted from the stock.
- (ii) All abnormal scrap must be diligently tracked and recorded. Otherwise materials will fall outside the back flushing system and will not be charged to inventory.

- (iii) Lot tracing is impossible under the back flushing system. This 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 need be recalled.
- (iv) The inventory balance may be too high at all times because the back flushing transactions 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.

Question 4

During the last 20 years, KL Ltd's manufacturing operation has become increasingly automated with Computer-controlled robots replacing operators. KL currently manufactures over 100 products of varying levels of design complexity. A single plant wise overhead absorption rate, based on direct labour hours, is used to absorb overhead costs.

In the quarter ended March, KL's manufacturing overhead costs were:

| | (₹'000) |
|--------------------------------------|------------|
| <i>Equipment operation expenses</i> | 125 |
| <i>Equipment maintenance expense</i> | 25 |
| <i>Wages paid to technicians</i> | 85 |
| <i>Wages paid to Store men</i> | 35 |
| <i>Wages paid to despatch staff</i> | <u>40</u> |
| | <u>310</u> |

During the quarter, the company reviewed the Cost Accounting System and concluded that absorbing overhead costs to individual products on a labour hour absorption basis is meaningless. Overhead costs should be attributed to products using an Activity Based Costing (ABC) system and the following was identified as the most significant activities:

- (i) *Receiving component consignments from suppliers*
- (ii) *Setting up equipment for production runs*
- (iii) *Quality inspections*
- (iv) *Despatching goods as per customer's orders.*

It was further observed that in the short-term KL's overheads are 40% fixed and 60% variable. Approximately, half the variable overheads vary in relating to direct labour hours worked and half vary in relation to the number of quality inspections.

Equipment operation and maintenance expenses are apportioned as:

- *Component stores 15% , manufacturing 70% and goods dispatch 15%*

Technician's wages are apportioned as:

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- Equipment maintenance 30%, set up equipment for production runs 40% and quality inspections 30%

During the quarter:

- a total of 2000 direct labour hours were worked (paid at ₹12 per hr.)
- 980 components consignments were received from suppliers
- 1020 production runs were set up
- 640 quality inspections were carried out
- 420 orders were dispatched to customers.

KL's production during the quarter included components R, S and T. The following information is available:

| | Component R | Component S | Component T |
|------------------------------|----------------|----------------|----------------|
| Direct labour Hrs worked | 25 | 480 | 50 |
| Direct Material | ₹ 1,200 | ₹ 2,900 | ₹ 1,800 |
| Component Consignments Recd. | 42 | 24 | 28 |
| Production runs | 16 | 18 | 12 |
| Quality Inspections | 10 | 8 | 18 |
| Orders (goods) despatched | 22 | 85 | 46 |
| Quantity produced | 560 | 12,800 | 2,400 |

Required:

- Calculate the unit cost of R, S and T components, using KL's existing cost accounting system.
- Explain how an ABC system would be developed using the information given. Calculate the unit cost of components R, S and T using ABC system.

(11 Marks) (May, 2005)

Answer

- Single factory direct labour hour overhead rate = $\frac{₹ 3,10,000}{2,000} = ₹ 155$ per direct labour hour

Computation of unit cost (existing system)

| | R (₹) | S (₹) | T (₹) |
|------------------------------------|-------|-------|-------|
| Direct labour cost @ ₹ 12 per hour | 300 | 5,760 | 600 |
| Direct material | 1,200 | 2,900 | 1,800 |

| | | | |
|---|-------|--------|--------|
| Overheads(direct labour hours × ₹ 155 per hour) | 3,875 | 74,400 | 7,750 |
| | 5,375 | 83,060 | 10,150 |
| Quantity Produced (No) | 560 | 12,800 | 2,400 |
| Cost per unit | 9.60 | 6.49 | 4.23 |

(2) ABC system involves the following stages,

1. Identifying the major activities that take place in an organisation.
2. Creating a cost pool /cost centre for each activity
3. Determining the cost driver for each activity
4. Assigning the cost of activities to cost objects (e.g. products, components, customers etc)

The most significant activities have been identified e.g. receiving components consignments from suppliers, setting up equipment for production runs, quality inspections, and despatching orders to customers. The following shows the assignment of the costs to these activities,

(₹,000)

| | <i>Receiving supplies</i> | <i>Set ups</i> | <i>Quality inspection</i> | <i>Dispatch</i> | <i>Total</i> |
|--|-------------------------------|--------------------|-------------------------------|-----------------|--------------|
| Equipment operation expenses | 18.75 | 87.50 | | 18.75 | 125.00 |
| Maintenance | 3.75 | 17.50 | | 3.75 | 25.00 |
| Technicians wages initially allocated to Maintenance(30% of ₹ 85,000= ₹25,500 and then reallocated on same basis on maintenance) | 3.83 | 17.85 | | 3.82 | 25.50 |
| Balance of technicians wages allocated to set ups and quality inspections | | 34.00 | 25.50 | | 59.50 |
| Stores wages – Receiving | 35.00 | | | | 35.00 |
| Despatch wages – Despatch | | | | 40.00 | 40.00 |
| | 61.33 | 156.85 | 25.50 | 66.32 | 310.00 |

Note: Equipment operation expenses and Maintenance allocated on the basis 15%, 70% and 15% as specified in the question.

The next stage is to identify the cost drivers for each activity and establish cost driver rates by dividing the activity costs by a measure of cost driver usage for the period. The calculations are as follows:-

$$\text{Receiving supplies} \left(\frac{₹ 61,330}{980} \right) = ₹ 62.58 \text{ per component.}$$

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$$\text{Performing set ups} \left(\frac{1,56,850}{1,020} \right) = ₹ 153.77 \text{ per set up}$$

$$\text{Despatching goods} \left(\frac{66,320}{420} \right) = ₹ 157.90 \text{ per despatch}$$

$$\text{Quality inspection} \left(\frac{25,500}{640} \right) = ₹ 39.84 \text{ per quality inspection}$$

Finally, costs are assigned to components based on their cost driver usage. The assignments are as follows,

| | R (₹) | S (₹) | T (₹) |
|----------------------|-----------|-----------|-----------|
| Direct labour | 300 | 5,760 | 600 |
| Direct materials | 1,200 | 2,900 | 1,800 |
| Receiving supplies | 2,628.36 | 1,501.92 | 1,752.24 |
| Performing set ups | 2,460.32 | 2,767.86 | 1,845.24 |
| Quality inspections | 398.40 | 318.72 | 717.12 |
| Despatching goods | 3,473.80 | 13,421.50 | 7,263.40 |
| Total costs | 10,460.88 | 26,670.00 | 13,978.00 |
| No of units produced | 560 | 12,800 | 2,400 |
| Cost per unit | 18.68 | 2.08 | 5.82 |

For components, the overhead costs have been assigned as follows,

(Component R)

Receiving supplies (42 receipts at ₹ 62.58)

Performing set ups (16 production runs at ₹153.77)

Quality inspections (10 at ₹ 39.84)

Despatching goods (22 at ₹ 157.90).

Question 5

Explain which features of the Service organisations may create problems for the application of activity-based costing. (4 Marks) (May, 2005)

Answer

The following may create problem for adoption of ABC system in service organisation –

- (i) Facility sustaining costs (such as property, rents etc.) represent a significant portion of total costs and may only be avoidable if the organisation ceases business. It may be impossible to establish appropriate cost drivers.

- (ii) It is often difficult to define products where they are of intangible nature. Cost objects can therefore be difficult to specify.
- (iii) Many service organisations have not previously had a costing system and much of the information required to set up a ABC system will be non-existent. Therefore introduction of ABC may be expensive.

Question 6

Define Total Quality Management? What are the six Cs for successful implementation of TQM?

(4 Marks) (May, 2005)

Answer

The total quality management is a set of concepts and tools for getting all employees focused on continuous improvement in the eyes of the customer. Quality is an important aspect of world-class manufacturing. The success of Japanese companies is grass rooted in their long-term commitment to improvement of quality. A world class manufacturing approach demands that the quality must be designed into product and the production process, rather than an attempt to remove poor quality by inspection. This means that the objectives of quality assurance in a world- class-manufacturing environment, is not just reject defective product, but to systematically investigate the cause of defects so that they can be gradually eliminated. Though the goal is zero defect, the methodology is one of continuous improvement.

Six Cs of TQM

- (i) Commitment - If a TQM culture is to be developed, so that quality improvement becomes normal part of everyone's job, a clear commitment, from the top must be provided. Without this all else fails.
- (ii) Culture - Training lies at the centre of effecting a change -in culture and attitudes. Negative perceptions must be changed to encourage individual contributions.
- (iii) Continuous improvement - TQM is a process, not a program, necessitating that we are committed in the long term to the never ending search for ways to do the job better.
- (iv) Co-operation: The on-the-job experience of all employees must be fully utilized and their involvement and co-operation sought in the development of improvement strategies and associated performance measures.
- (v) Customer focus: Perfect service with zero defects in all that is acceptable at either internal or external levels.
- (vi) Control: Documentation, procedures and awareness of current best practice are essential if TQM implementations are to function appropriately The need for control mechanisms is frequently overlooked, in practice.

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Question 7

Carlton Ltd. makes and sells a single product; the unit specifications are as follows:

| | | |
|------------------------------------|----------|---|
| <i>Direct Materials X</i> | <i>:</i> | <i>8 sq. metre at ₹ 40 per square metre</i> |
| <i>Machine Time</i> | <i>:</i> | <i>0.6 Running hours</i> |
| <i>Machine cost per gross hour</i> | <i>:</i> | <i>₹400</i> |
| <i>Selling price</i> | <i>:</i> | <i>₹1,000</i> |

Carlton Ltd. requires to fulfil orders for 5,000 product units per period. There are no stock of product units at the beginning or end of the period under review. The stock level of material X remains unchanged throughout the period.

Carlton Ltd. is planning to implement a Quality Management Programme (QPM). The following additional information regarding costs and revenues are given as of now and after implementation of Quality Management Programme.

| <i>Before the implementation of QMP</i> | <i>After the implementation</i> |
|---|--|
| <i>1. 5% of incoming material from suppliers scrapped due to poor receipt and storage organisation.</i> | <i>1. Reduced to 3%.</i> |
| <i>2. 4% of material X input to the machine process is wasted due to processing problems.</i> | <i>2. Reduced to 2.5%</i> |
| <i>3. Inspection and storage of Material X costs Re. 1 per square metre purchased.</i> | <i>3. No change in the unit rate</i> |
| <i>4. Inspection during the production cycle, calibration checks on inspection equipment vendor rating and other checks cost ₹2,50,000 per period</i> | <i>4. Reduction of 40% of the existing cost.</i> |
| <i>5. Production Qty. is increased to allow for the downgrading of 12.5% of the production units at the final inspection stage. Down graded units are sold as seconds at a discount of 30% of the standard selling price.</i> | <i>5. Reduction to 7.5%</i> |
| <i>6. Production Quantity is increased to allow for return from customers (these are replaced free of charge) due to specification failure and account for 5% of units actually delivered to customer.</i> | <i>6. Reduction to 2.5%</i> |

- | | |
|--|---|
| <p>7. Product liability and other claims by customers is estimated at 3% of sales revenue from standard product sale.</p> <p>8. Machine idle time is 20% of Gross machine hrs used (i.e. running hour = 80% of gross/hrs.).</p> <p>9. Sundry costs of Administration, Selling and Distribution total – ₹ 6,00,000 per period.</p> <p>10. Prevention programme costs ₹ 2,00,000</p> | <p>7. Reduction to 1%.</p> <p>8. Reduction to 12.5%.</p> <p>9. Reduction by 10% of the existing.</p> <p>10. Increase to ₹ 6,00,000.</p> |
|--|---|

The Total Quality Management Programme will have a reduction in Machine Run Time required per product unit to 0.5 hr.

Required:

- (a) Prepare summaries showing the calculation of (i) Total production units (pre inspection), (ii) Purchase of Materials X (square metres), (iii) Gross Machine Hours.
- (b) In each case, the figures are required for the situation both before and after the implementation of the Quality Management Programme so that orders for 5,000 product units can be fulfilled.

Prepare Profit and Loss Account for Carlon Ltd. for the period showing the profit earned both before and after the implementation of the Total Quality Programme.

(16 Marks) (May, 2005)

Answer

(a)

| | | Existing | | After TQM Programme |
|----|--|----------|---------------------------------|---------------------|
| i. | Total production units (Preinspection) | | | |
| | Total sales requirements | 5,000 | | 5,000 |
| | Specification losses 5% | 250 | 2.5% | 125 |
| | | 5,250 | | 5,125 |
| | Downgrading at inspection | 750 | | 416 |
| | $\frac{12.5}{87.5} \times 5,250$ | | $\frac{7.5}{92.5} \times 5,125$ | |
| | Total units before inspection | 6,000 | | 5,541 |

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| | | | | |
|-----|---|--------------|----------------------------------|--------------|
| ii | Purchase of material 'X'(Sq Mtr) | | | |
| | Material required to meet pre inspection production requirement 6,000 × 8 SqMtr | 48,000 SqMtr | 5,541×8 SqMtr | 44,328 SqMtr |
| | Processing loss $\frac{4}{96} \times 48,000$ | 2,000 | $\frac{2.5}{97.5} \times 44,328$ | 1,137 |
| | Input to the process | 50,000 | | 45,465 |
| | Scrapped material $\frac{5}{95} \times 50,000$ | 2,632 | $\frac{3}{97} \times 45,465$ | 1,406 |
| | Total purchases | 52,632 | | 46,871 |
| iii | Gross Machine Hours | | | |
| | Initial requirements 6,000 × 0.6 | 3,600 | 5,541 × 0.5 | 2,771 |
| | Idle time $\frac{20}{80} \times 3,600$ | <u>900</u> | $\frac{12.5}{87.5} \times 2,771$ | <u>396</u> |
| | Gross time | <u>4,500</u> | | <u>3,167</u> |

(b) Profit and loss statement

| | ₹ | | ₹ |
|--|-----------|---------------------|-----------|
| Sales revenue 5,000 Units× ₹ 1,000 | 50,00,000 | | 50,00,000 |
| Sales downgraded 750 Units×₹ 700 | 5,25,000 | 416 Units × ₹ 700 | 2,91,200 |
| | 55,25,000 | | 52,91,200 |
| Costs: | | | |
| Material 52,632 Sq Mtr ×₹ 40 | 21,05,280 | 46,871Sq Mtr × ₹ 40 | 18,74,840 |
| Inspection and storage costs 52,632 Sq Mtr ×Re 1 | 52,632 | 46,871Sq Mtr × Re 1 | 46,871 |
| Machine cost 4,500 Hrs × ₹ 400 | 18,00,000 | 3,167 Hrs× ₹ 400 | 12,66,800 |
| Inspection and other cost | 2,50,000 | 2,50,000 × 60% | 1,50,000 |
| Product liability (3% × 50,00,000) | 1,50,000 | 1% × 50,00,000 | 50,000 |

| | | | |
|--|-----------|----------------|-----------|
| Sundry cost of selling, distribution and administration. | 6,00,000 | 6,00,000 × 90% | 5,40,000 |
| Preventive programme cost | 2,00,000 | | 6,00,000 |
| | 51,57,912 | | 45,28,511 |
| Net profit | 3,67,088 | | 7,62,689 |

Question 8

X Video Company sells package of blank video tapes to its customer. It purchases video tapes from Y Tape Company @ ₹ 140 a packet. Y Tape Company pays all freight to X Video Company. No incoming inspection is necessary because Y Tape Company has a superb reputation for delivery of quality merchandise. Annual demand of X Video Company is 13,000 packages. X Video Co. requires 15% annual return on investment. The purchase order lead time is two weeks. The purchase order is passed through Internet and it costs ₹ 2 per order. The relevant insurance, material handling etc ₹ 3.10 per package per year. X Video Company has to decide whether or not to shift to JIT purchasing. Y Tape Company agrees to deliver 100 packages of video tapes 130 times per year (5 times every two weeks) instead of existing delivery system of 1,000 packages 13 times a year with additional amount of ₹ 0.02 per package. X Video Co. incurs no stock out under its current purchasing policy. It is estimated X Video Co. incurs stock out cost on 50 video tape packages under a JIT purchasing policy. In the event of a stock out, X Video Co. has to rush order tape packages which costs ₹ 4 per package. Comment whether X Video Company should implement JIT purchasing system.

Z Co. also supplies video tapes. It agrees to supply @ ₹ 13.60 per package under JIT delivery system. If video tape purchased from Z Co., relevant carrying cost would be ₹ 3 per package against ₹ 3.10 in case of purchasing from Y Tape Co. However Z Co. doesn't enjoy so sterling a reputation for quality. X Video Co. anticipates following negative aspects of purchasing tapes from Z Co.

To incur additional inspection cost of 5 paisa per package.

Average stock out of 360 tapes packages per year would occur, largely resulting from late deliveries. Z Co. cannot rush order at short notice. X Video Co. anticipates lost contribution margin per package of ₹ 8 from stock out.

Customer would likely return 2% of all packages due to poor quality of the tape and to handle this return an additional cost of ₹ 25 per package.

Comment whether X Video Co places order to Z Co.

(12 Marks) (Nov, 2005)

Answer

(i) Comparative Statement of cost for purchasing from Y Co Ltd under current policy & JIT

| Particulars | Current Policy | JIT |
|--|---------------------------------|----------------------------------|
| | ₹ | ₹ |
| Purchasing cost | 18,20,000 (13,000 × 140) | 18,20,260 (13,000 × 140.02) |
| Ordering cost | 26.00(2×13 orders) | 260.00(2×130 orders) |
| Opportunity carrying cost | 10,500.00 (1/2×1000×140×15%) | 1,050.15 (1/2×100×140.02×15%) |
| Other carrying cost (Insurance, material handling etc) | 1,550.00(1/2×1000×3.10) | 155.00 |
| Stock out cost | | 200(4 × 50) |
| Total relevant cost | 18,32,076 | 18,21,925.15 |

Comments: As may be seen from above, the relevant cost under the JIT purchasing policy is lower than the cost incurred under the existing system. Hence, a JIT purchasing policy should be adopted by the company.

(ii) Statement of cost for purchasing from Z Co Ltd.

| Particulars | ₹ |
|---------------------------|--------------------------------|
| Purchasing cost | 1,76,800 (13,000×13.60) |
| Ordering Cost | 260.00 (2×130 orders) |
| Opportunity Carrying Cost | 102.00 (1/2×100×13.60× 15%) |
| Other Carrying Cost | 150.00 (1/2×100×3.00) |
| Stock out Cost | 2,880 (8×360) |
| Inspection Cost | 650.00 (13,000 × .05) |
| Customer Return Cost | 6,500.00 (13,000 × 2% × 25) |
| Total Relevant Cost | 1,87,342 |

Comments: The comparative costs are as follows,

Under current policy ₹ 18,32,076.00

Under purchase under JIT ₹ 18,21,925.10

Under purchase from Z Co Ltd ₹ 1,87,342.00

Packages should be bought from Z Co as it is the cheapest.

Question 9

Explain the concept of activity based costing. How ABC system supports corporate strategy?

(4 Marks) (Nov, 2005)

Answer

ABC is an accounting methodology that assigns costs to activities rather than products and services. This enables resources and overhead costs to be more accurately assigned to products and services that consume them when compared to traditional methods where either labour or machine hrs are considered as absorption basis over cost centres. In order to correctly associate costs with products and services, ABC assigns cost to activities based on their resources. It then assigns cost to 'Cost objects', such as products and customers, based on their use of activities. ABC can track the flow of activities in organization by creating a link between the activity and the cost objects.

ABC supports corporate strategy in many ways such as:

- ABC system can effectively support the management by furnishing data, at the operational level and strategic level. Accurate product costing will help the management to compare the profits of various customers, product lines and to decide on price strategy etc.
- Information generated by ABC system can also encourage management to redesign the products.
- ABC system can change the method of evaluation of new process technologies, to reduce setup times, rationalization of plant lay out in order to reduce or lower material handling cost, improve quality etc.
- ABC system will report on the resource spending.
- ABC analysis helps managers' focus their attention and energy on improving activities and the actions allow the insights from ABC to be translated into increased profits.
- Performance base accurate feedback can be provided to cost centre managers.
- Accurate information on product costs enables better decisions to be made on pricing, marketing, product design and product mix.

Question 10

Computo Ltd. manufactures two parts 'P' and 'Q' for Computer Industry.

P : annual production and sales of 1, 00,000 units at a selling price of ₹100.05per unit.

Q : annual production and sales of 50,000 units at a selling price of ₹150 per unit.

Direct and Indirect costs incurred on these two parts are as follows:

| | ₹ in thousand | | |
|-----------------------------------|---------------|-------|---------------|
| | P | Q | Total |
| Direct Material cost (variable) | 4,200 | 3,000 | 7,200 |
| Labour cost (variable) | 1,500 | 1,000 | 2,500 |
| Direct Machining cost (See Note)* | 700 | 550 | 1,250 |
| Indirect Costs: | | | |
| Machine set up cost | | | 462 |
| Testing cost | | | 2,375 |
| Engineering cost | | | <u>2,250</u> |
| | | | <u>16,037</u> |

Note: Direct machining costs represent the cost of machine capacity dedicated to the production of each product. These costs are fixed and are not expected to vary over the long-run horizon.

Additional information is as follows:

| | P | Q |
|---|-------------|------------|
| Production Batch Size | 1,000 units | 500 units |
| Set up time per batch | 30 hours | 36 hours |
| Testing time per unit | 5 hours | 9 hours |
| Engineering cost incurred on each product | 8.40 lacs | 14.10 lacs |

A foreign competitor has introduced product very similar to 'P'. To maintain the company's share and profit, Computo Ltd. has to reduce the price to ₹86.25. The company calls for a meeting and comes up with a proposal to change design of product 'P'. The expected effect of new design is as follows:

- Direct Material cost is expected to decrease by ₹ 5 per unit.
- Labour cost is expected to decrease by ₹ 2 per unit.
- Machine time is expected to decrease by 15 minutes; previously it took 3 hours to produce 1 unit of 'P'. The machine will be dedicated to the production of new design.
- Set up time will be 28 hours for each set up.
- Time required for testing each unit will be reduced by 1 hour.
- Engineering cost and batch size will be unchanged.

Required:

- (a) *Company management identifies that cost driver for Machine set-up costs is 'set up hours used in batch setting' and for testing costs is 'testing time'. Engineering costs are assigned to products by special study. Calculate the full cost per unit for 'P' and 'Q' using Activity-based costing.*
 - (b) *What is the Mark-up on full cost per unit of P?*
 - (c) *What is the Target cost per unit for new design to maintain the same mark up percentage on full cost per unit as it had earlier? Assume cost per unit of cost drivers for the new design remains unchanged.*
 - (d) *Will the new design achieve the cost reduction target?*
 - (e) *List four possible management actions that the Computo Ltd. should take regarding new design.*
- (16 Marks) (May, 2006)**

Answer

Working Notes:

| <i>Particulars</i> | <i>P</i> | <i>Q</i> |
|--|----------|----------|
| (a) Production/Sales Quantity (units) | 1,00,000 | 50,000 |
| (b) Batch Size (units) | 1000 | 500 |
| (c) No of batches $\left(\frac{a}{b}\right)$ | 100 | 100 |
| (d) Set up time per batch (hours) | 30 | 36 |
| (e) Total set up hours (c × d) (hours) | 3,000 | 3,600 |
| (f) Machine set up cost (₹) | | 4,62,000 |
| (g) Cost driver per machine set up hour $\frac{4,62,000}{6,600} = ₹ 70$ | | |
| (h) Testing time per unit | 5 hours | 9 hours |
| (i) Total testing time (a × h) (hours) | 5,00,000 | 4,50,000 |
| (j) Testing cost ₹23,75,000 | | |
| (k) Cost driver per testing hour $\frac{23,75,000}{9,50,000} = ₹ 2.50$ | | |

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(a) Computation of full cost per unit using Activity Based Costing:

| <i>Particulars</i> | <i>Basis</i> | <i>P</i> | <i>Q</i> |
|---------------------|------------------------|------------------|------------------|
| Direct material | Direct | 42,00,000 | 30,00,000 |
| Direct labour | Direct | 15,00,000 | 10,00,000 |
| Direct machine cost | Direct | 7,00,000 | 5,50,000 |
| Machine set up cost | 3,000 hours @ ₹70 | 2,10,000 | |
| | 3,600 hours @ ₹70 | | 2,52,000 |
| Testing cost | 5,00,000 hours @ ₹2.50 | 12,50,000 | |
| | 4,50,000 hours @ ₹2.50 | | 11,25,000 |
| Engineering cost | Allocated | <u>8,40,000</u> | <u>14,10,000</u> |
| Total cost (₹) | | <u>87,00,000</u> | <u>73,37,000</u> |
| Cost per unit (₹) | | 87.00 | 146.74 |

(b) Mark up on full cost basis for Product P:

| <i>Particulars</i> | <i>Per unit</i> |
|------------------------------------|---|
| Selling price | 100.05 |
| Less: Full cost | 87.00 |
| Mark up | 13.05 |
| Percentage of mark up on full cost | $\frac{13.05}{87.00} \times 100 = 15\%$ |

(c) Target cost of Product P after new design is implemented

| | ₹ |
|---------------------------------------|--------------|
| Target price (given) | 86.25 |
| Mark-up $\frac{86.25 \times 15}{115}$ | <u>11.25</u> |
| Target cost per unit (₹) | <u>75.00</u> |

(d) Statement of cost for new design of P

| <i>Particulars</i> | <i>Basis</i> | <i>Cost P.U.</i> | <i>Total Cost</i> |
|-----------------------|-----------------------------------|------------------|-------------------|
| Direct Material | Decreased by ₹5 p.u. | 37.00 | 37,00,000 |
| Direct Labour | Decreased by ₹2 p.u. | 13.00 | 13,00,000 |
| Direct Machining cost | No change as machine is dedicated | 7.00 | 7,00,000 |

| | | | |
|---------------------|---------------------------------|--------------|------------------|
| Machine set up cost | 100 set up × 28 hours × ₹70 | 1.96 | 1,96,000 |
| Testing cost | 1,00,000 units × ₹2.5 × 4 hours | 10.00 | 10,00,000 |
| Engineering cost | No change | <u>8.40</u> | <u>8,40,000</u> |
| Total cost | | <u>77.36</u> | <u>77,36,000</u> |

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

(e) Possible Management Action:

- Value engineering and value analysis to reduce the direct material costs.
- Time and motion study in order to redefine the direct labour time and related costs.
- Exploring possibility of cost reduction in direct machining cost by using appropriate techniques.
- Identification of non-value added activities and eliminating them in order to reduce overheads.
- The expected selling price based on estimated cost of ₹77.36 per unit is (₹ 77.36 + 15%) ₹88.96. Introduce sensitivity analysis after implementation of new design to study the sales quantity changes in the price range of ₹86.25 to ₹88.96.

Question 11

What is the concept of 'Value-chain' and why is it important for Cost Management?

(4 Marks) (May, 2006)

Answer

Value chain is the linked set of value creating activities from the basic raw materials and components sources to the ultimate end use of the product or service delivered to the customer.

The six business functions contained in the value chain are (i) Research and Development, (ii) Design (iii) Production (iv) Marketing (v) Distribution and (vi) Customer service.

The objective of value chain is to serve as means of increasing the customer satisfaction and managing costs effectively. Coordination of the individual parts of the value chain activities creates conditions to improve customer satisfaction in terms of cost efficiency, quality and delivery. A firm which performs value chain activities more efficiently and at a lower cost than its competitors will be able to gain competitive advantage. The following methodology should be adopted.

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1. The firm should identify the industry value chain and then assign costs, revenues and assets to value activities.
2. Diagnose the cost drivers regulating each value activity.
3. Develop sustainable cost advantage either by controlling cost drivers better than competitors or by reconfiguring the chain value.

By analyzing costs, revenues and assets in each activity systematically a company can achieve low cost. Thus value chain helps managers in deciding how to apply the organization's valuable physical and human resources to each linked process so as to achieve cost effectiveness.

Question 12

What is total-life-cycle costing approach? What is it important? (4 Marks) (May, 2006)

Answer

Total life cycle costing approach: Life cycle costing estimates, tracks and accumulates the costs over a product's entire life cycle from its inception to abandonment or from the initial R & D stage till the final customer servicing and support of the product. It aims at tracing of costs and revenues on product by product basis over several calendar periods throughout their life cycle. Costs are incurred along the product's life cycle starting from product's design, development, manufacture, marketing, servicing and final disposal. The objective is to accumulate all the costs over a product life cycle to determine whether the profits earned during the manufacturing phase will cover the costs incurred during the pre and post manufacturing stages of product life cycle.

Importance:

Product life cycle costing is important for the following reasons:

- (i) When non-production costs like costs associated with R & D, design, marketing, distribution and customer service are significant, it is essential to identify them for target pricing, value engineering and cost management. For example, a poorly designed software package may involve higher costs on marketing, distribution and after sales service.
- (ii) There may be instances where the pre-manufacturing costs like R & D and design are expected to constitute a sizeable portion of life cycle costs. When a high percentage of total life cycle costs are likely to be so incurred before the commencement of production, the firm needs an accurate prediction of costs and revenues during the manufacturing stage to decide whether the costly R & D and design activities should be undertaken.
- (iii) Many costs are locked in at R & D and design stages. Locked in or Committed costs are those costs that have not been incurred at the initial stages of R & D and design but that will be incurred in the future on the basis of the decisions that have already been taken.

For example, the adoption of a certain design will determine the product's material and labour inputs to be incurred during the manufacturing stage. A complicated design may lead to greater expenditure on material and labour costs every time the product is produced. Life cycle budgeting highlights costs throughout the product life cycle and facilitates value engineering at the design stage before costs are locked in.

Total life-cycle costing approach accumulates product costs over the value chain. It is a process of managing all costs along the value chain starting from product's design, development, manufacturing, marketing, service and finally disposal.

Question 13

Differentiate between 'Value-added' and 'Non-value-added' activities in the context of Activity-based costing.

Give examples of Value-added and Non-value-added activities. (4 Marks) (May, 2006)

Answer

A value added activity is an activity that customers perceive as adding usefulness to the product or service they purchase. In other words, it is an activity that, if eliminated, will reduce the actual utility or usefulness which customers obtain from using the product or service. For example, painting a car in a company manufacturing cars or a computer manufacturing company making computers with preloaded software.

A non-value added activity is an activity where there is an opportunity of cost reduction without reducing the product's service potential to the customer. In other words, it is an activity that, if eliminated, will not reduce the actual or perceived value that customers obtain by using the product or service. For example, storage and moving of raw materials, reworking or repairing of products, etc.

Value-added activities enhance the value of products and services in the eyes of the organisation's customers while meeting its own goals. Non-value added activities on the other hand do not contribute to customer-perceived value.

Question 14

Give two examples for each of the following categories in activity based costing:

- (i) Unit level activities*
- (ii) Batch level activities*
- (iii) Product level activities*
- (iv) Facility level activities.*

(4 Marks) (Nov, 2006)

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Answer

Examples:

- | | |
|-----------------------------|--|
| (i) Unit level activities | (i) Use of indirect materials |
| | (ii) Inspection or testing of every item produced or say every 100 th item produced |
| | (iii) Indirect consumables |
| (ii) Batch level activities | (i) Material ordering |
| | (ii) Machine set up costs |
| | (iii) Inspection of products – like first item of every batch |
| (iii) Product level | (i) Designing the product |
| | (ii) Producing parts to a certain specification |
| | (iii) Advertising costs, if advertisement is for individual products |
| (iv) Facility level | (i) Maintenance of buildings |
| | (ii) Plant security |
| | (iii) Production manager's salaries |
| | (iv) Advertising campaigns promoting the company |

Question 15

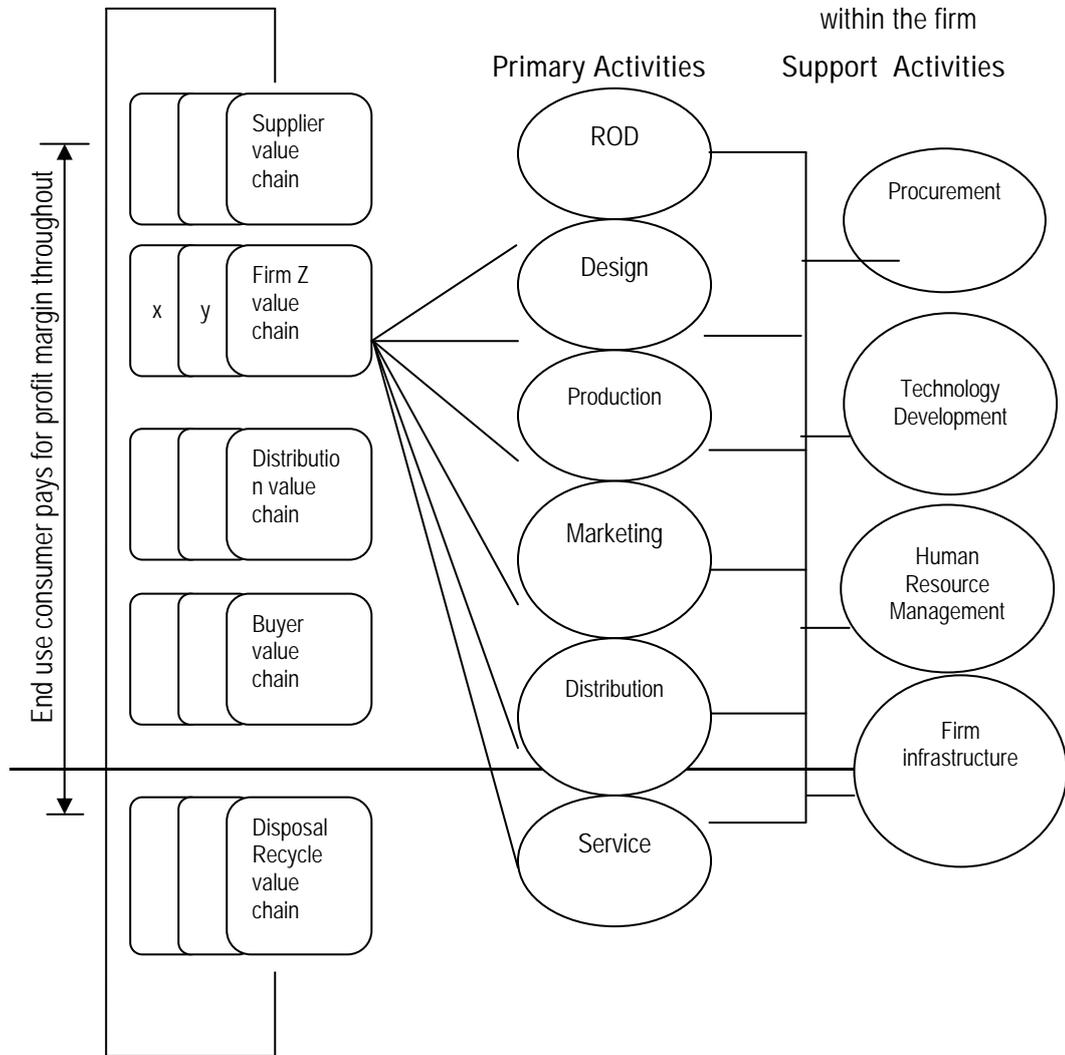
Explain with a diagram the value chain activities within the firm with suitable classifications under primary and support activities and also the industry value chain indicating what the end use consumer pays for. .

(5 Marks) (Nov, 2006)

Answer

Industry Value Chain

Value Chain Activities within the firm
Support Activities



Question 16

Name six benefits of ERP in an enterprise. (3 Marks) (Nov, 2006); (4 Marks) (May, 2004)

Answer

Benefits of ERP

- (a) Product costing.
- (b) Inventory management.

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- (c) Distribution and delivery of pdts.
- (d) E-commerce.
- (e) Automatic control of quality.
- (f) Sales service.
- (g) Improved production planning.
- (h) Quick response to change in market condition.
- (i) Competitive edge by improving business process.

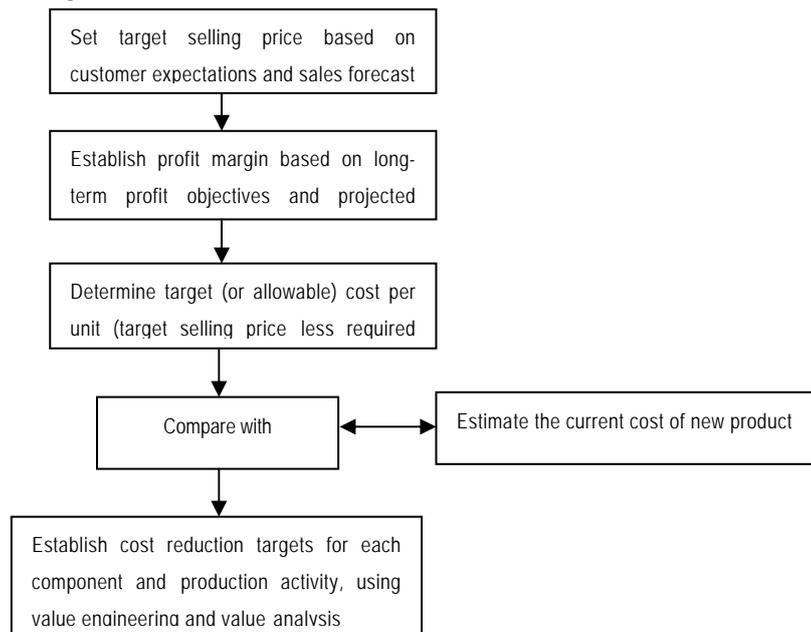
Question 17

List the steps involved in target costing process with the help of a block diagram.

(6 Marks) (November, 2006)

Answer

Target Costing Process



Question 18

What are the essential requirements for successful implementation of TQM?

(6 Marks) (May, 2007)

Answer

Commitment: Quality improvement must be everyone's job. Clear commitment from the top management, steps necessary to provide an environment for changing attitudes and breaking

down barriers to quality improvement must be provided. Support and training for this must be extended.

Culture: Proper training must be given to effect changes in culture and attitude.

Continuous Improvement: Recognition of room for improvement continually as a process, and not merely a one-off programme.

Cooperation: Must be ensured by involving employees by resorting to mutually agreeable improvement strategies and associated performance measures.

Customer Focus: Perfect service with zero defectives with satisfaction to end user whether external customer or internal customer.

Control: Documentation, procedures and awareness of current practices ensure checking deviation from the intended course of implementation.

Question 19

What is product life cycle costing? What are the costs that you would include in product life cycle cost? (4 Marks) (May, 2007)

Answer

Product life cycle costing traces costs and revenues of each product over several calendar periods throughout their entire life cycle.

The costs are included in different stages of the product life cycle.

Development phase – R & D cost / Design cost.

Introduction phase – Promotional cost / Capacity costs.

Growth phase / Maturity – Manufacturing cost / Distribution costs / Product support cost.

Decline / Replacement phase – Plants reused / sold / scrapped / related costs.

Question 20

How does the JIT approach help in improving an organisation's profitability? (4 Marks) (May, 2007)

Answer

JIT approach helps in the reduction of costs/increase in prices as follows:

- (i) Immediate detection of defective goods being manufactured so that early correction is ensured with least scrapping.
- (ii) Eliminates/reduces WIP between machines within working cell.
- (iii) OH costs in the form of rentals for inventory, insurance, maintenance costs etc. are reduced.

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- (iv) Higher product quality ensured by the JIT approach leads to higher premium in the selling price.
- (v) Detection of problem areas due to better pdn/scrap reporting/labour tracing and inventory accuracy lead to reduction in costs by improvement.

Question 21

What is Target Costing? It is said that implementation of the target costing technique requires intensive marketing research. Explain why intensive marketing research is required to implement target costing technique. (9 Marks) (November, 2007)

Answer

Target cost is the difference between estimated selling price of a proposed product with specified functionality and quality and the target margin. This is a cost management technique that aims to produce and sell products that will ensure the target margin. It is an integral part of the product design. While designing the product, the company needs to understand what value target customers will assign to different attributes and different aspects of quality. This requires use of techniques like value engineering and value analysis. Intensive marketing research is required to understand customer preferences and the value they assign to each attribute and quality parameter. This insight is required to be developed must before the product is introduced. The company plays within the space between the maximum attributes and quality that the company can offer and the minimum acceptable to target customers. Therefore in absence of intensive marketing research, the target costing technique cannot be used effectively.

Question 22

"Cost can be managed only at the point of commitment and not at the point of incidence. Therefore, it is necessary to manage cost drivers to manage cost." Explain the statement with reference to structural and executional cost drivers. (5 Marks)(November, 2007)

Answer

A firm commits costs at the time of designing the product and deciding the method of production. It also commits cost at the time of deciding the delivery channel (e.g. delivery through dealers or own retail stores). Costs are incurred at the time of actual production and delivery. Therefore, no significant cost reduction can be achieved at the time when the costs are incurred. Therefore, it is said that costs can be managed at the point of commitment. Cost drivers are factors that drive consumption of resources. Therefore, management of cost drivers is essential to manage costs. Structural cost drivers are those which can be managed by effecting structural changes. Examples of structural cost drivers are scale of operation, scope of operation (i.e. degree of vertical integration), complexity, technology and experience or learning. Thus, structural cost drivers arise from the business model adopted by the company. Executional cost drivers can be managed by executive decisions, examples of executional cost drivers are capacity utilization, plant layout efficiency, product configuration

and linkages with suppliers and customers. It is obvious that cost drivers can be managed only at the point of structural and operating decisions, which commit resources to various activities.

Question 23

What is the fundamental difference between Activity Based Costing System (ABC) and Traditional Costing System? Why more and more organisations in both the manufacturing and non-manufacturing industries are adopting ABC? (10 Marks) (November, 2007)

Answer

In the traditional system of assigning manufacturing overheads, overheads are first allocated and apportioned to cost centres (production and support service cost centres) and then absorbed to cost objects (e.g. products). Under ABC, overheads are first assigned to activities or activity pools (group of activities) and then they are assigned to cost objects. Thus, ABC is a refinement over the traditional costing system. Usually cost centres include a series of different activities. If different products create different demands on those activities, the traditional costing system fails to determine the product cost accurately. In that situation, it becomes necessary to use different rates for different activities or activity pools.

The following are the reasons for adoption of ABC by manufacturing and non-manufacturing industries:

- (i) Fierce competitive pressure has resulted in shrinking profit margin. ABC helps to estimate cost of individual product or service more accurately. This helps to formulate appropriate marketing / corporate strategy.
- (ii) There is product and customer proliferation. Demand on resources by products / customers differ among product / customers. Therefore, product / customer profitability can be measured reasonably accurately, only if consumption of resources can be traced to each individual product / customer.
- (iii) New production techniques have resulted in the increase of the proportion of support service costs in the total cost of delivering value to customers. ABC improves the accuracy of accounting for support service costs.
- (iv) The costs associated with bad decisions have increased substantially.
- (v) Reduction in the cost of data processing has reduced the cost of tracking resources consumption to large number of activities.

Question 24

Explain the main features on 'Enterprise Resource Planning.' (4 Marks) (November, 2007)

Answer

Some of the major features of "Enterprise Resource Planning" (ERP) areas follows:

- (i) ERP facilitates company-wide integrated information system covering all functional areas like manufacturing, selling and distribution, payables, receivables, inventory etc.
- (ii) It performs core activities and increases customer services thereby augmenting the corporate image.
- (iii) ERP bridges the information gap across organization.
- (iv) ERP provides complete integration of systems.
- (v) It is a solution for better project management.
- (vi) It allows automatic induction of latest technologies like electronic fund transfer (EFT), Electronic Data Interchange (EDI), Internet, Intranet, Video Conferencing, E-commerce etc.
- (vii) ERP eliminates most business problems like material shortage, productivity enhancements, customer service, cash management etc.
- (viii) It provides business intelligence tools.

Question 25

Biscuit Ltd. Manufactures 3 types of biscuits, A, B and C, in a fully mechanised factory. The company has been following conventional method of costing and wishes to shift to Activity Based Costing System and therefore wishes to have the following data presented under both the systems for the month.

| | | |
|--|---------------|-----------------|
| <i>Inspection cost</i> | <i>₹ p.m.</i> | <i>73,000</i> |
| <i>Machine – Repairs & Maintenance</i> | <i>₹ p.m.</i> | <i>1,42,000</i> |
| <i>Dye cost</i> | <i>₹ p.m.</i> | <i>10,250</i> |
| <i>Selling overheads</i> | <i>₹ p.m.</i> | <i>1,62,000</i> |

| | <i>Product A</i> | <i>B</i> | <i>C</i> |
|--|------------------|---------------|---------------|
| <i>Prime cost (₹ per unit)</i> | <i>12</i> | <i>9</i> | <i>8</i> |
| <i>Selling price (₹ per unit)</i> | <i>18</i> | <i>14</i> | <i>12</i> |
| <i>Gross production (units/production run)</i> | <i>2,520</i> | <i>2,810</i> | <i>3,010</i> |
| <i>No. of defective units / production run</i> | <i>20</i> | <i>10</i> | <i>10</i> |
| <i>Inspection:</i> | | | <i>C</i> |
| <i>No. of hours / production run</i> | <i>3</i> | <i>4</i> | <i>4</i> |
| <i>Dye cost / production run (₹)</i> | <i>200</i> | <i>300</i> | <i>250</i> |
| <i>No. of machine hours / production run</i> | <i>20</i> | <i>12</i> | <i>30</i> |
| <i>Sales – No. of units / month</i> | <i>25,000</i> | <i>56,000</i> | <i>27,000</i> |

The following additional information is given:

- (i) No accumulation of inventory is considered. All good units produced are sold.
- (ii) All manufacturing and selling overheads are conventionally allocated on the basis of units sold.
- (iii) Product A needs no advertisement. Due to its nutritive value, it is readily consumed by diabetic patients of a hospital. Advertisement costs included in the total selling overhead is ₹ 83,000.
- (iv) Product B needs to be specially packed before being sold, so that it meets competition. ₹ 54,000 was the amount spent for the month in specially packing B, and this has been included in the total selling overhead cost given.

You are required to present product wise profitability of statements under the conventional system and the ABC system and accordingly rank the products. (11 Marks) (May 2008)

Answer

| Sales | A | B | C | Total |
|----------------------------|----------|----------|----------|-----------|
| (i) Units ₹ | 25,000 | 56,000 | 27,000 | 1,08,000 |
| Selling price/unit | 18 | 14 | 12 | |
| (ii) Sales Value (₹) | 4,50,000 | 7,84,000 | 3,24,000 | 15,58,000 |
| (iii) Prime Cost Overhead | 12 | 9 | 8 | |
| (iv) No. of units/run | 2,520 | 2,810 | 3,010 | |
| (v) Prime Cost ₹ | 3,02,400 | 5,05,800 | 2,16,720 | |
| (vi) Gross Margin (ii – v) | 1,47,600 | 2,78,200 | 1,07,280 | 5,33,080 |

| | Total | A | B | C |
|--|-----------------|---------------|---------------|---------------|
| Inspection Cost $\left(\frac{7,3000}{146} \times 30/80/36 \text{ respectively} \right)$ | 73,000 | 15,000 | 40,000 | 18,000 |
| Machine Maintenance $\left(\frac{1,42,000}{710} \times 200/240/270 \text{ respectively} \right)$ | 1,42,000 | 40,000 | 48,000 | 54,000 |
| Dye Cost | <u>10,250</u> | <u>2,000</u> | <u>6,000</u> | <u>2,250</u> |
| Sub Total | <u>2,25,250</u> | <u>57,000</u> | <u>94,000</u> | <u>74,250</u> |

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| | | | | |
|---|-----------------|--------------|-----------------|---------------|
| Selling Overhead Advertisement $\left(\frac{83,000}{56,000 + 27,000} \times 56/27 \text{ respectively} \right)$ | 83,000 | — | 56,000 | 27,000 |
| Other Overheads $\left(\frac{25,000}{108} \times 25/56/27 \text{ respectively} \right)$ | 25,000 | 5,787 | 12,963 | 6,250 |
| Packing | — | — | <u>54,000</u> | — |
| Sub Total Selling Overhead | <u>1,62,000</u> | <u>5,787</u> | <u>1,22,963</u> | <u>33,250</u> |

Workings:

| | A | B | C | Total |
|-----------------------------------|----------|----------|----------|-----------|
| Gross Production/unit /run (1) | 2,520 | 2,810 | 3,010 | |
| Defectives/run (2) | 20 | 10 | 10 | |
| Good units / run (3) | 2,500 | 2,800 | 3,000 | |
| Sales (Goods units)(4) | 25,000 | 56,000 | 27,000 | |
| No. of runs (5) | 10 | 20 | 9 | |
| Gross Production (6) = (1) × (5) | 25,200 | 56,200 | 27,090 | |
| Prime Cost / unit (7) | 12 | 9 | 8 | |
| Prime Cost (8) ₹ | 3,02,400 | 5,05,800 | 2,16,720 | 10,24,920 |
| Inspection hours/run (9) | 3 | 4 | 4 | |
| Inspection hours (10) = (9) × (5) | 30 | 80 | 36 | 146 |
| M/c hours / run (11) | 20 | 12 | 30 | |
| M/c hours (12) = (1) × (5) | 200 | 240 | 270 | 710 |
| Dye Cost/run (13) | 200 | 300 | 250 | |
| Dye cost (14) (13) × (5) | 2,000 | 6,000 | 2,250 | 10,250 |

Conventional Accounting System

| | Total | A | B | C |
|---|----------|----------|----------|----------|
| Sales – units / Production (good units) | 1,08,000 | 25,000 | 56,000 | 27,000 |
| Gross Margin (₹) | 5,33,080 | 1,47,600 | 2,78,200 | 1,07,280 |
| Production overheads (₹) | 2,25,250 | 52,141 | 1,16,797 | 56,313 |
| Selling Overhead (₹) | 1,62,000 | 37,500 | 84,000 | 40,500 |
| Sub-Total Overhead (₹) | 3,87,250 | 89,641 | 2,00,797 | 96,813 |

| | | | | |
|----------------|----------|--------|--------|--------|
| Net profit (₹) | 1,45,830 | 57,959 | 77,403 | 10,467 |
| Ranking | | II | I | III |

Activity Based System

| | A | B | C |
|---|----------|----------|----------|
| Sales – units / Production (good units) | 25,000 | 56,000 | 27,000 |
| Gross Margin (₹) | 1,47,600 | 2,78,200 | 1,07,280 |
| Production overheads (₹) | 57,000 | 94,000 | 74,250 |
| Selling Overhead (₹) | 5,787 | 1,22,963 | 33,250 |
| Sub-Total Overhead (₹) | 62,787 | 2,16,963 | 1,07,500 |
| Net profit (₹) | 84,813 | 61,237 | (220) |
| Ranking | I | II | III |

Question 26

Explain the concept and aim of theory of constraints. What are the key measures of theory of constraints? (7 Marks) (May 2008)

Answer

The theory of constraints focuses its attention on constraints and bottlenecks within organisation which hinder speedy production. The main concept is to maximize the rate of manufacturing output is the throughput of the organisation. This requires to examine the bottlenecks and constraints. A bottleneck is an activity within the organization where the demand for that resource is more than its capacity to supply.

A constraint is a situational factor which makes the achievement of objectives / throughput more difficult than it would otherwise, for example of constraint may be lack of skilled labour, lack of customer orders, or the need to achieve high quality in product output.

For example let meeting the customers' delivery schedule be a major constraint in an organisation. The bottleneck may be a certain machine in the factory. Thus bottlenecks and constraints are closely examined to increase throughput.

Key measures of theory of constraints:

- (i) **Throughput contribution:** It is the rate at which the system generates profits through sales. It is defined as, sales less completely variable cost, sales – direct are excluded. Labour costs tend to be partially fixed and conferred are excluded normally.
- (ii) **Investments:** This is the sum of material costs of direct materials, inventory, WIP, finished goods inventory, R & D costs and costs of equipment and buildings.

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- (iii) Other operating costs: This equals all operating costs (other than direct materials) incurred to earn throughput contribution. Other operating costs include salaries and wages, rent, utilities and depreciation.

Question 27

A company manufactures three types of products namely P, Q and R. The data relating to a period are as under:

| | P | Q | R |
|-------------------------------------|-------|-------|--------|
| Machine hours per unit | 10 | 18 | 14 |
| Direct labour hours per unit @ ₹ 20 | 4 | 12 | 8 |
| Direct Material per unit (₹) | 90 | 80 | 120 |
| Production (units) | 3,000 | 5,000 | 20,000 |

Currently the company uses traditional costing method and absorbs all production overheads on the basis of machine hours. The machine hour rate of overheads is ₹6 per hour.

The company proposes to use activity based costing system and the activity analysis is as under:

| | P | Q | R |
|-------------------------------------|-----|-----|-------|
| Batch size (units) | 150 | 500 | 1,000 |
| Number of purchase orders per batch | 3 | 10 | 8 |
| Number of inspections per batch | 5 | 4 | 3 |

The total production overheads are analysed as under:

| | |
|------------------------------------|-----|
| Machine set up costs | 20% |
| Machine operation costs | 30% |
| Inspection costs | 40% |
| Material procurement related costs | 10% |

Required:

- (i) Calculate the cost per unit of each product using traditional method of absorbing all production overheads on the basis of machine hours.
- (ii) Calculate the cost per unit of each product using activity based costing principles.

(7 Marks) (November, 2008)

Answer

- (i) Cost per unit using traditional method of absorbing all production overheads on the basis of machine hours:

| <i>Products</i> | <i>P</i> | <i>Q</i> | <i>R</i> |
|--|------------|------------|------------|
| | ₹ | ₹ | ₹ |
| Direct materials | 90 | 80 | 120 |
| Direct labour (4:12:8 hours) × ₹20 | 80 | 240 | 160 |
| Production Overheads (10:18:14 hours) × ₹6 | <u>60</u> | <u>108</u> | <u>84</u> |
| Cost per unit | <u>230</u> | <u>428</u> | <u>364</u> |

- (ii) 1. Cost per unit of each product using activity based costing:

| <i>Products</i> | <i>P</i> | <i>Q</i> | <i>R</i> | <i>Total</i> |
|---------------------------------------|----------|----------|----------|--------------|
| A. Production (units) | 3,000 | 5,000 | 20,000 | |
| B. Batch size (units) | 150 | 500 | 1000 | |
| C. Number of batches [A ÷ B] | 20 | 10 | 20 | 50 |
| D. Number of purchase order per batch | 3 | 10 | 8 | |
| E. Total purchase orders [C × D] | 60 | 100 | 160 | 320 |
| F. Number of inspections per batch | 5 | 4 | 3 | |
| G. Total inspections [C × F] | 100 | 40 | 60 | 200 |

2. Total Production overhead

| | | | |
|--------------------------------|--------|--------|----------|
| A. Machine hours per unit | 10 | 18 | 14 |
| B. Production units | 3,000 | 5,000 | 20,000 |
| C. Total machine hours [A × B] | 30,000 | 90,000 | 2,80,000 |

Total machine hours = 4,00,000

Total production overheads = 4,00,000 × ₹6 = ₹24,00,000.

3. Cost driver rates:

| <i>Cost Pool</i> | <i>%</i> | <i>Overheads</i> | <i>Cost Driver</i> | <i>Cost Driver Rate</i> |
|------------------|----------|------------------|--------------------|-------------------------|
| | | ₹ | Units | ₹ |
| Set up | 20% | 4,80,000 | 50 | 9,600 per set up |
| Inspection | 40% | 9,60,000 | 200 | 4,800 per inspection |
| Purchases | 10% | 2,40,000 | 320 | 750 per purchase |
| Machine hours | 30% | 7,20,000 | 4,00,000 | 1.80 per Machine Hour |

4. Cost per unit of P, Q and R:

| <i>Products</i> | <i>P</i> | <i>Q</i> | <i>R</i> |
|--|-----------|-----------|-----------|
| Production (units) | 3,000 | 5,000 | 20,000 |
| | ₹ | ₹ | ₹ |
| Direct Materials (90:80:120) | 2,70,000 | 4,00,000 | 24,00,000 |
| Direct Labour (80:240:160) | 2,40,000 | 12,00,000 | 32,00,000 |
| Overheads: | | | |
| Machine related costs @ ₹1.80/hour (30,000:90,000:2,80,000) | 54,000 | 1,62,000 | 5,04,000 |
| Set-up costs @ ₹9600 / set up (20 : 10 : 20) | 1,92,000 | 96,000 | 1,92,000 |
| Inspection costs @ ₹4800 / inspection (100 :40 : 60) | 4,80,000 | 1,92,000 | 2,88,000 |
| Purchase related costs @ ₹750 / purchase (60 : 100 : 160) | 45,000 | 75,000 | 1,20,000 |
| Total costs | 12,81,000 | 21,25,000 | 67,04,000 |
| Cost per unit (Total cost ÷ units) | 427.00 | 425.00 | 335.20 |

Question 28

Describe the four types of bench marking of critical success factors. (4 Marks) (November, 2008)

Answer

The Benchmarking is of following types:

- Competitive benchmarking:** It involves the comparison of competitors products, processes and business results with own.
- Strategic benchmarking:** It is similar to the process benchmarking in nature but differs in its scope and depth.
- Global benchmarking:** It is a benchmarking through which distinction in international culture, business processes and trade practices across companies are bridged and their ramification for business process improvement are understood and utilized.
- Process benchmarking:** It involves the comparison of an organisation critical business processes and operations against best practice organization that performs similar work or deliver similar services.
- Functional Benchmarking or Generic Benchmarking:** This type of benchmarking is used when organisations look to benchmark with partners drawn from different business sectors or areas of activity to find ways of improving similar functions or work processes.

- (vi) **Internal Benchmarking:** It involves seeking partners from within the same organization, for example, from business units located in different areas.
- (vii) **External Benchmarking:** It involves seeking help of outside organisations that are known to be best in class. External benchmarking provides opportunities of learning from those who are at the leading edge, although it must be remembered that not every best practice solution can be transferred to others.

Question 29

Discuss, how target costing may assist a company in controlling costs and pricing of products.

(4 Marks) (November, 2008)

Answer

Target costing may assist control of costs and pricing of product as under:

- (i) Target costing considers the price that ought to be charged by a company to achieve a given market share.
- (ii) Target costing should take life cycle costs in to consideration.
- (iii) If there is a gap between the target cost and expected cost, ways and means of reducing or eliminating it can be explored.
- (iv) The target cost may be used for controlling costs by comparison.

Question 30

Differentiate between 'Traditional Management Accounting' and 'Value Chain Analysis in the strategic framework'.

(November, 2008) (5 Marks)

Answer

Traditional management accounting focuses on internal information. It often places excessive emphasis on manufacturing costs. It also assumes that cost reduction must be found in the "value-added" process i.e. selling price less the cost of raw material. The value chain analysis approach encompasses external and internal data, uses appropriate cost drivers for all major value-creating processes, exploits linkages throughout the value chain, and provides continuous monitoring of a firm's strategic competitive advantages.

Value Chain vs. Traditional Management Accounting

| | Traditional Management Accounting | Value Chain Analysis in the strategic framework |
|----|---|---|
| 1. | If focuses on internal information | Focuses on external informations. |
| 2. | Application of single cost driver at the overall firm level is taken. | Application of multiple cost drivers i.e. structural and executional are taken for each value activity. |

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| | | |
|----|--|--|
| 3. | It assume that cost reduction must be found in the value added process | Exploits linkages throughout the value chain i.e. within firm, with suppliers and customers. |
| 4. | Insights for strategic decisions somewhat limited in traditional management accounting | Identify cost driver at the individual activity level and develop cost / differentiation advantage either by controlling those drivers better than competitors by reconfiguring the value chain. |

Question 31

Describe the Just-in-time systems

(6 Marks) (November, 2008)

Answer

A complete JIT system begins with production, includes deliveries to a company's production facilities, continues through the manufacturing plant and even includes the types of transactions processed by the accounting system.

- (i) The company must ensure that it receives its supplies on time, preferably directly at the production facility that needs them. The company engineers must assist suppliers at their premises and ensure defect free supplies. Thus raw material inventory is reduced if correct quantities are delivered as per production schedules.
- (ii) Long set-up times are reduced into short ones by eliminating inefficiency. Thus the WIP is reduced and so is the number of products before defects are identified.
- (iii) A 'Kanban' card, which authorizes production of the right quantity by its feeder machine ensures 'pulling' the production process and elimination of inventory. Another method is the introduction of a working cell, which is a cluster of machines run by a single trained operator. This also identifies defects quickly and reduces maintenance costs. Both methods are used together.
- (iv) Work force is trained to be empowered to halt operations understand more about the system, product flow, different machines and thus, elaborate reporting of a past variance is eliminated.
- (v) Suppliers may be paid based on production units adjusted for defects.

Question 32

Explain, how the implementation of JIT approach to manufacturing can be a major source of competitive advantage.

(4 Marks) (November, 2008)

Answer

JIT provides competitive advantage in the following ways:

- (i) Stocks of raw materials and finished goods are eliminated, stock holding costs are avoided.
- (ii) JIT aims at elimination of non-value added activities and elimination of cost in this direction will improve competitive advantage.
- (iii) It affords flexibility to customer requirements where the company can manufacture customized products and the competitive advantage is thereby improved.
- (iv) It focuses the direction of performance based production of high quality product.
- (v) It minimize waiting times and transportation costs.

Question 33

Discuss the benefits accruing from the implementation of a Total Quality Management programme in an organization. (4 Marks) (November, 2008)

Answer

The benefits accruing from the implementation of a Total Quality Management programme in an organisation are:

- (i) There will be increased awareness of quality culture in the organization.
- (ii) It will lead to commitment to continuous improvement.
- (iii) It will focus on customer satisfaction.
- (iv) A greater emphasis on team work will be achieved.

Question 34

A company produces three products A, B and C. The following information is available for a period:

| | A | B | C |
|--|----|----|----|
| <i>Contribution (Rupees per unit) (Sales – Direct materials)</i> | 30 | 25 | 15 |

Machine hours required per unit of production:

| | <i>Hours</i> | | | <i>Throughout accounting ratio</i> |
|------------------|--------------|---|---|------------------------------------|
| | A | B | C | |
| <i>Machine 1</i> | 10 | 2 | 4 | 133.33% |
| <i>Machine 2</i> | 15 | 3 | 6 | 200% |
| <i>Machine 3</i> | 5 | 1 | 2 | 66.67% |

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Estimated sales demand for A, B and C are 500 units each and machine capacity is limited to 6,000 hours for each machine.

You are required to analyse the above information and apply theory of constraints process to remove the constraints.

How many units of each product will be made? (5 Marks)(November, 2008)

Answer

Throughout Accounting ratio is highest for 'Machine 2'.

∴ 'Machine 2' is the bottleneck

Contribution per unit of bottleneck machine hour :

Total 'Machine 2' hours available = 6,000

| | A | B | C |
|---|-------|-------|-------|
| A. Contribution per unit (₹) | 30 | 25 | 15 |
| B. 'Machine 2' hours | 15 | 3 | 6 |
| C. Contribution per 'Machine 2' hours (A / B) | 2 | 8.33 | 2.50 |
| D. Ranking | 3 | 1 | 2 |
| E. Maximum Demand | 500 | 500 | 500 |
| 'Machine 2' hours required (B × E) | 7,500 | 1,500 | 3,000 |
| 'Machine 2' hours available | 1,500 | 1,500 | 3,000 |
| Units | 100 | 500 | 500 |

Question 35

TQ Ltd. implemented a quality improvement programme and had the following results:

| | (Figures in ₹ '000) | |
|-----------------------|---------------------|-------|
| | 2007 | 2008 |
| Sales | 6,000 | 6,000 |
| Scrap | 600 | 300 |
| Rework | 500 | 400 |
| Production inspection | 200 | 240 |
| Product warranty | 300 | 150 |
| Quality training | 75 | 150 |
| Materials inspection | 80 | 60 |

You are required to:

- (i) Classify the quality costs as prevention, appraisal, internal failure and external failure and express each class as a percentage of sales.

(ii) Compute the amount of increase in profits due to quality improvement.

(4 Marks)(November, 2008)

Answer

(i) Classification of Quality Costs

Figures ₹ '000

| | 2007 | % of sales | 2008 | % of sales |
|----------------------|--------------|------------|--------------|--------------|
| Sales | <u>6,000</u> | | <u>6,000</u> | |
| Prevention | | | | |
| Quality training | <u>75</u> | 1.25 | <u>150</u> | 2.5 |
| Appraisal | | | | |
| Product Inspection | <u>200</u> | | <u>240</u> | |
| Materials Inspection | <u>80</u> | | <u>60</u> | |
| | <u>280</u> | 4.67 | <u>300</u> | 5 |
| Internal Failure | | | | |
| Scrap | <u>600</u> | | <u>300</u> | |
| Rework | <u>500</u> | | <u>400</u> | |
| | <u>1100</u> | 18.33 | <u>700</u> | 11.67 |
| External Failure | | | | |
| Product warranty | <u>300</u> | 5 | <u>150</u> | <u>2.5</u> |
| | <u>1755</u> | 29.25 | <u>1300</u> | <u>21.67</u> |

(ii) Cost reduction was effected by 7.58% (29.25 – 21.67) of sales, which is an increase in profit by ₹ 4,55,000.

Question 36

Traditional Ltd. is a manufacturer of a range of goods. The cost structure of its different products is as follows:

| Particulars | Product | | | |
|---------------------------|---------|--------|--------|-------|
| | A | B | C | |
| Direct materials | 50 | 40 | 40 | ₹/u |
| Direct labour @ 10 ₹/hour | 30 | 40 | 50 | ₹/u |
| Production overheads | 30 | 40 | 50 | ₹/u |
| Total Cost | 110 | 120 | 140 | ₹/u |
| Quantity produced | 10,000 | 20,000 | 30,000 | Units |

Traditional Ltd. was absorbing overheads on the basis of direct labour hours. A newly appointed management accountant has suggested that the company should introduce ABC system and has identified cost drivers and cost pools as follows:

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| Activity Cost Pool | Cost Driver | Associated Cost |
|--------------------|---------------------------|-----------------|
| Stores Receiving | Purchase Requisitions | 2,96,000 |
| Inspection | Number of Production runs | 8,94,000 |
| Dispatch | Orders Executed | 2,10,000 |
| Machine Setup | Number of setups | 12,00,000 |

The following information is also supplied:

| Details | Product A | Product B | Product C |
|------------------------------|-----------|-----------|-----------|
| No. of Setups | 360 | 390 | 450 |
| No. of Orders Executed | 180 | 270 | 300 |
| No. of Production runs | 750 | 1,050 | 1,200 |
| No. of Purchase Requisitions | 300 | 450 | 500 |

You are required to calculate activity based production cost of all the three products.

(5 Marks)(June, 2009)

Answer

The total production overheads are ₹ 26,00,000:

Product A: 10,000 × ₹ 30 = ₹ 3,00,000

Product B: 20,000 × ₹ 40 = ₹ 8,00,000

Product C: 30,000 × ₹ 50 = ₹ 15,00,000

On the basis of ABC analysis this amount will be apportioned as follows:

Statement of Activity Based Production Cost

| Activity Cost Pool | Cost Driver | Ratio | Total Amount (₹) | A (₹) | B (₹) | C |
|----------------------|----------------------|----------|------------------|----------|----------|-----------|
| Stores Receiving | Purchase requisition | 6:9:10 | 2,96,000 | 71,040 | 1,06,560 | 1,18,400 |
| Inspection | Production Runs | 5:7:8 | 8,94,000 | 2,23,500 | 3,12,900 | 3,57,600 |
| Dispatch | Orders Executed | 6:9:10 | 2,10,000 | 50,400 | 75,600 | 84,000 |
| Machine Setups | Set ups | 12:13:15 | 12,00,000 | 3,60,000 | 3,90,000 | 4,50,000 |
| Total Activity Cost | | | | 7,04,940 | 8,85,060 | 10,10,000 |
| Quantity Sold | | | | 10,000 | 20,000 | 30,000 |
| Unit Cost | | | | 70.49 | 44.25 | 33.67 |
| Add: Conversion Cost | | | | 80 | 80 | 90 |
| Total | | | | 150.49 | 124.25 | 123.67 |

Question 37

Explain the essential features of Life-cycle costing.

(5 Marks)(June, 2009)

Answer

Essential features of Life Cycle Costing:

Product Life Cycle costing involves :

- Tracing of costs and revenue of product over several calendar period. Throughout their entire life cycle.
- Emphasis is on Cost and revenue accumulation over the entire life cycle of the product.
- Life cycle costing traces research and design.
- It focus on development costs, incurred to individual products over their entire life cycles.
- Total magnitude of research and development costs are reported and compared with product revenues generated in later periods.

Question 38

What is disinvestments strategy? Highlight the main reasons for disinvestments.

(4 Marks)(June, 2009)

Answer

Divestment Strategy: Divestment involves a strategy of selling off or shedding business operations to divert the resources, so released, for other purposes. Selling off a business segment or product division is one of the frequent forms of divestment strategy. It may also include selling off or giving up the control over subsidiary where by the wholly owned subsidiaries may be floated as independently quoted companies.

Reason for Divestment Strategy

1. In case of a firm having an opportunity to get more profitable product or segment but have resource constraint, it may selling off it's unprofitable or less profitable division and utilized the recourse so released. Cost Benefit analysis & Capita Budgeting Method are the useful tool for analyzing this type of situation.
2. In case of purchase of new business, it may be found that some of the part of the acquired business is not upto the mark. In such type of situation disposal of the unwanted part of the business is more desirable than hold it.
3. In case where any business segment or product or subsidiary is pull down the profit of the whole organization, it is better to cut down of that operation of the product or business segment.

Question 39

How can value analysis achieve cost reduction?

(5 Marks)(November, 2009)

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Answer

Value analysis can do cost reduction in the following manner:

- By identifying and removing unnecessary components in a product which had utility earlier.
- By introducing component substitution at a lesser cost without affecting the quality of the product.
- By simplifying the product design.
- By introducing alternative methods with less cost but improved efficiency.

Question 40

What are the critical success factors for the implementation of a "Total Quality Management" programme? (5 Marks)(November, 2009); (4 Marks) (May, 2004)

Answer

Critical success factors of TQM:

- Focus on customer needs.
- Everyone in the organisation should be involved.
- Focus on continuous improvement.
- Design quality in product and production process.
- Effective performance measurement system.
- Rewards and performance measurements should be renewed.
- Appropriate training and education to everyone to understand the aim of TQM.

Question 41

A bank offers three products, viz., deposits, Loans and Credit Cards. The bank has selected 4 activities for a detailed budgeting exercise, following activity based costing methods.

The bank wants to know the product wise total cost per unit for the selected activities, so that prices may be fixed accordingly.

The following information is made available to formulate the budget:

| <i>Activity</i> | <i>Present Cost (₹)</i> | <i>Estimation for the budget period</i> |
|--|-------------------------|---|
| <i>(i) ATM Services:</i> | | |
| <i>(a) Machine maintenance</i> | <i>4,00,000</i> | <i>(all fixed, no change)</i> |
| <i>(b) Rents</i> | <i>2,00,000</i> | <i>(fully fixed; no change)</i> |
| <i>(c) Currency Replenishment Cost</i> | <i>1,00,000</i> | <i>(expected to double during budget period)</i> |
| | <i>7,00,000</i> | <i>(This activity is driven by no. of ATM transactions)</i> |

| | | |
|---------------------------------|------------------|--|
| <i>(ii) Computer Processing</i> | <i>5,00,000</i> | <i>(Half this amount is fixed and no change is expected) (The variable portion is expected to increase to three times the current level). This activity is driven by the number of computer transactions.</i> |
| <i>(iii) Issuing Statements</i> | <i>18,00,000</i> | <i>Presently, 3 lac statements are made. In the budget period, 5 lac statements are expected; For every increase of one lac statement, one lac rupees is the budgeted increase (this activity is driven by the number of statements)</i> |
| <i>(iv) Computer Inquiries</i> | <i>2,00,000</i> | <i>Estimated to increase by 80% during the budget period. (This activity is driven by telephone minutes).</i> |

The activity drivers and their budgeted quantities are given below:

| | <i>Deposits</i> | <i>Loans</i> | <i>Credit Cards</i> |
|--|------------------|-----------------|---------------------|
| <i>No. of ATM Transactions</i> | <i>1,50,000</i> | <i>-</i> | <i>50,000</i> |
| <i>No. of Computer Processing Transactions</i> | <i>15,00,000</i> | <i>2,00,000</i> | <i>3,00,000</i> |
| <i>No. of Statements to be issued</i> | <i>3,50,000</i> | <i>50,000</i> | <i>1,00,000</i> |
| <i>Telephone Minutes</i> | <i>3,60,000</i> | <i>1,80,000</i> | <i>1,80,000</i> |

The bank budgets a volume of 58,600 deposit accounts, 13,000 loan accounts, and 14,000 Credit Card Accounts.

You are required to:

- (i) Calculate the budgeted rate for each activity.*
- (ii) Prepare the budgeted cost statement activity wise.*
- (iii) Find the budgeted product cost per account for each product using (i) and (ii) above.*

(12 Marks)(November, 2009)

Answer

Budget Cost Statement

| Activity | Activity Cost (₹) (Budgeted) | Activity Driver | No. of Units of Activity Driver (Budget) | Activity Rate (₹) | Deposits | Loans | Credit Cards |
|-----------------|------------------------------------|----------------------|--|----------------------|----------|----------|-----------------|
| 1. ATM Services | 8,00,000 | ATM Transaction | 2,00,000 | 4 | 6,00,000 | - | 2,00,000 |
| 2. Computer | 10,00,000 | Computer Transaction | 20,00,000 | 0.50 | 7,50,000 | 1,00,000 | 1,50,000 |

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| | | | | | | | |
|--|-----------|-------------------|----------|------|-----------|----------|----------|
| Processing | | | | | | | |
| 3. Issuing Statements | 20,00,000 | No. of Statements | 5,00,000 | 4.00 | 14,00,000 | 2,00,000 | 4,00,000 |
| 4. Customer Inquiries | 3,60,000 | Telephone Minutes | 7,20,000 | 0.50 | 1,80,000 | 90,000 | 90,000 |
| Budgeted Cost | 41,60,000 | | | | 29,30,000 | 3,90,000 | 8,40,000 |
| Units of product as estimated in the budget period | | | | | 58,600 | 13,000 | 14,000 |
| Budgeted Cost per unit of the product | | | | | 50 | 30 | 60 |

Working Notes:

- (i) ATM $4,00,000 + 2,00,000 + 2 \times 1,00,000 = 8,00,000$
- (ii) Computer $5,00,000$ (Fixed = 2,50,000) Variable = 10,00,000
 $2,50,000$ increase to 3 times = 7,50,000
- (iii) Customer Inquiries $2,00,000 + 80\% \times 2,00,000 = 2 + 1.6 = 3,60,000.$

Question 42

AML Ltd. is engaged in production of three types of ice-cream products: Coco, Strawberry and Vanilla. The company presently sells 50,000 units of Coco @ ₹ 25 per unit, Strawberry 20,000 @ ₹ 20 per unit and Vanilla 60,000 units @ ₹ 15 per unit. The demand is sensitive to selling price and it has been observed that every reduction of ₹ 1 per unit in selling price, increases the demand for each product by 10% to the previous level. The company has the production capacity of 60,500 units of Coco, 24,200 units of Strawberry and 72,600 units of Vanilla. The company marks up 25% on cost of the product.

The Company management decides to apply ABC analysis. For this purpose it identifies four activities and the rates as follows:

| <u>Activity</u> | <u>Cost Rate</u> |
|-----------------|--------------------------|
| Ordering | ₹ 800 per purchase order |
| Delivery | ₹ 700 per delivery |
| Shelf stocking | ₹ 199 per hour |

Customer support and assistance ₹ 1.10 p.u. sold.

The other relevant information for the products are as follows:

| | Coco | Strawberry | Vanilla |
|--------------------------|------|------------|---------|
| Direct Material p.u. (₹) | 8 | 6 | 5 |
| Direct Labour p.u. (₹) | 5 | 4 | 3 |
| No. of purchase orders | 35 | 30 | 15 |
| No. of deliveries | 112 | 66 | 48 |
| Shelf stocking hours | 130 | 150 | 160 |

Under the traditional costing system, store support costs are charged @ 30% of prime cost. In ABC these costs are coming under customer support and assistance.

Required:

- (i) Calculate target cost for each product after a reduction of selling price required to achieve the sales equal to the production capacity.*
- (ii) Calculate the total cost and unit cost of each product at the maximum level using traditional costing.*
- (iii) Calculate the total cost and unit cost of each product at the maximum level using activity based costing.*
- (iv) Compare the cost of each product calculated in (i) and (ii) with (iii) and comment on it.*

(12 Marks) (May, 2010)

Answer

- (i) Cost of products under target costing

Demanded unit and selling price

| <i>Coco</i> | | <i>Strawberry</i> | | <i>Vanilla</i> | |
|----------------------|---------------|----------------------|---------------|----------------------|---------------|
| <i>Selling Price</i> | <i>Demand</i> | <i>Selling Price</i> | <i>Demand</i> | <i>Selling Price</i> | <i>Demand</i> |
| 25 | 50000 | 20 | 20000 | 15 | 60000 |
| 24 | 55000 | 19 | 22000 | 14 | 66000 |
| 23 | 60500 | 18 | 24200 | 13 | 72600 |

Target cost of each product after reduction in selling price

| | <i>Coco</i> | <i>Strawberry</i> | <i>Vanilla</i> |
|---|-------------|-------------------|----------------|
| Selling price after reduction | 23.00 | 18.00 | 13.00 |
| Profit marks up 25% on cost i.e 20 % on selling price | 4.60 | 3.60 | 2.60 |
| Target cost of production (per unit) | 18.40 | 14.40 | 10.40 |

- (ii) Cost of product under traditional costing

| | <i>Coco</i> | <i>Strawberry</i> | <i>Vanilla</i> |
|------------------------------------|--------------|-------------------|----------------|
| | <i>(₹)</i> | <i>(₹)</i> | <i>(₹)</i> |
| Units | 60500 | 24200 | 72600 |
| Material cost (8,6,5 per unit) | 8 | 6 | 5 |
| Labour cost (5,4,3 per unit) | <u>5</u> | <u>4</u> | <u>3</u> |
| Prime cost | 13 | 10 | 8 |
| Store support costs (30% of prime) | <u>3.90</u> | <u>3</u> | <u>2.40</u> |
| Cost per unit | <u>16.90</u> | <u>13.00</u> | <u>10.40</u> |

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(iii) Cost of product under activity based costing

| | <i>Coco</i> | <i>Strawberry</i> | <i>Vanilla</i> |
|---------------------------------------|---------------|-------------------|----------------|
| | (₹) | (₹) | (₹) |
| Units | 60500 | 24200 | 72600 |
| Material cost (8,6,5 per unit) | 484000 | 145200 | 363000 |
| Labour cost (5,4,3 per unit) | <u>302500</u> | <u>96800</u> | <u>217800</u> |
| Prime cost | 786500 | 242000 | 580800 |
| Ordering cost @ ₹ 800 (35, 30, 15) | 28000 | 24000 | 12000 |
| Delivery cost @ ₹ 700 (112, 66, 48) | 78400 | 46200 | 33600 |
| Shelf stocking @ ₹ 199, (130,150,160) | 25870 | 29850 | 31840 |
| Customer Support ₹ 1.10 | <u>66550</u> | <u>26620</u> | <u>79860</u> |
| Total Cost | <u>985320</u> | <u>368670</u> | <u>738100</u> |
| Cost Per unit | 16.29 | 15.23 | 10.17 |

(iv) Comparative Analysis of cost of production (₹)

| | <i>Coco</i> | <i>Strawberry</i> | <i>Vanilla</i> |
|-----------------------------------|-------------|-------------------|----------------|
| | (₹) | (₹) | (₹) |
| (a) As per Target Costing | 18.40 | 14.40 | 10.40 |
| (b) As per traditional Costing | 16.90 | 13.00 | 10.40 |
| (c) As per Activity Based Costing | 16.29 | 15.23 | 10.17 |
| (a) -(c) | 2.11 | -0.83 | 0.23 |
| (b) - (c) | 0.61 | -2.23 | 0.23 |

Note : The cost of product of strawberry is higher in ABC method in comparison to target costing and traditional methods. It indicated that actual profit under ABC costing is less than targeted. For remaining two products, ABC is most suitable.

Question 43

What is Backflushing in JIT? State the problems that must be addressed for the effective functioning of the system. (4 Marks)(May, 2010)

Answer

Back flushing requires no data entry of any kind until a finished product is completed. At the time the total amount finished is entered into the computer system, which multiplies it by all the components listed in the bill of materials for each item produced.

To work system properly some serious problems must corrected.

(i) Production reporting: The total production figure entered into the system must be

absolutely correct.

- (ii) Scrap reporting: All abnormal scrap must be diligently tracked and recorded; otherwise these materials will fall outside the back flushing system and will not be charged to inventory.
- (iii) Lot tracing: Lot tracing is impossible under the back flushing system. It is required when a manufacturer need to keep records of which production lots were used to create a product in case all the items in a lot must be recalled.
- (iv) Inventory accuracy: Maintain accurate set of inventory records.

Question 44

Brief the principles associated with synchronous manufacturing. (5 Marks)(May, 2010)

Answer

Synchronous Manufacturing

It is an all encompassing manufacturing management philosophy which includes a set of principles, procedures, and techniques where every action is evaluated in terms of common goals of the organization.

The 7 principles are :

- i. Focus on synchronizing the production flow than on idle capacities.
- ii. Value of time at a bottleneck resource is equal to the throughput rate of products processed by the bottle neck.
- iii. Value of time at a non bottleneck resource is negligible.
- iv. Level of utilization of a non bottleneck resource is controlled by other constraints within the system.
- v. Resources must be utilized, not simply activated.
- vi. Transfer batch should not be equal to the process batch.
- vii. A process batch should be variable both along its route and overtime.

Question 45

Mention the data required to operate the material requirement planning system.

(4 Marks)(November, 2010)

Answer

Data requirements to operate material requirement planning system:

1. The master Production schedule: This schedule specifies the quantity of each finished unit of products to be produced and the time at which each unit will be required.
2. The Bill of material file: The bill of material file specifies the sub-assemblies, components

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and materials required for each of the finished goods.

3. The inventory file: This file maintains details of items in hand for each sub-assembly, components and materials required for each of the finished goods.
4. The routing file: This file specifies the sequence of operations required to manufacture sub-assemblies, components and finished goods.
5. The master parts file: This file contains information on the production time of sub-assemblies; components produced internally and lead times for externally acquired items.

Question 46

Explain the major components of balanced score card. (4 Marks)(November, 2010)

Answer

Well designed balanced score card combines financial measures of past performance with measures of the firm's drivers of future performance. Generally the Balanced Score Card has the following perspectives from which a company's activity can be evaluate

1. Customer perspective i.e how customers see us?
2. Internal perspective ie. In what processes must the firm excel?
3. Innovation & learning perspective i.e, can we continue to improve and create value?
4. Financial perspective i.e., how we look to our share holders?

Question 47

H. Ltd. manufactures three products. The material cost, selling price and bottleneck resource details per unit are as follows:

| | Product X | Product Y | Product Z |
|---|-----------|-----------|-----------|
| <i>Selling price (₹)</i> | 66 | 75 | 90 |
| <i>Material and other variable cost (₹)</i> | 24 | 30 | 40 |
| <i>Bottleneck resource time (minutes)</i> | 15 | 15 | 20 |

Budgeted factory costs for the period are ₹ 2,21,600. The bottleneck resources time available is 75120 minutes per period.

Required:

- (i) Company adopted throughput accounting and products are ranked according to 'product return per minute'. Select the highest rank product.*
- (ii) Calculate throughput accounting ratio and comment on it. (5 Marks)(November, 2010)*

Answer

(i) Calculation of Rank according to product return per minute

| <i>Particulars</i> | <i>X</i> | <i>Y</i> | <i>Z</i> |
|-------------------------|----------|----------|----------|
| Selling Price | 66 | 75 | 90 |
| Variable Cost | 24 | 30 | 40 |
| Throughput Contribution | 42 | 45 | 50 |
| Minutes per unit | 15 | 15 | 20 |
| Contribution per minute | 2.8 | 3 | 2.5 |
| Ranking | II | I | III |

(ii)

| | | | |
|---|------|------|------|
| Factory Cost per minute(221600/75120) | 2.95 | 2.95 | 2.95 |
| TA Ratio = Contrb per min / cost per minute | 0.95 | 1.02 | 0.85 |
| Ranking based on TA Ratio | II | I | III |

Comment : Product Y yields more contribution compared to average factory contribution per minute, whereas X and Z yield less.

Question 48

Fruitolay had decided to increase the size of the store. It wants the information about the probability of the individual product lines : Lemon, grapes and papaya. It provides the following data for the 2009 for each product line:

| | <i>Lemon</i> | <i>Grapes</i> | <i>Papaya</i> |
|---|--------------|---------------|---------------|
| <i>Revenues</i> | ₹ 79,350.00 | ₹ 2,10,060.00 | ₹ 1,20,990.00 |
| <i>Cost of goods sold</i> | ₹ 60,000.00 | ₹ 1,50,000.00 | ₹ 90,000.00 |
| <i>Cost of bottles returned</i> | ₹ 1,200.00 | ₹ 0 | ₹ 0 |
| <i>Number of purchase orders placed</i> | 36 | 84 | 36 |
| <i>Number of deliveries received</i> | 30 | 219 | 66 |
| <i>Hours of shelf stocking time</i> | 54 | 540 | 270 |
| <i>Items sold</i> | 12,600 | 1,10,400 | 30,600 |

Fruitolay also provides the following information for the year 2009:

| <i>S. No.</i> | <i>Activity</i> | <i>Description of Activity</i> | <i>Total costs (₹)</i> | <i>Cost allocation basis</i> |
|---------------|-----------------------|--|------------------------|---------------------------------------|
| 1. | <i>Bottle returns</i> | <i>Returning of empty bottles to the store</i> | 1,200.00 | <i>Direct tracing to product line</i> |

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| | | | | |
|----|------------------|---|-----------|---------------------|
| 2. | Ordering | Placing of orders of purchases | 15,600.00 | 156 purchase orders |
| 3. | Delivery | Physical delivery and the receipts of merchandise | 25,200.00 | 315 deliveries |
| 4. | Self stocking | Stocking of merchandise on store shelves and ongoing restocking | 17,280.00 | 864 hours of time |
| 5. | Customer support | Assistance provided to customers including bagging and checkout | 30,720.00 | 153600 items sold |

Required:

- (i) Fruitolay currently allocates store support costs (all costs other than the cost of goods sold) to the product line on the basis of the cost of goods sold of each product line. Calculate the operating income and operating income as the percentage of revenue of each product line.
- (ii) If Fruitolay allocates store support costs (all costs other than the cost of goods sold) to the product lines on the basis of ABC system, calculate the operating income and operating income as the percentage of revenue of each product line.
- (iii) compare both the systems. (11 Marks)(November, 2010)

Answer

(i)

| Particulars | Lemon | Grapes | Papaya | Total |
|---------------------------------|--------|----------|----------|----------|
| Revenue | 79,350 | 2,10,060 | 1,20,990 | 4,10,400 |
| Less: Cost of goods sold (COGS) | 60,000 | 1,50,000 | 90,000 | 3,00,000 |
| Less: Store Support Cost | 18,000 | 45,000 | 27,000 | 90,000 |
| Operating income | 1,350 | 15,060 | 3,990 | 20,400 |
| Operating Income % | 1.70% | 7.17% | 3.30% | 4.97% |

(ii) ABC System

| Activity | Cost Hierarchy Level | Total Costs (₹) | Quantity Of Cost Allocation Base | Overhead Allocation Rate |
|------------------|----------------------|-----------------|----------------------------------|--------------------------|
| Ordering | Batch | 15600.00 | 156 Purchase orders | ₹ 100 |
| Delivery | Batch | 25200.00 | 315 delivering orders | ₹ 80 |
| Shelf stocking | Output unit | 17280.00 | 864 self stocking hours | ₹ 20 |
| Customer support | Output unit | 30,720.00 | 153600 items sold | ₹ 0.20 |

| <i>Particulars</i> | <i>Cost Driver</i> | <i>Lemon</i> | <i>Grapes</i> | <i>Papaya</i> | <i>Total</i> |
|--------------------|--------------------|--------------|---------------|---------------|--------------|
| Bottle Returns | Direct | 1,200 | 0 | 0 | 1,200 |
| Ordering | Purchase orders | 3,600 | 8,400 | 3,600 | 15,600 |
| Delivery | Deliveries | 2,400 | 17,520 | 5,280 | 25,200 |
| Self Stocking | Hours of time | 1,080 | 10,800 | 5,400 | 17,280 |
| Customer Support | Items Sold | 2,520 | 22,080 | 6,120 | 30,720 |
| Grand Total | | 10,800 | 58,800 | 20,400 | 90,000 |

| <i>Particulars</i> | <i>Lemon</i> | <i>Grapes</i> | <i>Papaya</i> | <i>Total</i> |
|--------------------------|--------------|---------------|---------------|--------------|
| Revenue | 79,350 | 2,10,060 | 1,20,990 | 410,400 |
| Less: Cost of goods sold | 60,000 | 1,50,000 | 90,000 | 300,000 |
| Less: Store Support Cost | 10,800 | 58,800 | 20,400 | 90,000 |
| Operating income | 8,550 | 1,260 | 10,590 | 20,400 |
| Operating Income % | 10.78% | 0.60% | 8.75% | 4.97% |

Summary

| | <i>Lemon</i> | <i>Grapes</i> | <i>Papaya</i> | <i>Total</i> |
|----------------------------------|--------------|---------------|---------------|--------------|
| Under Traditional Costing System | 1.70% | 7.17% | 3.30% | 4.97% |
| Under ABC System | 10.78% | 0.60% | 8.75% | 4.97% |

The grapes line drops sizeably when ABC is used. Although it constitutes 50 % COGS, it uses a higher percentage of total resources in each activity area., especially the high cost of customer support area. In contrast, lemon line draws a much lower percentage of total resources used in each activity area than its percentage of total COGS. Hence under ABC, Lemon is most profitable. Fruitolay can explore ways to increase sales of lemons and also explore price increases on grapes.

Operating Income Ranking is highest for Grapes under Traditional System because other products bear its overhead cost, whereas under ABC a more accurate picture shows Grapes as the lowest ranking product.

Question 49

List out the remedies available for difficulties experienced during implementation of PRAISE.

(4 Marks)(November, 2010)

Answer

Remedies available for difficulties experienced in each step available during implementation of praise:

Answer

Various stages in the process of benchmarking.

- I Planning
 - Determination of benchmarking goal statement
 - Identification of best performance
 - Establishment of the benchmarking or process improvement team
 - Defining the relevant benchmarking measures
- II Collection of data and information
- III Analysis of finding based on data collected
- IV Formulation and implementation of recommendation
- V Constant Monitoring and reviewing.

Question 52

Classify the following measures under appropriate categories in a balanced score card for a banking company which excels in its home loan products:

- (i) *A new product related to life insurance is being considered for a tie up with the successful housing loan disbursements.*
e.g. every housing loan applicant to be advised to take a life policy or compelled to take a fire insurance policy.
- (ii) *How different sectors of housing loans with different interest rates have been sanctioned, their volumes of growth in the past 4 quarters.*
- (iii) *How many days are taken to service a loan, how many loans have taken longer, what additional loans are to be released soon, e.t.c*

(Students are not required to copy these statements into their answer books)

(3 Marks)(May, 2011)

Answer

- (i) New product tie up - Innovation/learning perspective
- (ii) Growth of Volume - Financial perspective
- (iii) Time for loan/Fresh products - Customer perspective

Question 53

Explain the pre-requisites for successful operation of material requirement planning.

(5 Marks)(May, 2011)

Answer

Pre-requisites for successful operation of MRP system are:

- (i) The latest production and purchasing schedules prepared should be strictly adhered to. Day to Day change from predetermined schedules will cause chaos.
- (ii) Raw Materials, sub-assemblies and components required for production should be pre-determined in quantifiable terms. Standard should be set for the consumption quantity, quality, mix and yield of raw materials for every unit of finished product.
- (iii) Work-force must be appraised of the system and the need for absolute adherence to the schedules prepared.
- (iv) Necessary internal control system should be developed to ensure total adherence to the schedule.
- (v) Accuracy of the data supplied is vital to the MRP system.

Question 54

A company makes a single product which sells at ₹ 800 per unit and whose variable cost of production is ₹ 500 per unit. Production and sales are 1000 units per months. Production is running to full capacity and there is market enough to absorb an additional 20% of output each month.

The company has two options:

Option-I

Inspect finished goods at ₹ 10,000 per month. 4% of production is detected as defectives and scrapped at no value. There will be no warranty replacement, since every defect is detected. A small spare part which wears out due to defective material is required to be replaced at ₹ 2,000 per spare for every 20 units of scrap generated. This repair cost is not included in the manufacturing cost mentioned above.

Option-II

Shift the finished goods inspection at no extra cost, to raw material inspection, (since defective raw materials are entitled to free replacement by the supplier), take up machine set-up tuning and machine inspection at an additional cost of ₹ 8,000 per month, so that scrap of finished goods is completely eliminated. However, delivery of uninspected finished products may result in 1 % of the quantity sold to be replaced under free warranty due to minor variation in dimensions, which does not result in the wearing out of the spare as stated in Option-I

- (i) *Using monthly figures relevant for decision making, advise which option is more beneficial to the company from a financial perspective.*
- (ii) *Identify the quality costs that can be classified as*
 - (a) *appraisal costs and*
 - (b) *external failure costs.*

(5 Marks)(May 2011)

Answer

| | Option I | | Option II | |
|--|---------------|-----------|---------------|------------------|
| Production | 1000 Units | | 1000 Units | |
| Finished Goods Inspection | 10,000 | Appraisal | - | |
| Raw Material Inspection scrap 4% = 40 units x variable cost per unit 500 | 20,000 | Appraisal | 10,000 | |
| Contribution lost 300 x 40 | 12,000 | Appraisal | | |
| Machine repair | 4,000 | Appraisal | - | |
| Machine set up | | | 8,000 | |
| Warranty replacement | - | | | |
| 1% x 1000 = 10 unit | | | | |
| Contribution lost 10 x 300 | | | 3,000 | External failure |
| Variable Cost lost 10 x 500 | | | <u>5,000</u> | External failure |
| Quality Cost | <u>46,000</u> | | <u>26,000</u> | |

Better Option II

Question 55

During the last 20 years, KL Ltd's manufacturing operation has become increasingly automated with computer-controlled robots replacing operators. KL currently manufactures over 100 products of varying levels of design complexity. A single plant wise overhead absorption rate, based on direct labor hours is absorb overhead costs.

In the quarter ended March, KL's manufacturing overhead costs were:

| | (₹ 000) |
|---|-------------------|
| <i>Equipment operation expenses</i> | 125 |
| <i>Equipment maintenance expenses</i> | 25 |
| <i>Wages paid to technicians</i> | 85 |
| <i>Wages paid to component stores staff</i> | 35 |
| <i>Wages paid to dispatch staff</i> | <u>40</u> |
| <i>Total</i> | <u>310</u> |

During the quarter, the company reviewed the Cost Accounting System and concluded that absorbing overhead costs to individual products on a labour hour absorption basis was meaningless and that overhead costs should be attributed to products using an Activity Based Costing (ABC) system, The following are identified as the most significant activities.

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- (i) Receiving component consignments from suppliers.
- (ii) Setting up equipment for production runs
- (iii) Quality inspections
- (iv) Dispatching goods as per customer's orders.

Equipment operation and maintenance expense are apportioned as :

- Component stores 15% production runs 70% and dispatch 15%

Technician's wages are apportioned as:

- Equipment maintenance 30% set up equipment for production runs 40% and quality inspections 30%

During the quarter:

- (i) 980 component consignments were received from suppliers.
- (ii) 1020 production runs were set up
- (iii) 640 quality inspections were carried out.
- (iv) 420 orders were dispatched to customers.

KL's production during the quarter included component R. The following information is available:

| | Component R |
|---------------------------------|-------------|
| Component Consignments received | 45 |
| Production runs | 16 |
| Quality Inspections | 10 |
| Orders (goods) dispatched | 22 |
| Quantity produced | 560 |

Calculate the unit manufacturing overhead cost of component R using ABC system.

(8 Marks) (May 2011)

Answer

| | Receiving Supplies (₹ 000) | Set ups (₹ 000) | Quality Inspection (₹ 000) | Despatch (₹ 000) | Total (₹'000) |
|---|-------------------------------|--------------------|-------------------------------|---------------------|------------------|
| Equipment Operation Expenses | 18.75 | 87.50 | | 18.75 | 125.00 |
| Maintenance technicians wages initially allocated to maintenance (30% of ₹ 85,000 = ₹ 25,500) | 3.75 | 17.50 | | 3.75 | 25.00 |

| | | | | | |
|---|--------------|---------------|--------------|--------------|---------------|
| and then reallocated on the same basis on maintenance | 3.83 | 17.85 | | 3.82 | 25.50 |
| Balance of technician wages, allocated to set ups and quality inspections | | 34.00 | 25.50 | | 59.50 |
| Stores wages – Receiving | 35.00 | | | | 35.00 |
| Despatch wages – Despatch | | | | <u>40.00</u> | <u>40.00</u> |
| | <u>61.33</u> | <u>156.85</u> | <u>25.50</u> | <u>66.32</u> | <u>310.00</u> |

Note: Equipment operations expenses and Maintenance allocated on the basis 15%, 70%, and 15% as specified in the question.

The next stage is to identify cost drivers for each activity and established cost driver rates by dividing the activity costs by a measure of cost drive usage for the period. The Calculations are as follows:

| | | |
|--------------------------------------|---|-------------------------------------|
| Receiving supplies (₹ 61,330/980) | = | ₹ 62.58 per component |
| Performing set ups (₹ 1,56,850/1020) | = | ₹ 153.77 per set up |
| Despatching goods (₹ 66,320/420) | = | ₹ 157.90 per goods order despatched |
| Quality Inspection (₹ 25,500/640) | = | ₹ 39.84 |

Finally the costs are assigned to components based on their cost driver usage. The assignments are as follows:

| | (₹) |
|-----------------------|----------------|
| Receiving supplies | 2816.10 |
| Performing Set Up | 2460.32 |
| Quality Inspection | 398.40 |
| Despatching goods | <u>3473.80</u> |
| Total Overhead Costs | <u>9148.62</u> |
| | (₹) |
| No. of units produced | 560 |
| Cost per unit | 16.34 |

For components the overhead costs have been assigned as follows (for components R)

| | |
|--------------------|----------------------------------|
| Receiving supplies | (45 receipts at ₹ 62.58) |
| Performing setups | (16 production runs at ₹ 153.77) |

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| | |
|---------------------|------------------|
| Quality Inspections | (10 at ₹ 39.84) |
| Despatching goods | (22 at ₹ 157.90) |

Question 56

Classify the following items under appropriate categories of quality costs viz. Prevention Costs, appraisal Cost, Internal Failure Costs and External Failure costs:

- (i) Rework
- (ii) Disposal of scrap
- (iii) Warranty Repairs
- (iv) Revenue loss
- (v) Repair to manufacturing equipments
- (vi) Discount on defective sale
- (vii) Raw material inspection
- (viii) Finished product inspection
- (ix) Establishment of quality circles
- (x) Packaging inspection

(5 Marks)(November, 2011)

Answer

| | | |
|------|------------------------------------|------------------|
| i | Rework | Internal Failure |
| ii | Disposal of Scrap | Internal Failure |
| iii | Warranty Repairs | External Failure |
| iv | Revenue Loss | External Failure |
| v | Repairs to Manufacturing Equipment | Internal Failure |
| vi | Discount on Defective Sales | External Failure |
| vii | Raw Material Inspection | Prevention Cost |
| viii | Finished Product Inspection | Appraisal Cost |
| ix | Establishment of Quality Circles | Prevention Cost |
| X | Packaging Inspection | Appraisal Cost |

Question 57

Briefly explain the phases in the life cycle of a product.

(4 Marks)(November, 2011)

Answer

Phases in Life Cycle of a Product

| Phase | Characteristics |
|--------------|---|
| Introduction | Product is launched. Profits are almost non-existent. Competition is almost negligible. |

| | |
|------------------------|---|
| Growth | Sales/ Profits rise rapidly. Competition enters. At phase end, profits begin to decline. |
| Maturity | Sales increases but at a declining rate. Some firms extend their product lines with new models. |
| Saturation and decline | Drop in sales volume, need for product demand disappears. Better and cheaper substitutes are available in the market. |

Question 58

Explain the concept of Just In time approach in a production process.

(4 Marks) (November, 2011)

Answer

Just in Time in Production Process

1. Products, Spare parts/materials are received directly at production floor. Inspection is completed before delivery of materials.
2. Setup time is minimized while also reducing long production runs, thereby eliminating defectives, scrap and product obsolescence.
3. Work-in-progress is reduced by use of kanban card or working cells or both.
4. Workers are trained on a variety of machines, allowed to stop machines when they identify a problem, fix it or call the repair team and adequately compensated.
5. Supporting systems such as administration, accounting and cost reporting are suitably modified to shift from the conventional mode to the improved JIT requirements.

Question 59

State whether each of the following independent activities is value-added or non-value-added:

- (i) Polishing of furniture used by a systems engineer in a software firm.*
- (ii) Maintenance by a software company of receivables management software for a banking company.*
- (iii) Painting of pencils manufactured by a pencil factory.*
- (iv) Cleaning of customers' computer key boards by a computer repair centre.*
- (v) Providing, brake adjustments in cars received for service by a car service station.*

(5 Marks)(May, 2012)

Answer

| Sl. No | Item | |
|--------|--|-----------------|
| i) | Polishing furniture used by a Systems Engineer in a software firm | Non-value added |
| ii) | Maintenance by a software company of receivables management software for a banking company | Value-added |
| iii) | Painting of pencils manufactured by a pencil factory | Value-added |
| iv) | Customers' computer key board cleaning by a computer repair centre | Value-added |
| v) | Providing brake adjustments in cars for repairs by a care service station. | Value-added |

Question 60

State with a brief reason whether you would recommend an activity based system of costing in each of the following independent situations:

- (i) Company K produces one product. The overhead costs mainly consist of depreciation.
 - (ii) Company L produces 5 different products using different production facilities.
 - (iii) A consultancy firm consisting of lawyers, accountants and computer engineers provides management consultancy services to clients.
 - (iv) Company S produces two different labour intensive products. The contribution per unit in both products is very high. The BEP is very low. All the work is carried on efficiently to meet the target costs.
- (5 Marks)(May, 2012)**

Answer

| Sl. No | Description | Recommend ABC Yes/No | Reason |
|--------|--|----------------------|--|
| i) | K produces one product. Overhead is mainly depreciation | No | <ul style="list-style-type: none"> • One product situation. For allocation of overhead, ABC is not required. • ABC for cost reduction not beneficial since most of the overhead is depreciation. |
| ii) | L produces 5 different products with different facilities. | Yes | <ul style="list-style-type: none"> • Multi product situation. ABC is required for allocation of overhead. • ABC is necessary for pricing. • Cost drivers are likely to be different. • Cost reduction may be possible. • Production facilities are different. |

| | | | |
|------|--|-----|--|
| iii) | Professional services – lawyers/ accountants/ computer engineers | Yes | <ul style="list-style-type: none"> • Variety of services. Hence ABC is required for cost allocation. • Services are very different. • ABC is necessary for pricing. • Cost reduction possible. |
| iv) | S produces 2 different labour intensive products. High unit contribution and efficient operations. | No | <ul style="list-style-type: none"> • Different products, but labour intensive. Hence, overhead allocation based on readily traceable direct labour cost will be accurate. Hence, ABC not required for cost allocation. • Low BEP level implies low level of fixed cost as a % of sale price or as a % of total cost. • Many fixed cost activity drivers are likely to align with the direct labour costs. Hence not required for cost allocation. • Efficient operation. Hence ABC not required even for cost reduction or ABC management. |

Question 61

Classify the following items under the more appropriate category:

Category (CC) – Cost Control Or Category (CR) – Cost Reduction:

- (i) Costs exceeding budgets or standards are investigated.*
- (ii) Preventive function*
- (iii) Corrective function*
- (iv) Measures to standardize for increasing productivity*
- (v) Provision of proper storage facilities for materials.*
- (vi) Continuous comparison of actual with the standards set.*
- (vii) Challenges the standards set*
- (viii) Value analysis*

(4 Marks)(May, 2012)

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Answer

Classification of items under cost reduction/ cost control

| Sl. No. | Item | Category Cost Control (CC) Cost Reduction (CR) |
|---------|--|--|
| (i) | Costs exceeding budgets or standards are investigated | CC |
| (ii) | Preventive function | CC |
| (iii) | Corrective function | CR |
| (iv) | Measures to standardize for increasing productivity | CR |
| (v) | Provision of proper storage facilities for materials | CC |
| (vi) | Continuous comparison of actual with the standards set | CC |
| (vii) | Challenges the standards set | CR |
| (viii) | Value analysis | CR |

Question 62

PQR Limited sells two versions: Deluxe and Premium of its only product GoGo Juicer. The GoGo Juicer uses patented technology to extract the last drop of juice from most fruits. The 'Premium' version can handle larger fruit and has more options relative to the 'Deluxe' version. The following table provides the financial results of the most recent year of operations:

| Particulars | Deluxe 90,000 units | Premium 10,000 units | Total 1,00,000 units |
|--|------------------------------------|-------------------------------------|-------------------------------------|
| Revenue (₹) | 63,00,000 | 9,00,000 | 72,00,000 |
| Material cost (₹) | 10,80,000 | 2,50,000 | 13,30,000 |
| Direct labour cost (₹) | 14,40,000 | 1,60,000 | 16,00,000 |
| Contribution margin (₹) | 37,80,000 | 4,90,000 | 42,70,000 |
| Allocated fixed manufacturing overhead (₹) | 34,20,000 | 3,80,000 | 38,00,000 |
| Allocated fixed selling and administrative overheads (₹) | 2,51,563 | 35,937 | 2,87,500 |
| Profit margin (₹) | 1,08,437 | 74,063 | 1,82,500 |
| Profit margin per unit (₹) | 1.2048 | 7.4063 | |

Labour cost is ₹ 16 per hour and each product requires one hour of labour. The company currently allocates all fixed manufacturing overheads, using labour hours as the allocation

basis. It allocates fixed selling and administrative overheads, using revenue as the allocation base.

Although the profit margin per unit of 'Deluxe' juicer is rather low, PQR Limited believes that it is important to keep this model in the product mix. However, PQR can tailor its promotion and sales strategies to improve the sales mix to 16:4 ratio from the current 9:1 ratio of 'Deluxe' to 'Premium' juicers, with total volume staying at 1,00,000 units.

PQR Limited finds that ₹ 1.1 million of the ₹ 3.8 million of fixed manufacturing overheads pertains to batch related activities such as scheduling production runs. Similarly, ₹ 1,15,000 is the amount of administrative overheads out of the ₹ 2,87,500 of selling and administrative overheads.

It is found that the 'premium' juicer is produced in smaller batches (250 units per batch) than that of 'Deluxe' juicer (500 units per batch). Similarly, it takes 10 sales visits to sell 1,000 units of the 'Deluxe' juicer, while it takes 25 visits to sell 1,000 units of 'Premium' juicer.

Required:

- (i) Prepare a profitability statement based on the proposed sales mix, using the most appropriate basis of allocating fixed overheads.
(In absence of an appropriate basis, do not allocate overheads to products)
- (ii) Advise the company on whether it should go ahead with the propose change in sales mix. (10 Marks)(Nov 2012)

Answer

- (i) Profitability Statement New Mix -Most Appropriate Basis

| Particulars | Deluxe 80,000 Units | | Premium 20,000 Units | | Total (₹) |
|---|------------------------|---------------|-------------------------|---------------|--------------|
| | Per Unit (₹) | Amount (₹) | Per Unit (₹) | Amount (₹) | |
| Revenue | 70.00 | 56,00,000.00 | 90.00 | 18,00,000.00 | 74,00,000.00 |
| Material Cost | 12.00 | 9,60,000.00 | 25.00 | 5,00,000.00 | 14,60,000.00 |
| Direct Labour Cost (One hour per unit) 80,000 Hrs., 20,000 hrs. | 16.00 | 12,80,000.00 | 16.00 | 3,20,000.00 | 16,00,000.00 |
| Contribution Margin | 42.00 | 33,60,000.00 | 49.00 | 9,80,000.00 | 43,40,000.00 |
| Unit related Fixed Mfg. Overheads (Allocation on the basis of direct labour hours) 80,000:20,000 [W.N. 1] | | 21,60,000.00 | | 5,40,000.00 | 27,00,000.00 |

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| | | | |
|---|-------------|-------------|--------------|
| Batch- related Fixed Mfg. Overheads (Allocation on the basis no. of batches) 160:80 [W.N. 1 & 4] | 7,33,333.33 | 3,66,666.67 | 11,00,000.00 |
| Fixed Selling Overheads (Allocated on the basis of sales visits) 800:500 [W.N. 2 & 3] | 1,06,153.85 | 66,346.15 | 1,72,500.00 |
| Profit Margin Ex Admin Overheads Admin Overheads [W.N. 2] | 3,60,512.82 | 6,987.18 | 3,67,500.00 |
| Profit Margin | | | 2,52,500.00 |

Working Note

W.N.1

| | ₹ |
|---|--------------|
| Fixed Mfg. Overheads | 38,00,000.00 |
| Less: Related to batch related activities | 11,00,000.00 |
| Fixed Mfg. Overheads– unit related | 27,00,000.00 |

W.N.2

| | ₹ |
|---------------------------|-------------|
| Selling & Admn. Overheads | 2,87,500.00 |
| Less: Admn. Overhaeds | 1,15,000.00 |
| Selling Overheads | 1,72,500.00 |

W.N.3

| No. of Visits | 10 Sales Visit for 1,000 Units (Deluxe) | 25 Sales Visit for 1,000 Units (Premium) | Total |
|------------------------------|---|--|-------|
| For Proposed Mix-Sales Visit | 800 | 500 | 1,300 |

W.N.4

| No. of Batches | 1 Batch for 500 Units (Deluxe) | 1 Batch for 250 Units (Premium) | Total |
|--------------------------|--------------------------------|---------------------------------|-------|
| For Proposed Mix-Batches | 160 | 80 | 240 |

- (ii) Change in product mix, yields profit of ₹ 70,000/- (₹ 2,52,500 - ₹ 1,82,500). Accordingly company should go with proposed change mix.

☞ This problem can be solved by assuming that some portion of the fixed cost as fixed with respect to units of production, but variable with respect to certain activities. When the production size is altered, these activities are increased and therefore, the activity cost varies for the proposed production level. More batches of production and more sales visits will set off the incremental contribution.

Question 63

In the context of Activity Based Costing System, explain the following statement:

"Strategic cost analysis should exploit internal linkages" (4 Marks) (November, 2012)

Answer

Activity based costing is an accounting methodology that assigns cost to activities rather than to products or services. Activity based Costing tracks the flow of activities by creating internal link between activity/resource consumption and cost object. Exploiting internal linkages means taking advantage of the relationships among the activities that exist within a firm's segment of value chain. Activity cost and analysis are essential parts of this strategic analysis. Activities not based on production units/sales units, based on the variable activity drivers are analyzed. The traditional costing system is not rich enough to supply the information needed for thorough analysis of linkages.

Question 64

What is target costing? It is said that target costing fosters team work within the organisation. Explain how target costing creates an environment in which team work fosters.

(4 Marks)(November, 2012)

Answer

Target cost is the difference between the estimated selling price of a proposed product with specified functionality and quality and target margin. This is a cost management technique that aims to produce and sell products that will ensure the target margin. It is an integral part of the product design. While designing the product the company allocates value and cost to different attributes and quality. Therefore, they use the technique of value engineering and value analysis. The target cost is achieved by assigning cost reduction targets to different operations that are involved in the production process. Eventually, all operations do not achieve the cost reduction targets, but the overall cost reduction target is achieved through team work. Therefore, it is said that target costing fosters team work.

Question 65

What qualitative factors should be considered in an decision to outsource manufacturing of a product? (4 Marks)(November, 2012)

Answer

The following qualitative factors should be considered in an outsourcing decision:

- (i) Whether the vendor will acquire the technology and will emerge as a competitor?
- (ii) Whether the vendor will be able to maintain the quality? If the vendor fails to maintain the quality, will the company lose customers?
- (iii) Whether the company will lose its skills in manufacturing the product and it will find difficult to resume production internally?
- (iv) Whether laying off employees will demoralize the work force?
- (v) Whether the price quoted by the vendor is a penetrating price? If so, it is likely to increase i.e. Whether price will increase.

Question 66

Brief the principles associate with synchronous manufacturing. (4 Marks)(November, 2012)

Answer

Synchronous Manufacturing: In an all-encompassing management philosophy which includes a set of principles, procedures and techniques where every action is evaluated in terms of common goals of the organization.

The seven principles are:

- (i) Focus on synchronizing the production flow than on idle capacities.
- (ii) Value of time at a bottleneck resource is equal to the throughput rate of products processed by the bottleneck.
- (iii) Value of time at a non-bottleneck resource is negligible.
- (iv) Level of utilization of a non-bottleneck resource is controlled by other constraints within the system.
- (v) Resources must be utilized, not simply activated.
- (vi) Transfer batch should not be equal to process batch.
- (vii) A process batch should be variable both along its route and overtime.

Question 67

DEF Bank operated for years under the assumption that profitability can be increased by increasing Rupee volumes. But that has not been the case. Cost analysis has revealed the following:

| <i>Activity</i> | <i>Activity Cost (₹)</i> | <i>Activity Driver</i> | <i>Activity Capacity</i> |
|------------------------------|--------------------------|----------------------------|--------------------------|
| <i>Providing ATM service</i> | <i>1,00,000</i> | <i>No. of transactions</i> | <i>2,00,000</i> |
| <i>Computer processing</i> | <i>10,00,000</i> | <i>No. of transactions</i> | <i>25,00,000</i> |

| | | | |
|--------------------|----------|-------------------|----------|
| Issuing Statements | 8,00,000 | No. of statements | 5,00,000 |
| Customer inquiries | 3,60,000 | Telephone minutes | 6,00,000 |

The following annual information on three products was also made available:

| | Checking Accounts | Personal Loans | Gold Visa |
|-----------------------|-------------------|----------------|-----------|
| Units of product | 30,000 | 5,000 | 10,000 |
| ATM transactions | 1,80,000 | 0 | 20,000 |
| Computer transactions | 20,00,000 | 2,00,000 | 3,00,000 |
| Number of statements | 3,00,000 | 50,000 | 1,50,000 |
| Telephone minutes | 3,50,000 | 90,000 | 1,60,000 |

Required:

- (i) Calculate rates for each activity.
- (ii) Using the rates computed in requirement (i), calculate the cost of each product.

(8 Marks)(May, 2013)

Answer

Calculation showing Rates for each Activity

| Activity | Activity Cost [a] (₹) | Activity Driver | No. of Units of Activity Driver [b] | Activity Rate [a] / [b] (₹) |
|-----------------------|-----------------------------|------------------------------|---|-----------------------------------|
| Providing ATM Service | 1,00,000 | No. of ATM Transactions | 2,00,000 | 0.50 |
| Computer Processing | 10,00,000 | No. of Computer Transactions | 25,00,000 | 0.40 |
| Issuing Statements | 8,00,000 | No. of Statements | 5,00,000 | 1.60 |
| Customer Inquiries | 3,60,000 | Telephone Minutes | 6,00,000 | 0.60 |

Calculation showing Cost of each Product

| Activity | Checking Accounts (₹) | Personal Loans (₹) | Gold Visa (₹) |
|-----------------------|--------------------------------------|-----------------------------------|-------------------------------------|
| Providing ATM Service | 90,000 (1,80,000 tr. x ₹ 0.50) | - | 10,000 (20,000 tr. x ₹ 0.50) |
| Computer Processing | 8,00,000 (20,00,000 tr. x ₹ 0.40) | 80,000 (2,00,000 tr. x ₹ 0.40) | 1,20,000 (3,00,000 tr. x ₹ 0.40) |
| Issuing Statements | 4,80,000 (3,00,000 tr. x ₹ 1.60) | 80,000 (50,000 tr. x ₹ 1.60) | 2,40,000 (1,50,000 tr. x ₹ 1.60) |

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| | | | |
|------------------------------|-------------------------------------|---------------------------------|-----------------------------------|
| Customer Inquiries | 2,10,000 (3,50,000 tr. x ₹ 0.60) | 54,000 (90,000 tr. x ₹ 0.60) | 96,000 (1,60,000 tr. x ₹ 0.60) |
| Total Cost [a] | ₹ 15,80,000 | ₹ 2,14,000 | ₹ 4,66,000 |
| Units of Product [b] | 30,000 | 5,000 | 10,000 |
| Cost of each Product [a]/[b] | 52.67 | 42.80 | 46.60 |

Question 68

Gupta Ltd. produces 4 products P, Q, R and S by using three different machines X, Y and Z. Each machine capacity is limited to 6,000 hours per month. The details given below are for July, 2013:

| | P | Q | R | S |
|-----------------------------|--------|-------|-------|-------|
| Selling price p.u. (₹) | 10,000 | 8,000 | 6,000 | 4,000 |
| Variable cost p.u. (₹) | 7,000 | 5,600 | 4,000 | 2,800 |
| Machine hours required p.u. | | | | |
| Machine X | 20 | 12 | 4 | 2 |
| Machine Y | 20 | 18 | 6 | 3 |
| Machine Z | 20 | 6 | 2 | 1 |
| Expected Demand (units) | 200 | 200 | 200 | 200 |

Required:

- (i) Find out the bottleneck activity.
- (ii) Allocate the machine hours on the basis of the bottleneck.
- (iii) Ascertain the profit expected in the month if the monthly fixed cost amounts to ₹ 9,50,000.
- (iv) Calculate the unused spare hours of each machine. (8 Marks)(May, 2013)

Answer

(i)

| Machine | Time Required for Products (Hours) | | | | Total Time | Time Available | Machine Utilization |
|---------|------------------------------------|---------------------------------|------------------------------|------------------------------|------------|----------------|---------------------|
| | P | Q | R | S | | | |
| X | 4,000 (200 units x 20 hours) | 2,400 (200 units x 12 hours) | 800 (200 units x 4 hours) | 400 (200 units x 2 hours) | 7,600 | 6,000 | 126.67% |

| | | | | | | | |
|---|---------------------------------|---------------------------------|--------------------------------|------------------------------|-------|-------|---------|
| Y | 4,000 (200 units x 20 hours) | 3,600 (200 units x 18 hours) | 1,200 (200 units x 6 hours) | 600 (200 units x 3 hours) | 9,400 | 6,000 | 156.67% |
| Z | 4,000 (200 units x 20 hours) | 1,200 (200 units x 6 hours) | 400 (200 units x 2 hours) | 200 (200 units x 1 hours) | 5,800 | 6,000 | 96.67% |

Since Machine Y has the *highest machine utilization* it represents the bottleneck activity. Hence Product Ranking & Resource Allocation should be based on Contribution/Machine Hour of Machine Y.

(ii)

| Allocation of Resources | | | | | | |
|---------------------------------------|--------------------------------|-----------------------------------|-------------------------------|-----------------------------|---------------------|----------------|
| Particulars | P | Q | R | S | Machine Utilization | Spare capacity |
| Selling Price <i>per unit</i> (₹) | 10,000 | 8,000 | 6,000 | 4,000 | | |
| Variable Cost <i>per unit</i> (₹) | 7,000 | 5,600 | 4,000 | 2,800 | | |
| Contribution <i>per unit</i> (₹) | 3,000 | 2,400 | 2,000 | 1,200 | | |
| Time Required in Machine 'Y' (hrs.) | 20 | 18 | 6 | 3 | | |
| Contribution per Machine Hour (₹) | 150 | 133.33 | 333.33 | 400 | | |
| Rank | III | IV | II | I | | |
| Allocation of Machine 'Y' time (hrs.) | 4,000 (200 units x 20 hrs.) | 200 (Balance) | 1,200 (200 units x 6 hrs.) | 600 (200 units x 3 hrs.) | 6,000 | |
| Production (units) | 200 | 11.11 (200 hrs. / 18 hrs.) | 200 | 200 | | |
| Allocation of Machine 'X' time (hrs.) | 4,000 (200 units x 20 hrs.) | 133.32 (11.11 units x 12 hrs.) | 800 (200 units x 4 hrs.) | 400 (200 units x 2 hrs.) | 5,333.32 | 666.68 |
| Allocation of Machine 'Z' time (hrs.) | 4,000 (200 units x 20 hrs.) | 66.66 (11.11 units x 6 hrs.) | 400 (200 units x 2 hrs.) | 200 (200 units x 1 hrs.) | 4,666.66 | 1,333.34 |

(iii) Calculation of Expected Profit

| Particulars | Amount (₹) |
|---------------------------|------------|
| P (200 units x ₹ 3,000) | 6,00,000 |
| Q (11.11 units x ₹ 2,400) | 26,664 |

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| | |
|-------------------------|-----------|
| R (200 units x ₹ 2,000) | 4,00,000 |
| S (200 units x ₹ 1,200) | 2,40,000 |
| Total Contribution | 12,66,664 |
| Less: Fixed Cost | 9,50,000 |
| Expected Profit | 3,16,664 |

(iv) Unused Spare Hours

Machine 'X'

| <i>Particulars</i> | <i>Amount (₹)</i> |
|------------------------------|-----------------------|
| Machine Hours Available | 6,000.00 hrs. |
| Less: Machine Hours Utilized | 5,333.32 hrs. |
| Spare Hours | 666.68 hrs. |

Machine 'Z'

| <i>Particulars</i> | <i>Amount (₹)</i> |
|------------------------------|-----------------------|
| Machine Hours Available | 6,000.00 hrs. |
| Less: Machine Hours Utilized | 4,666.66 hrs. |
| Spare Hours | 1,333.34 hrs. |

☞ While calculating Production (units) of Product 'Q' on the basis of allocated hours, round figure (complete units) can also be considered and rest of the solution will be changed accordingly.

Question 69

*What are the focuses of Theory of Constraints ? How it differs with regard to cost behavior ?
(4 Marks)(May, 2013)*

Answer

The theory of constraint focuses its attention on constraints and bottlenecks within the organisation which hinder speedy production. The main concept is to maximize the rate of manufacturing output i.e. the throughput of the organisation. This requires examining the bottlenecks and constraints which are defined as:

- A bottleneck is an activity within the organisation where the demand for that resource is more than its capacity to supply.
- A constraint is a situational factor which makes the achievement of objectives/throughput more difficult than it would otherwise be. Constraints may take several forms such as lack

of skilled employees, lack of customer orders or the need to achieve a high level of quality product output.

Using above definition, therefore, a bottleneck is always a constraint but a constraints need not be a bottleneck.

The theory of constraints assumes few costs are variable –generally materials, purchased parts, piecework labour, and energy to run machines. It assumes that most direct labour and overheads are fixed. This is consistent with the idea that the shorter the time period, the more costs are fixed, and the idea that the theory of constraints focuses on the short run.

Question 70

The following independent situations are given in JIT systems of production. You are required to state if each recommendation is valid or invalid and give a brief reason.

| Sl. No. | Situation | Recommendation by the Cost Accountant |
|---------|--|--|
| (i) | A company produces LCD TVs. Presently total inventory turnover is measured annually. | Compute inventory turnover every month. Break it down into raw material, WIP, expensive inventory and finished goods. |
| (ii) | Textile company. | Accept employees' claim for piece rate incentive for exceeding a certain production volume. |
| (iii) | Sports goods manufacturing company. | Closely monitor direct labour variances including idle time variances to convince employees to work faster. |
| (iv) | Multiproduct production | Monitor the average set up time per machine in a period which is given by <u>Aggregate set up time of all machines</u> Total number of machines. |

(4 Marks)(November, 2013)

Answer

| Situation | Valid / Invalid |
|-----------|---|
| (i) | A company produces LCD TVs. Presently total inventory turnover is measured annually. Valid - JIT system emphasize extraordinary high inventory turnover. When a company is producing LCD TVs, total turnover of inventory will be high, when the recommendation of computing of inventory turnover and breaking it into raw material, W-I-P and finished goods is given JIT system is very much valid. |
| (ii) | Textile company. Invalid - In textile industry, employees are paid extra if they exceed certain production volume targets. JIT focuses on producing only what is needed not to accumulate inventory |

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| | | |
|-------|-------------------------------------|--|
| | | on account of high incentives. So any piece rate system must be eliminated and replaced with measures that focus instead on the quality of output or the number of employee suggestions for improving the system, which are much more important outcomes in a JIT system. |
| (iii) | Sports goods manufacturing company. | Invalid - Monitoring Direct labour efficiency is highly inappropriate in JIT system. As JIT system unlike traditional system does not focus on fast workings of employees. Instead JIT focuses on quality of product manufactured. JIT system strives to avoid all unnecessary activities and hence eliminate non-value-added activities like monitoring direct labour variance including idle variance. |
| (iv) | Multiproduct production. | Invalid - The average setup time per machine is of great importance as it can be measured periodically and plotted on a trend line. The shortest possible setup intervals are crucial for the success of short production runs, so this is a major JIT measurement. It is best to measure it by machine, rather than in the aggregate, since an aggregate measure does not reveal enough information about which equipments requires more setup time reduction work. |

 Conceptual correct brief reason along with the validity of recommendation (valid or invalid) is sufficient.

Question 71

MK Ltd. manufactures four products, namely A, B, C and D using the same plant and process. The following information relates to a production period:

| <i>Product</i> | <i>A</i> | <i>B</i> | <i>C</i> | <i>D</i> |
|------------------------|------------|------------|------------|------------|
| <i>Output in Units</i> | <i>720</i> | <i>600</i> | <i>480</i> | <i>504</i> |

The four products are similar and are usually produced in production runs of 24 units and sold in batches of 12 units. The total overheads incurred by the company for the period are as follows:

| | <i>₹</i> |
|---|---------------|
| <i>Machine operation and maintenance cost</i> | <i>63,000</i> |
| <i>Setup costs</i> | <i>20,000</i> |
| <i>Store receiving</i> | <i>15,000</i> |
| <i>Inspection</i> | <i>10,000</i> |
| <i>Material handling and dispatch</i> | <i>2,592</i> |

During the period the following cost drivers are to be used for the overhead cost:

| | |
|---------------------------------------|-------------------------------|
| <i>Cost</i> | <i>Cost driver</i> |
| <i>Setup cost</i> | <i>No. of production runs</i> |
| <i>Store receiving</i> | <i>Requisitions raised</i> |
| <i>Inspection</i> | <i>No. of production runs</i> |
| <i>Material handling and dispatch</i> | <i>Orders executed</i> |

It is also determined that:

- Machine operation and maintenance cost should be apportioned between setup cost, store receiving and inspection activity in the ratio 4: 3: 2.
- Number of requisition raised on store is 50 for each product and the no. of orders executed is 192, each order being for a batch of 12 units of a product.

Calculate the total overhead cost per unit of each product using activity based costing after finding activity wise overheads allocated to each product. **(8 Marks)(November, 2013)**

Answer

Statement Showing Overhead Cost *per unit*

| Particulars | A (₹) | B (₹) | C (₹) | D (₹) |
|--------------------------------|---|---|---|---|
| Setup | 15,000 $\left[\frac{720\text{units}}{24\text{units}} \times ₹500 \right]$ | 12,500 $\left[\frac{600\text{units}}{24\text{units}} \times ₹500 \right]$ | 10,000 $\left[\frac{480\text{units}}{24\text{units}} \times ₹500 \right]$ | 10,500 $\left[\frac{504\text{units}}{24\text{units}} \times ₹500 \right]$ |
| Store Receiving | 9,000 [50Req.x₹180] | 9,000 [50Req.x₹180] | 9,000 [50Req.x₹180] | 9,000 [50Req.x₹180] |
| Inspection | 7,500 $\left[\frac{720\text{units}}{24\text{units}} \times ₹250 \right]$ | 6,250 $\left[\frac{600\text{units}}{24\text{units}} \times ₹250 \right]$ | 5,000 $\left[\frac{480\text{units}}{24\text{units}} \times ₹250 \right]$ | 5,250 $\left[\frac{504\text{units}}{24\text{units}} \times ₹250 \right]$ |
| Material Handling and Dispatch | 810 $\left[\frac{720\text{units}}{12\text{units}} \times ₹13.5 \right]$ | 675 $\left[\frac{600\text{units}}{12\text{units}} \times ₹13.5 \right]$ | 540 $\left[\frac{480\text{units}}{12\text{units}} \times ₹13.5 \right]$ | 567 $\left[\frac{504\text{units}}{12\text{units}} \times ₹13.5 \right]$ |
| Total Overhead Cost | 32,310 | 28,425 | 24,540 | 25,317 |
| Overhead Cost <i>per unit</i> | 44.875 | 47.375 | 51.125 | 50.232 |

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Workings

Allocation of Machine Operation and Maintenance Cost

| Particulars | Setup | Store Receiving | Inspection |
|---|--------|-----------------|------------|
| Machine operation and maintenance cost of ₹63,000 to be distributed in the ratio of 4: 3: 2 | 28,000 | 21,000 | 14,000 |

Activities, Drivers and Cost

| Activity | Cost (₹) | Drivers | Nos. | Cost <i>per unit</i> of Driver (₹) |
|-------------------------------------|----------|---------------------|------|------------------------------------|
| Setup (₹20,000 + ₹28,000) | 48,000 | Production Runs | 96 | 500.00 |
| Store Receiving (₹15,000 + ₹21,000) | 36,000 | Requisitions Raised | 200 | 180.00 |
| Inspection (₹10,000 + ₹14,000) | 24,000 | Production Runs | 96 | 250.00 |
| Material Handling and Disp. | 2,592 | Orders | 192 | 13.50 |

Note:

Production Run for

| | | |
|------------|---|----|
| A (720/24) | = | 30 |
| B (600/24) | = | 25 |
| C (480/24) | = | 20 |
| D (504/24) | = | 21 |

Question 72

In Value Chain analysis, business activities are classified into primary activities and support activities. Classify the following under the more appropriate activity.

- (i) *Order processing and distribution*
- (ii) *Installation, repair and parts replacement*
- (iii) *Purchase of raw material and other consumable stores*
- (iv) *Transforming inputs into final products*
- (v) *Selection, promotion, appraisal and employee relations*
- (vi) *Material handling and warehousing*
- (vii) *General management, planning, finance, accounting*
- (viii) *Communication, pricing and channel management*

(4 Marks)(November, 2013)

Answer

| Activity | | Primary Activity/Support Activity |
|----------|--|-----------------------------------|
| (i) | Order processing and distribution | Primary Activity |
| (ii) | Installation, repair and parts replacement | Primary Activity |
| (iii) | Purchase of raw material and other consumable stores | Support Activity |
| (iv) | Transforming inputs into final products | Primary Activity |
| (v) | Selection, promotion, appraisal and employee relations | Support Activity |
| (vi) | Material handling and warehousing | Primary Activity |
| (vii) | General management, planning, finance, accounting | Support Activity |
| (viii) | Communication, pricing and channel management | Primary Activity |

Question 73

State the type of cost in the following cases:

- (i) *Cost associated with the acquisition and conversion of material into finished product.*
- (ii) *Cost arising from a prior decision which cannot be changed in the short run.*
- (iii) *Increase in cost resulting from selection of one alternative instead of another.*
- (iv) *Rent paid for a factory building which is temporarily closed. (4 Marks)(November, 2013)*

Answer

| Cases | Type of Cost |
|--|-------------------------------|
| (i) Cost associated with the acquisition and conversion of material into finished product. | Product Cost |
| (ii) Cost arising from a prior decision which cannot be changed in the short run. | Committed Cost |
| (iii) Increase in cost resulting from selection of one alternative instead of another. | Differential/Incremental Cost |
| (iv) Rent paid for a factory building which is temporarily closed. | Shut Down Cost |

Question 74

A Ltd. is going to introduce Total Quality Management (TQM) in its company. State whether and why the following are valid or not for the successful implementation of TQM.

- (i) *Some departments serve both the external and internal customers. These departments have been advised to focus on satisfying the needs of the external customers.*

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- (ii) Hold a training program at the beginning of a production cycle to ensure the implementation of TQM.
- (iii) Implement Management by Objectives for faster achievement of TQM.
- (iv) Appoint the Head of each department as the person responsible to develop improvement strategies and performance measures.
- (v) Eliminate wastage of time by avoiding documentation and procedures. (5 Marks) (May, 2014)

Answer

| Point | Valid/ Invalid | Reason |
|-------|----------------|--|
| (i) | Invalid | TQM advocates focus to be given on both external and internal customers. Hence, focus satisfying the needs of the external customers only will not be valid for the successful implementation of TQM. |
| (ii) | Valid | Training at the beginning would improve productivity by bringing standardization in work habits and eliminating variations in production. |
| (iii) | Invalid | For implementation of TQM, Management by Objectives should be eliminated as targets of production will encourage delivery of poor quality goods and thus will defeat the collective nature of TQM. |
| (iv) | Invalid | Appointing the head of each department as the responsible person is not valid for the successful implementation of TQM as Total Employee Involvement (TIE) principle is an important part of TQM. |
| (v) | Invalid | Documentation, procedures and awareness of current best practice are essential in TQM implementation. If documentation and procedures are in place then only improvement can be monitored & measured and consequently deficiency can be corrected. |

 Conceptually correct brief reason along with the validity of recommendation (Valid or Invalid) is sufficient.

Question 75

PQR Ltd. specializes in the distribution of pharmaceutical products. It buys from pharmaceutical companies and resells to each of the three different markets:

- (i) General Supermarket Chains
- (ii) Drug Store Chains
- (iii) Chemist Shops

The company plans to use activity based costing for analyzing the profitability of its distribution channels. The following data for the quarter ending March 2014 is given:

| | General Supermarket Chains | Drug Store Chains | Chemist Shops |
|--|----------------------------|-------------------|---------------|
| Average sales per delivery | ₹ 96,500 | ₹ 32,450 | ₹ 6,225 |
| Average cost of goods sold per delivery | ₹ 94,650 | ₹ 31,800 | ₹ 5,950 |
| Number of deliveries | 960 | 2,470 | 8,570 |
| Total number of orders | 1,000 | 2,650 | 9,500 |
| Average number of cartons shipped per delivery | 250 | 75 | 12 |
| Average number of hours of shelf stocking per delivery | 2 | 0.5 | 0.1 |

The following information is available in respect of operating costs (other than cost of goods sold) for the quarter ending March 2014:

| Activity Area | Cost Driver | Total Cost (₹) |
|---------------------------------------|---|----------------|
| Customer purchase order processing | Purchase order by customers | 5,91,750 |
| Customer store delivery | Number of deliveries | 9,60,000 |
| Cartons dispatched to customer stores | Number of Cartons dispatched to customer stores | 7,92,135 |
| Shelf stocking at customer store | Hours of shelf stocking | 80,240 |

Compute the operating income of each distribution channel for the quarter ending March 2014 using activity based costing. (8 Marks) (May, 2014)

Answer

Statement Showing Operating Income of Distribution Channels of PQR Ltd.

| Particulars | General Supermarket Chains (₹) | Drug Store Chains (₹) | Chemist Shops (₹) | Total (₹) |
|--|--------------------------------|----------------------------------|---------------------------------|--------------|
| Sales (Number of Deliveries × Average Sales per delivery) | 9,26,40,000 (960 × ₹96,500) | 8,01,51,500 (2,470 × ₹32,450) | 5,33,48,250 (8,570 × ₹6,225) | 22,61,39,750 |
| Less: Cost of Goods Sold (Number of Deliveries × Average Cost of Goods Sold per delivery) | 9,08,64,000 (960 × ₹94,650) | 7,85,46,000 (2,470 × ₹31,800) | 5,09,91,500 (8,570 × ₹5,950) | 22,04,01,500 |
| Gross Margin | 17,76,000 | 16,05,500 | 23,56,750 | 57,38,250 |

1.78 Advanced Management Accounting

| | | | | |
|-----------------------|-----------|----------|-----------|-----------|
| Less: Operating Costs | 5,20,200 | 6,19,425 | 12,84,500 | 24,24,125 |
| Operating Income | 12,55,800 | 9,86,075 | 10,72,250 | 33,14,125 |

Workings:

Statement Showing Operating Cost of Distribution Channels of PQR Ltd.

| Particulars | General Supermarket Chains (₹) | Drug Store Chains (₹) | Chemist Shops (₹) | Total (₹) |
|---------------------------------------|-----------------------------------|-------------------------------|-------------------------------|--------------|
| Customer Purchase Order Processing | 45,000 (₹45 × 1,000) | 1,19,250 (₹45 × 2,650) | 4,27,500 (₹45 × 9,500) | 5,91,750 |
| Customer Store Delivery | 76,800 (₹80 × 960) | 1,97,600 (₹80 × 2,470) | 6,85,600 (₹80 × 8,570) | 9,60,000 |
| Cartons Dispatched to Customer Stores | 3,60,000 (₹1.5 × 2,40,000) | 2,77,875 (₹1.5 × 1,85,250) | 1,54,260 (₹1.5 × 1,02,840) | 7,92,135 |
| Shelf Stocking at Customer Store | 38,400 (₹20 × 1,920) | 24,700 (₹20 × 1,235) | 17,140 (₹20 × 875) | 80,240 |
| | 5,20,200 | 6,19,425 | 12,84,500 | 24,24,125 |

Computation of Rate Per Unit of Cost Allocation Base

| Activity | Activity Cost [a] (₹) | Activity Driver | No. of Units of Activity Driver [b] | Cost Driver Rate [a] / [b] (₹) |
|---------------------------------------|-----------------------------|---|--|--------------------------------------|
| Customer Purchase Order Processing | 5,91,750 | Purchase Order by Customers | 13,150 | 45.00 |
| Customer Store Delivery | 9,60,000 | Number of Deliveries | 12,000 | 80.00 |
| Cartons Dispatched to Customer Stores | 7,92,135 | Number of Cartons Dispatched to Customer Stores | 5,28,090 | 1.50 |
| Shelf Stocking at Customer Store | 80,240 | Hours of Shelf Stocking | 4,012 | 20.00 |

No. of Units of Activity Driver

$$\begin{aligned} \text{Purchase Order by Customers} &= 1,000 + 2,650 + 9,500 \\ &= 13,150 \end{aligned}$$

$$\begin{aligned}
 \text{Number of Deliveries} &= 960 + 2,470 + 8,570 = 12,000 \\
 \text{Number of Cartons Dispatched} &= \text{Number of Deliveries} \times \text{Average Number of} \\
 \text{to Customer Stores} &= \text{Cartons Shipped } \textit{per delivery} \\
 &= (960 \times 250) + (2,470 \times 75) + (8,570 \times 12) \\
 &= 2,40,000 + 1,85,250 + 1,02,840 \\
 &= 5,28,090 \\
 \text{Hours of Shelf Stocking} &= \text{Number of Deliveries} \times \text{Average Number of} \\
 &= \text{Hours of Shelf Stocking } \textit{per delivery} \\
 &= (960 \times 2.0) + (2,470 \times 0.5) + (8,570 \times 0.1) \\
 &= 1,920 + 1,235 + 857 \\
 &= 4,012
 \end{aligned}$$

Question 76

Classify the following items appropriately under the three measures used in the Theory of Constraints:

- (i) *Research and Development Cost*
- (ii) *Rental/Utilities*
- (iii) *Finished Goods Inventory*
- (iv) *Depreciation*
- (v) *Labour Cost*
- (vi) *Stock of Raw Materials*
- (vii) *Sales*
- (viii) *Cost of Equipment and Buildings*

(4 Marks) (May, 2014)

Answer

| Three Measures of Theory of Constraints | Item |
|---|---------------------------------------|
| Throughput Contribution | (vii) Sales |
| Investments | (i) Research and Development Cost |
| | (iii) Finished Goods Inventory |
| | (vi) Stock of Raw material |
| | (viii) Cost of Equipment and Building |
| Operating Costs | (ii) Rent/Utilities |
| | (iv) Depreciation |
| | (v) Labour Cost |

Question 77

A company manufactures several products of varying designs and models. It uses a single overhead recovery rate based on direct labour hours. The overheads incurred by the Company in the first half of the year are as under:

| | ₹ |
|------------------------------------|-----------|
| Machine operation expenses | 20,25,000 |
| Machine maintenance expenses | 3,75,000 |
| Salaries of technical staff | 12,75,000 |
| Wages and salaries of stores staff | 5,25,000 |

During this period, the company introduced activity based costing system and the following significant activities were identified:

- Receiving materials and components
- Set up of machines for production runs
- Quality inspection

It is also determined that:

- The machine operation and machine maintenance expenses should be apportioned between stores and production activity in 1:4 ratio.
- The technical staff salaries should be apportioned between machine maintenance, set up and quality inspection in 3 : 4 : 3 ratio.

The consumption of activities during the period under review are as under:

- | | |
|--|--------|
| • Direct labour hours worked | 80,000 |
| • Production set-ups | 4,080 |
| • Material and components consignments received from suppliers | 3,920 |
| • Number of quality inspection carried out | 2,560 |

The direct wages rate is ₹ 12 per hour.

The data relating to two products manufactured by the company during the period are as under:

| | | P | Q |
|--|------|--------|-------|
| Direct Materials costs | ₹ | 12,000 | 8,000 |
| Direct labour hours | Hrs. | 960 | 100 |
| Direct Materials Consignments received | nos. | 48 | 52 |
| Production runs | nos. | 36 | 24 |

| | | | |
|-----------------------------------|---------------|--------|-------|
| Number of quality inspection done | nos. | 30 | 10 |
| Quantity Produced | units in nos. | 15,000 | 5,000 |

A potential customer has approached the company for the supply of 24,000 units of a component 'R' to be delivered in lots of 3,000 units per quarter. The job will involve an initial design cost of ₹60,000 and the manufacture will involve the following per quarter.

| | | |
|---|------|--------|
| Direct Material costs | ₹ | 12,000 |
| Direct labour hours | Hrs. | 300 |
| Production runs | nos. | 6 |
| Inspections | nos. | 24 |
| Number of consignments of direct materials to be received | nos. | 20 |

You are required to:

1. Calculate the cost of products P and Q based on the existing system of single overhead Recovery rate.
2. Determine the cost of product P & Q using Activity Based Costing system.
3. Compute the sales values per quarter of components 'R' using Activity Based Costing system. (considering a mark up of 25% on cost) **(10 Marks) (November, 2014)**

Answer

- (i) Statement of Calculation of Unit Cost of Product P & Q on the Existing System

| | P (₹) | Q (₹) |
|---|---------------------------|--------------------------|
| Direct Material | 12,000 | 8,000 |
| Direct Labour Cost | 11,520 (₹12 × 960 hr.) | 1,200 (₹12 × 100 hr.) |
| Overheads (Direct Labour Hours × ₹52.5 per hour) | 50,400 | 5,250 |
| Total Cost | 73,920 | 14,450 |
| Quantity Produced (units) | 15,000 | 5,000 |
| Cost per unit | 4.928 | 2.89 |

$$\begin{aligned} \text{Single Factory Direct Labour Hour Overhead Rate} &= \frac{\text{₹ } 42,00,000}{80,000 \text{ labour hours}} \\ &= \text{₹ } 52.50 \text{ per Direct Labour Hour} \end{aligned}$$

(ii) Workings

| Statement of Apportionment of Overheads | | | | (Amount in ₹) |
|---|--|---|---|---------------|
| Particulars | Receiving Supplies | Setups | Quality Inspection | Total |
| Machine Operation expenses (1 : 4) | 4,05,000 $\left(₹20,25,000 \times \frac{1}{5} \right)$ | 16,20,000 $\left(₹20,25,000 \times \frac{4}{5} \right)$ | -- | 20,25,000 |
| Maintenance (1 : 4) | 1,51,500 $\left(₹7,57,500 \times \frac{1}{5} \right)$ | 6,06,000 $\left(₹7,57,500 \times \frac{4}{5} \right)$ | -- | 7,57,500* |
| Salary of Technical Staff | -- | 5,10,000 $\left(₹12,75,000 \times \frac{4}{10} \right)$ | 3,82,500 $\left(₹12,75,000 \times \frac{3}{10} \right)$ | 8,92,500** |
| Wages & Salary of Stores Staff | 5,25,000 | -- | -- | 5,25,000 |
| Total | 10,81,500 | 27,36,000 | 3,82,500 | 42,00,000 |

$$(*) ₹3,75,000 + \text{Share of Technician's Salary} \left(₹12,75,000 \times \frac{3}{10} \right)$$

$$(**) ₹12,75,000 - \text{Share to Machine Maintenance} \left(₹12,75,000 \times \frac{3}{10} \right)$$

The next stage is to identify the cost drivers for each activity and establish cost driver rates by dividing the activity costs by a measure of cost driver usage for the period.

Computation of Activities Cost Driver Rate

| Overhead Costs | Activity Cost Driver rate |
|--|--------------------------------|
| Receiving Supplies $\left[\frac{₹10,81,500}{3,920} \right]$ | ₹275.89 per consignment |
| Performing Setups $\left[\frac{₹27,36,000}{4,080} \right]$ | ₹670.59 per setup |
| Quality Inspection $\left[\frac{₹3,82,500}{2,560} \right]$ | ₹149.41 per quality inspection |

Finally, costs are assigned to components based on their cost driver usage. The assignments are as follows-

Statement of Determination of the Cost of Product P & Q using
Activity Based Costing System

| Particulars of Costs | P (₹) | Q (₹) |
|------------------------------|----------------------------------|----------------------------------|
| Direct Materials | 12,000 | 8,000 |
| Direct Labour @ ₹12 per hour | 11,520 | 1,200 |
| Receiving Supplies | 13,243 (₹275.89 × 48 Con.) | 14,346 (₹275.89 × 52 Con.) |
| Performing Setups | 24,141 (₹670.59 × 36 Set-ups) | 16,094 (₹670.59 × 24 Set-ups) |
| Quality Inspections | 4,482 (₹149.41 × 30 QI) | 1,494 (₹149.41 × 10 QI) |
| Total Costs | 65,386 | 41,134 |
| No of Units Produced | 15,000 | 5,000 |
| Cost per unit | 4.36 | 8.23 |

(iii) Computation of Sales Value per Quarter of Component 'R' (using ABC)

| Particulars of Costs | Amount (₹) |
|---|--------------------------------|
| Direct Materials | 12,000 |
| Direct Labour (@ ₹12 per hour) | 3,600 (₹12 × 300 Hr.) |
| Initial Design Cost (₹60,000 ÷ 8 Quarter) | 7,500 |
| Receiving Supplies | 5,518 (₹275.89 × 20 Con.) |
| Performing Setups | 4,024 (₹670.59 × 6 Set-ups) |
| Quality Inspections | 3,586 (₹149.41 × 24 QI) |
| Total Costs | 36,228 |
| Add: Margin 25% of ₹36,228 | 9,057 |
| Total Sales Value | 45,285 |

Question 78

How does the JIT approach help in improving an organization's Profitability?

(4 Marks) (November, 2014)

Answer

JIT approach helps in the reduction of costs/increase in prices as follows:

- (i) Immediate detection of defective goods being manufactured so that early correction is ensured with least scrapping.
- (ii) Eliminates / reduces WIP between machines within working cell.
- (iii) Overhead costs in the form of rentals for inventory, insurance, maintenance costs etc. are reduced.
- (iv) Higher product quality ensured by the JIT approach leads to higher premium in the selling price.

Detection of problem areas due to better production / scrap reporting / labour tracing and inventory accuracy lead to reduction in costs by improvement.

Question 79

Briefly explain the phases in the life cycle of a product. (4 Marks) (November, 2014)

Answer**Phases in Life Cycle of a Product-**

| Phase | Characteristics |
|------------------------|---|
| Introduction | Product is launched. Profits are almost nonexistent. Competition is almost negligible. |
| Growth | Sales/ Profits rise rapidly. Competition enters. |
| Maturity | Sales increases but at a declining rate. Some firms extend their product lines with new models. |
| Saturation and Decline | Drop in sales volume, need for product demand disappears. Better and cheaper substitutes are available in the market. |