

15. ACTIVITY BASED COSTING

NO. OF PROBLEMS IN 39E OF CA INTER: CLASSROOM - 6, ASSIGNMENT - 2

NO. OF PROBLEMS IN 40E OF CA INTER: CLASSROOM - 7, ASSIGNMENT - 4

NO. OF PROBLEMS IN 41E OF CA INTER: CLASSROOM - 7, ASSIGNMENT - 6

SIGNIFICANCE OF EACH PROBLEM COVERED IN THIS MATERIAL

| Problem No. in this material | Problem No. in NEW SM | Problem No. in OLD SM | Problem No. in OLD PM | PQ | RTP | MTP | Previous Exams | Remarks |
|------------------------------|-----------------------|-----------------------|-----------------------|----|---------|--------------|----------------|---------|
| CR 1 | - | - | - | 1 | - | - | - | |
| CR 2 | - | - | - | - | - | - | N18 (N)-10M | |
| CR 3 | ILL 1 | - | - | - | - | - | - | |
| CR 4 | ILL 2 | - | - | - | - | - | - | |
| CR 5 | ILL 3 | - | - | - | - | - | - | |
| CR 6 | PQ 1 | - | - | - | - | - | - | |
| CR 7 | PQ 2 | - | - | - | - | - | - | |
| AS 1 | - | - | - | - | - | - | M18 (N) - 10M | |
| AS 2 | - | - | - | - | M18 (N) | - | - | |
| AS 3 | - | - | - | - | - | - | - | |
| AS 4 | - | - | - | - | - | - | - | |
| AS 5 | - | - | - | - | - | M18 (N) - 5M | - | |
| AS 6 | - | - | - | - | M18 (N) | - | - | |

Definition: Activity based costing is an accounting methodology that assigns costs to activities rather than products or services. This enables resources & overhead costs to be more accurately assigned to products & services that consume them.

Steps in ABC include:

- Identification of activities and their respective costs
- Identification of cost driver of each activity and computation of an allocation Rate per activity
- Allocation of overhead cost to products/ services based on the activities involved

MEANING OF TERMS USED IN ABC

- Activity - Activity, here, refers to an event that incurs cost.
- A Cost Object-It is an item for which cost measurement is required e.g. a product or a customer.
- A Cost Driver-It is a factor that causes a change in the cost of an activity. There are two categories of cost driver. Example Production runs
 - A Resource Cost Driver-** It is a measure of the quantity of resources consumed by an activity. It is used to assign the cost of a resource to an activity or cost pool.
 - An Activity Cost Driver-**It is a measure of the frequency and intensity of demand, placed on activities by cost objects. It is used to assign activity costs to cost objects.
- Cost Pool-** It represents a group of various individual cost items. It consists of Costs that have same cause effect relationship. Example: Machine set-up.

Examples of Cost Drivers:

| Business functions | Cost Driver |
|---|--|
| Research and Development | <ul style="list-style-type: none"> Number of research projects Personnel hours on a project |
| Design of products, services and procedures | <ul style="list-style-type: none"> Number of products in design Number of parts per product Number of engineering hours |

| | |
|------------------|---|
| Customer Service | <ul style="list-style-type: none"> • Number of service calls • Number of products serviced • Hours spent on servicing products |
| Marketing | <ul style="list-style-type: none"> • Number of advertisements • Number of sales personnel • Sales revenue |
| Distribution | <ul style="list-style-type: none"> • Number of units distributed • Number of customers |

LEVEL OF ACTIVITIES UNDER ABC METHODOLOGY:

Unit level activities, batch level activities, product level activities and facility level activities are the categories of activities helps to determine the type of activity cost driver required.

STAGES IN ACTIVITY BASED COSTING (ABC):

The different stages in ABC calculations are listed below:

- 1. Identify the different activities within the organization:** Usually the numbers of cost centers that a traditional overhead system uses are quite New Small, say up to fifteen. In ABC the number of activities will be much more, say 200; the exact number will depend on how the management subdivides the organization's activities.

The additional number of activities over cost centers means that ABC should be more accurate than the traditional method regardless of anything else. Some activities may be listed as follows:

- | | |
|--------------------------------|------------------------------|
| a) Production schedule changes | d) Production process set up |
| b) Customer liaison | e) Quality control |
| c) Purchasing | f) Material handling |
| g) Maintenance | |

- 2. Relate the overheads to the activities,**
- 3. Support activities are then spread across the primary activities**
- 4. Determine the activity cost drivers**
- 5. Calculate activity cost driver rates for each activity,** just as an overhead absorption rate would be calculated in the traditional system.

$$\text{Activity cost driver rate} = \frac{\text{Total cost of activity}}{\text{Activity driver}}$$

The activity driver rate can be used to cost products, as in traditional absorption costing, but it can also cost other cost objects such as customers/customer segments and distribution channels. The possibility of costing objects other than products is part of the benefit of ABC. The activity cost driver rates will be multiplied by the different amounts of each activity that each product/other cost object consumes.



Overhead Drivers

Cost Allocation under ABC

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To **MASTER MINDS**, Guntur

PROBLEMS FOR CLASSROOM DISCUSSION

PROBLEM 1: A company manufactures three products namely A, B and C in a factory. The following cost data for the month of March, 20X8 are as under:

| Activity | A | B | C |
|------------------------------|--------|--------|-----------|
| Unit produced | 10,000 | 15,000 | 20,000 |
| Direct labour hour per unit | 3 | 4.5 | 4 |
| Machine hour per unit | 6 | 4 | 5 |
| Set-up of machines | 20 | 25 | 30 |
| Number of orders | 15 | 12 | 10 |
| Machine operating cost (Rs.) | | | 34,50,000 |
| Machine set-up cost (Rs.) | | | 4,36,000 |
| Order processing cost (Rs.) | | | 2,56,000 |

Required:

- i) Identify Cost pool, Cost drivers.
- ii) Calculate cost driver rate.
- iii) Calculate overheads rate per unit using activity- based costing method.

(B) (PQ) (ANS.: II) RATE PER COST DRIVER: RS. 15.68, RS. 5,813.33, RS. 6,918.92; III) O.R.P.U: 78.40, 8.72, 3.46)

(SOLVE PROBLEM NO. 1 OF ASSIGNMENT PROBLEMS AS REWORK)

Note: _____

PROBLEM 2: M/s. HMB Limited is producing a product in 10 batches each of 15,000 units in a year and incurring following overheads their on:

| Particulars | Amount (Rs.) |
|----------------------|--------------|
| Material procurement | 22,50,000 |
| Maintenance | 17,30,000 |
| Set-up | 6,84,500 |
| Quality control | 5,14,800 |

The prime costs for the year amounted to Rs. 3,01,39,000.

The company is using currently the method of absorbing overheads on the basis of prime cost. Now it wants to shift to activity-based costing. Information relevant to Activity drivers for a year are as under:

| Activity Driver | Activity Volume |
|------------------------|-----------------|
| No. of purchase orders | 1500 |
| Maintenance hours | 9080 |
| No. of set-ups | 2250 |
| No. of inspections | 2710 |

The company has produced a batch of 15000 units and has incurred Rs. 26,38,700 and Rs. 3,75,200 on materials and wages respectively.

The usage of activities of the said batch are as follows:

| | |
|--------------------|-----------|
| Materials orders | 48 orders |
| Maintenance hours | 810 hours |
| No. of set-ups | 40 |
| No. of inspections | 25 |

You are required to:

- a) Find out cost of product per unit on absorption costing basis for the said batch.
- b) Determine cost driver rate, total cost and cost per unit of output of the said batch on the basis of activity based costing.

(A) (N18 (N) - 10M)

(ANS.: A) COST PER UNIT: RS. 235.46; B) COST DRIVER RATE: 1,500, 190.53, 304.22, 189.96; TOTAL COST: RS. 32,37,146; COST PER UNIT OF OUTPUT: RS. 217.14) (SOLVE PROBLEM NO. 2 OF ASSIGNMENT PROBLEMS AS REWORK)

PROBLEM 3: ABC Ltd. is a multiproduct company, manufacturing three products A, B and C. The budgeted costs and production for the year ending 31st March, 20X8 are as follows:

| | A | B | C |
|-----------------------------|-------|-------|-------|
| Production quantity (Units) | 4,000 | 3,000 | 1,600 |
| Resources per Unit: | | | |
| - Direct Materials (Kg.) | 4 | 6 | 3 |
| - Direct Labour (Minutes) | 30 | 45 | 60 |

The budgeted direct labour rate was Rs10 per hour, and the budgeted material cost was 2 per kg. Production overheads were budgeted at Rs 99,450 and were absorbed to products using the direct labor hour rate. ABC Ltd. followed an Absorption Costing System.

ABC Ltd. is now considering to adopt an Activity Based Costing system. The following additional information is made available for this purpose.

1. Budgeted overheads were analyzed into the following:

| | Amount (Rs.) |
|-------------------|--------------|
| Material handling | 29,100 |
| Storage costs | 31,200 |
| Electricity | 39,150 |

2. The cost drivers identified were as follows:

| | |
|-------------------|-------------------------------|
| Material handling | Weight of material handled |
| Storage costs | Number of batches of material |
| Electricity | Number of Machine operations |

3. Data on Cost Drivers was as follows:

| Particulars | A | B | C |
|---|----|---|----|
| For complete production: Batches of material | 10 | 5 | 15 |
| Per unit of production: Number of Machine operators | 6 | 3 | 2 |

You are requested to:

- Prepare a statement for management showing the unit costs and total costs of each product using the absorption costing method.
- Prepare a statement for management showing the product costs of each product using the ABC approach.
- What are the reasons for the different product costs under the two approaches? (A) (NEW SM)

(ANS.: UNIT COSTS UNDER ABSORPTION COSTING: A-86,000, B-96,750, C-52,800; ABC COSTING: A-1,00,360, B- 86,940, C-48,256)

(SOLVE PROBLEM NO. 3 OF ASSIGNMENT PROBLEMS AS REWORK)

Note: _____

PROBLEM 4: MST Limited has collected the following data for its two activities. It calculates activity cost rates based on cost driver capacity.

| Activity | Cost Driver | Capacity | Cost |
|---------------------|-----------------------|-----------------------|--------------|
| Power | Kilowatt hours | 50,000 kilowatt hours | Rs.2,00,000 |
| Quality Inspections | Number of Inspections | 10,000 Inspections | Rs. 3,00,000 |

The company makes three products M, S and T. For the year ended March 31, 20X4, the following consumption of cost drivers was reported:

| Product | Kilowatt hours | Quality Inspections |
|---------|----------------|---------------------|
| M | 10,000 | 3,500 |
| S | 20,000 | 2,500 |
| T | 15,000 | 3,000 |

Required:

- i) Compute the costs allocated to each product from each activity.
- ii) Calculate the cost of unused capacity for each activity.
- iii) Discuss the factors the management considers in choosing a capacity level to compute the budgeted fixed overhead cost rate. (A) (NEW SM)

(ANS.: COST ALLOCATION: POWER-1, 80,000, QUALITY INSPECTIONS- 2, 70,000, COST OF UNUSED CAPACITY- 50,000)

(SOLVE PROBLEM NO. 4 OF ASSIGNMENT PROBLEMS AS REWORK)

Note: _____

PROBLEM 5: ABC Ltd. Manufactures two types of machinery equipment Y and Z and applies / absorbs overheads on the basis of direct - labour hours. The budgeted overheads and direct-labour hours for the month of December, 20X6 are Rs.12,42,500 and 20,000 hours respectively.

The information about Company's products is as follows:

| Particulars | Equipment Y | Equipment Z |
|--------------------------------|------------------|------------------|
| Budgeted Production volume | 2,500 units | 3,125 units |
| Direct material cost | Rs. 300 per unit | Rs. 450 per unit |
| Direct labour cost | | |
| Y : 3 hours @ Rs. 150 per hour | | |
| X : 4 hours @ Rs. 150 per hour | Rs. 450 | Rs. 600 |

ABC Ltd.'s overheads of Rs.12,42,500 can be identified with three major activities: Order Processing (Rs.2,10,000), machine processing (Rs.8,75,000) and product inspection (Rs.1,57,500). These activities are driven by number of orders processed, machine hours worked, and inspection hours, respectively. The data relevant to these activities is as follows:

| | Orders processed | Machine hours worked | Inspection Hours |
|--------------|------------------|----------------------|------------------|
| Y | 350 | 23,000 | 4,000 |
| Z | 250 | 27,000 | 11,000 |
| Total | 600 | 50,000 | 15,000 |

Required:

- i) Assuming use of direct-labour hours to absorb/apply overheads to production, compute the unit manufacturing cost of the equipment Y and Z, if the budgeted manufacturing volume is attained.
- ii) Assuming use of activity-based costing, compute the unit manufacturing costs of the equipment Y and Z, if the budgeted manufacturing volume is achieved.
- iii) ABC Ltd.'s selling prices are based heavily on cost. By using direct-labour hours as an application base, calculate the amount of cost distortion (under-costed or over costed) for each equipment.

(A) (NEW SM) (ANS.: DL HOURS Y-936.38, Z-1,298.50; TOTAL OH COST: Y-5, 67,000, Z-6, 75,500, COST DISTORTION: Y: (-40.42, Z-+32.34) (SOLVE PROBLEM NO. 5 OF ASSIGNMENT PROBLEMS AS REWORK)

Note: _____

PROBLEM 6: (PRINTED SOLUTION AVAILABLE) RST Limited specializes in the distribution of pharmaceutical products. It buys from the pharmaceutical companies and resells to each of the three different markets.

- i) General Supermarket Chains
- ii) Drugstore Chains
- iii) Chemist Shops

The following data for the month of April, 20X7 in respect of RST Limited has been reported:

| Particulars | General Supermarket Chains (Rs.) | Drugstore Chains (Rs.) | Chemist Shops (Rs.) |
|---|----------------------------------|------------------------|---------------------|
| Average revenue per delivery | 84,975 | 28,875 | 5,445 |
| Average cost of goods sold per delivery | 82,500 | 27,500 | 4,950 |
| Number of deliveries | 330 | 825 | 2,750 |

In the past, RST Limited has used gross margin percentage to evaluate the relative profitability of its distribution channels. The company plans to use activity -based costing for analysing the profitability of its distribution channels.

The Activity analysis of RST Limited is as under:

| Activity Area | Cost Driver |
|------------------------------------|--|
| Customer purchase order processing | Purchase orders by customers |
| Line-item ordering | Line-items per purchase order |
| Store delivery | Store deliveries |
| Cartons dispatched to stores | Cartons dispatched to a store per delivery |
| Shelf-stocking at customer store | Hours of shelf-stocking |

The April, 20X7 operating costs (other than cost of goods sold) of RST Limited are Rs. 8,27,970. These operating costs are assigned to five activity areas. The cost in each area and the quantity of the cost allocation basis used in that area for April, 20X7 are as follows:

| Activity Area | Total costs in April, 20X7 (Rs.) | Total Units of Cost Allocation Base used in April, 20X7 |
|------------------------------------|----------------------------------|---|
| Customer purchase order processing | 2,20,000 | 5,500 orders |
| Line-item ordering | 1,75,560 | 58,520 line items |
| Store delivery | 1,95,250 | 3,905 store deliveries |
| Cartons dispatched to store | 2,09,000 | 2,09,000 cartons |
| Shelf-stocking at customer store | 28,160 | 1,760 hours |

Other data for April, 20X7 include the following:

| Particulars | General Supermarket Chains | Drugstore Chains | Chemist Shops |
|--|----------------------------|------------------|---------------|
| Total number of orders | 385 | 990 | 4,125 |
| Average number of line items per order | 14 | 12 | 10 |
| Total number of store deliveries | 330 | 825 | 2,750 |
| Average number of cartons shipped per store delivery | 300 | 80 | 16 |
| Average number of hours of shelf stocking per store delivery | 3 | 0.6 | 0.1 |

Required:

- Compute for April, 20X7 gross-margin percentage for each of its three distribution channels and compute RST Limited's operating income.
- Compute the April, 20X7 rate per unit of the cost-allocation base for each of the five activity areas.
- Compute the operating income of each distribution channel in April, 20X7 using the activity-based costing information. Comment on the results. What new insights are available with the activity-based cost information?
- Describe four challenges one would face in assigning the total April, 20X7 operating costs of Rs.8,27,970 to five activity areas.

(A) (NEW SM - TYK)

(ANS.: I) 2.91%, 4.76%, 9.09%, 3.72; II) 40 ORDERS, 3 LINE ITEM ORDER, 50 DELIVERY, 1 DISPATCH, 16 HOURS)

PROBLEM 7: (PRINTED SOLUTION AVAILABLE) Alpha Limited has decided to analyse the profitability of its five new customers. It buys bottled water at Rs. 90 per case and sells to retail customers at a list price of Rs. 108 per case. The data pertaining to five customers are:

| Particulars | Customers | | | | |
|-----------------------------------|-----------|-----------|----------|-----------|----------|
| | A | B | C | D | E |
| Cases sold | 4,680 | 19,688 | 1,36,800 | 71,550 | 8,775 |
| List Selling Price | Rs.108 | Rs.108 | Rs.108 | Rs.108 | Rs.108 |
| Actual Selling Price | Rs.108 | Rs.106.20 | Rs.99 | Rs.104.40 | Rs.97.20 |
| Number of Purchase orders | 15 | 25 | 30 | 25 | 30 |
| Number of Customer visits | 2 | 3 | 6 | 2 | 3 |
| Number of deliveries | 10 | 30 | 60 | 40 | 20 |
| Kilometers travelled per delivery | 20 | 6 | 5 | 10 | 30 |
| Number of expedited deliveries | 0 | 0 | 0 | 0 | 1 |

Its five activities and their cost drivers are:

| Activity | Cost Driver Rate |
|----------------------|-----------------------------------|
| Order taking | Rs.750 per purchase order |
| Customer visits | Rs.600 per customer visit |
| Deliveries | Rs.5.75 per delivery Km travelled |
| Product handling | Rs.3.75 per case sold |
| Expedited deliveries | Rs.2,250 per expedited delivery |

Required:

- Compute the customer-level operating income of each of five retail customers now being examined (A, B, C, D and E). Comment on the results.
- What insights are gained by reporting both the list selling price and the actual selling price for each customer
(A) (NEW SM - TYK)

(ANS.: I) 53,090; 2,23,531; 6,90,375; 7,39,757; 274; II) THE REASONS FOR 10.80 DISCOUNT PER CASE FOR CUSTOMER E SHOULD BE EXPLORED) (SOLVE PROBLEM NO. 6 OF ASSIGNMENT PROBLEMS AS REWORK)

Note: _____

ASSIGNMENT PROBLEMS

PROBLEM 1: PQR Pens Ltd. manufactures two products - 'Gel Pen' and 'Ball Pen'. It furnishes the following data for the year 2017:

| Product | Annual Output (Units) | Total Machine Hours | Total number of Purchase orders | Total number of set-ups |
|----------|-----------------------|---------------------|---------------------------------|-------------------------|
| Gel Pen | 5,500 | 24,000 | 240 | 30 |
| Ball Pen | 24,000 | 54,000 | 448 | 56 |

The annual overheads are as under:

| Particulars | Amount (Rs.) |
|-------------------------------|--------------|
| Volume related activity costs | 4,75,020 |
| Set up related costs | 5,79,988 |
| Purchase related costs | 5,04,992 |

Calculate the overhead cost per unit of each Product - Gel Pen and Ball Pen on the basis of:

- Traditional method of charging overheads
- Activity based costing method and
- Find out the difference in cost per unit between both the methods.
(A) (M18 (N) - 10M)

(ANS.: I) OH RATE (P.U.): RS. 87.27, RS. 45; II) OH RATE (P.U.): RS. 95.39; RS. 43.13; III) DIFFERENCE: RS. (8.12), RS. 1.87)

PROBLEM 2: G-2020 Ltd. is a manufacturer of a range of goods. The cost structure of its different products is as follows:

| Particulars | Product A | Product B | Product C | Unit of measurement |
|------------------------------|-----------|-----------|-----------|---------------------|
| Direct Materials | 50 | 40 | 40 | Rs./u |
| Direct Labour @ Rs. 10/ hour | 30 | 40 | 50 | Rs./u |
| Production Overheads | 30 | 40 | 50 | Rs./u |
| Total Cost | 110 | 120 | 140 | Rs./u |
| Quantity Produced | 10,000 | 20,000 | 30,000 | Units |

G-2020 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:

| Activity Cost Pool | Cost Driver | Associated Cost (Rs.) |
|--------------------|---------------------------|-----------------------|
| 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 |

Required: Calculate activity based production cost of all the three products.

(B) (RTP M18 (N)) (ANS.: PRODUCT A: RS. 150.49; PRODUCT B: 124.25; PRODUCT C: RS. 123.67)

PROBLEM 3: MNP Suits is a ready to wear Suit Manufacturer. It has four customers: two wholesale-channel customers and two retail channel customers. MNP suits has developed the following Activity Based costing system.

| Activity | Cost Driver | ABC Rate(Rs.) |
|------------------|------------------------------|--------------------|
| Order Processing | Number of Purchase Orders | 1,225 per order |
| Sales Visits | Number of Customer Visits | 7,150 per visit |
| Delivery-regular | Number of Regular Deliveries | 1,500 per delivery |
| Delivery-rushed | Number of Rushed Deliveries | 4,250 per delivery |

List Selling Price per Suit is 1,000 and Average Cost per Suit is 550. The CEO of MNP Suits wants to evaluate the profitability of each of the four customers in the last year, to explore opportunities for increasing profitability of his Company in the next year. The following data are available for the next year.

| Particulars | Wholesale Customers | | Retail Customers | |
|-----------------------------------|---------------------|---------|------------------|--------|
| | W | H | R | T |
| Total Number of Orders | 44 | 62 | 212 | 250 |
| Total Number of Sales Visits | 8 | 12 | 22 | 20 |
| Regular Deliveries | 41 | 48 | 166 | 190 |
| Rush Deliveries | 3 | 14 | 46 | 60 |
| Average Number of Suits per order | 400 | 200 | 30 | 25 |
| Average Selling Price per Suit | Rs.700 | Rs. 800 | Rs.850 | Rs.900 |

Required:

- Calculate the customer - level Operating Income in the last year.
- What do you recommend to CEO of MNP Suits to do, to increase the Company's Operating Income in the next year?
- Assume MNP Suits' Distribution Channel Costs are Rs. 17,50,000 for its Wholesale Customers and Rs. 10,50,000 for the Retail Customers. Also, assume that its Corporate Sustaining Costs are Rs. 12,50,000. Prepare Income Statement of MNP Suits.

(A) (ANS.: 1) 24,54,650, 28,06,750, 10,46,500, 11,98,250; 3) OPERATING INCOME: 34,56,150)

PROBLEM 4: CDE Ltd. is following Activity based costing. Budgeted overheads, cost drivers and volume are as follows:

| Cost pool | Budgeted overheads (Rs.) | Cost driver | Budgeted volume |
|----------------------|--------------------------|-------------------|-----------------|
| Material procurement | 18,42,000 | No. of orders | 1,200 |
| Material handling | 8,50,000 | No. of movement | 1,240 |
| Maintenance | 24,56,000 | Maintenance hours | 17,550 |
| Set-up | 9,12,000 | No. of set-ups | 1,450 |
| Quality control | 4,42,000 | No. of inspection | 1,820 |

The company has produced a batch of 7,600 units, its material cost was Rs.24,62,000 and wages Rs.4,68,500. Usage activities of the said batch are as follows:

Material orders 56

Material movements 84

Maintenance hours 1,420 hours

Set-ups 60

No. of inspections 18

Required:

- Calculate cost driver rates.
- Calculate the total and unit cost for the batch.

(B) (PQ)

(ANS.: I) COST DRIVER RATE: 1,535; 685.48; 139.94; 628.97; 242.86; II) TOTAL COST: RS. 33,14,864.80; UNIT COST: RS. 436.17)

PROBLEM 5: Bank of Surat operated for years under the assumption that profitability can be increased by increasing Rupee volume. But that has not been the case. Cost analysis has revealed the following:

| Activity | Activity Cost (Rs.) | Activity Driver | Activity Capacity |
|-----------------------|---------------------|---------------------|-------------------|
| Providing ATM Service | 1,00,000 | No. of Transactions | 2,00,000 |
| Computer Processing | 10,00,000 | No. of Transactions | 25,00,000 |
| 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:

| Activity Driver | 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:

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

(C) (MTP1 M18 (N) - 5M) (ANS.: I) 0.50, 0.40, 1.60, 0.60; II) 52.67; 42.80; 46.60)

PROBLEM 6: MST Limited has collected the following data for its two activities. It calculates activity cost rates based on cost driver capacity.

| Activity | Cost Driver | Capacity | Cost (Rs.) |
|---------------------|-----------------------|-----------------------|------------|
| Power | Kilowatt hours | 50,000 kilowatt hours | 40,00,000 |
| Quality Inspections | Number of Inspections | 10,000 Inspections | 60,00,000 |

The company makes three products M, S and T. For the year ended March 31, 20X9, the following consumption of cost drivers was reported:

| Product | Kilowatt hours | Quality Inspections |
|---------|----------------|---------------------|
| M | 10,000 | 3,500 |
| S | 20,000 | 2,500 |
| T | 15,000 | 3,000 |

Required:

- PREPARE a statement showing cost allocation to each product from each activity.
- CALCULATE the cost of unused capacity for each activity.
- STATE the factors the management considers in choosing a capacity level to compute the budgeted fixed overhead cost rate.

(B) (RTP M19 (N)) (ANS.: A) POWER: M: RS. 8,00,000; S: RS. 16,00,000; T: RS. 12,00,000; QUALITY INSPECTIONS: M: RS. 21,00,000; S: RS. 15,00,000, T: RS. 18,00,000; B) RS. 10,00,000

PRINTED SOLUTIONS FOR SELECTIVE PROBLEMS

PROBLEM NUMBERS TO WHICH SOLUTIONS ARE PROVIDED: 6, 7

PROBLEM NO. 6

- i) RST Limited's

Statement of operating income and gross margin percentage for each of its three distribution channels

| Particulars | General Super Market Chains | Drugstore Chains | Chemist Shops | Total |
|------------------------------------|-----------------------------------|-----------------------------------|------------------------------------|-------------|
| Revenues: (Rs.) | 2,80,41,750 (330 × Rs. 84,975) | 2,38,21,875 (825 × Rs. 28,875) | 1,49,73,750 (2,750 × Rs. 5,445) | 6,68,37,375 |
| Less: Cost of goods sold: (Rs.) | 2,72,25,000 (330 × Rs. 82,500) | 2,26,87,500 (825 × Rs. 27,500) | 1,36,12,500 (2,750 × Rs. 4,950) | 6,35,25,000 |
| Gross Margin: (Rs.) | 8,16,750 | 11,34,375 | 13,61,250 | 33,12,375 |
| Less: Other operating costs: (Rs.) | | | | 8,27,970 |
| Operating income: (Rs.) | | | | 24,84,405 |
| Gross Margin | 2.91% | 4.76% | 9.09% | 4.96% |
| Operating income (%) | | | | 3.72 |

- ii) **Computation of rate per unit of the cost allocation base for each of the five activity areas for April 20X7**

| Particulars | Amount (Rs.) |
|--|-------------------|
| Customer purchase order processing (Rs. 2,20,000/ 5,500 orders) | 40 order |
| Line item ordering (Rs. 1,75,560/ 58,520 line items) | 3 line item order |
| Store delivery (Rs. 1,95,250/ 3,905 store deliveries) | 50 delivery |
| Cartons dispatched (Rs. 2,09,000/ 2,09,000 dispatches) | 1 dispatch |
| Shelf-stocking at customer store (Rs.) (Rs. 28,160/ 1,760 hours) | 16 hour |

- iii) **Operating Income Statement of each distribution channel in April-20X7 (Using the Activity based Costing information)**

| Particulars | General Super Market Chains | Drugstore Chains | Chemist Shops |
|--|-----------------------------|------------------|---------------|
| Gross margin (Rs.) : (A) (Refer to (i) part of the answer) | 8,16,750 | 11,34,375 | 13,61,260 |
| Operating cost (Rs.) : (B) (Refer to working note) | 1,62,910 | 1,90,410 | 4,74,650 |
| Operating income (Rs.) : (A - B) | 6,53,840 | 9,43,965 | 8,86,600 |
| Operating income (in %) (Operating income/ Revenue) × 100 | 2.33 | 3.96 | 5.96 |

Comments and new insights: The activity-based cost information highlights, how the 'Chemist Shops' uses a larger amount of RST Ltd.'s resources per revenue than do the other two distribution channels. Ratio of operating costs to revenues, across these markets is:

| | |
|---|-------|
| General supermarket chains (Rs. 1,62,910/ Rs.. 2,80,00,750) × 100 | 0.58% |
| Drug store chains (Rs. 1,90,410/ Rs. 2,38,21,875) × 100 | 0.80% |
| Chemist shops (Rs. 4,74,650/ Rs. 1,49,73,750) × 100 | 3.17% |

Working note: Computation of operating cost of each distribution channel:

| | General Super Market Chains (Rs.) | Drugstore Chains (Rs.) | Chemist Shops (Rs.) |
|------------------------------------|---|--|--|
| Customer purchase order processing | 15,400 (Rs. 40 × 385 orders) | 39,600 (Rs. 40 × 990 orders) | 1,65,000 (Rs. 40 × 4125 orders) |
| Line item ordering | 16,170 (Rs. 3 × 14 × 385) | 35,640 (Rs. 3 × 12 × 990) | 1,23,750 (Rs. 3 × 10 × 4125) |
| Store delivery | 16,500 (Rs. 50 × 330 deliveries) | 41,250 (Rs. 50 × 825 deliveries) | 1,37,500 (Rs. 50 × 2750 deliveries) |
| Cartons dispatched | 99,000 (Rs. 1 × 300 cartons × 300 deliveries) | 66,000 (Rs. 1 × 80 cartons × 825 deliveries) | 44,000 (Rs. 1 × 16 cartons × 2,750 deliveries) |
| Shelf stocking | 15,840 (Rs. 16 × 330 deliveries × 3 Av. hrs.) | 7,920 (Rs. 16 × 825 deliveries × 0.6 Av. hrs.) | 4,400 (Rs. 16 × 2,750 deliveries × 0.1 Av. hrs.) |
| Operating cost | 1,62,910 | 1,90,410 | 4,74,650 |

iv) Challenges faced in assigning total operating cost of Rs. 8,27,970 :

- Choosing an appropriate cost driver for activity area.
- Developing a reliable data base for the chosen cost driver.
- Deciding, how to handle costs that may be common across several activities.
- Choice of the time period to compute cost rates per cost driver.
- Behavioural factors.

PROBLEM NO. 7

Working note: Computation of revenues (at listed price), discount, cost of goods sold and customer level operating activities costs:

| Particulars | Customers | | | | |
|--|-----------|----------------------------------|------------------------------------|------------------------------------|----------------------------------|
| | A | B | C | D | E |
| Cases sold: (a) | 4,680 | 19,688 | 1,36,800 | 71,550 | 8,775 |
| Revenues (at listed price) (Rs.): (b) {(a) × Rs. 108} | 5,05,440 | 21,26,304 | 1,47,74,400 | 77,27,400 | 9,47,700 |
| Discount (Rs.): (c) {(a) × Discount per case} | - | 35,438 (19,688 cases × Rs. 1.80) | 12,31,200 (1,36,800 cases × Rs. 9) | 2,57,580 (71,550 cases × Rs. 3.60) | 94,770 (8,775 cases × Rs. 10.80) |
| Cost of goods sold (Rs.): (d) {(a) × Rs. 90} | 4,21,200 | 17,71,920 | 1,23,12,000 | 64,39,500 | 7,89,750 |
| Customer level operating activities costs: | | | | | |
| Order taking costs (Rs.): (No. of purchase × Rs.750) | 11,250 | 18,750 | 22,500 | 18,750 | 22,500 |
| Customer visits costs (Rs.) (No. of customer visits × Rs. 600) | 1,200 | 1,800 | 3,600 | 1,200 | 1,800 |
| Delivery vehicles travel costs (Rs.) (Rs. 5.75 per km) (Kms travelled by delivery vehicles × Rs. 5.75 per km.) | 1,150 | 1,035 | 1,725 | 2,300 | 3,450 |
| Product handling costs (Rs.) {(a) × Rs. 3.75} | 17,550 | 73,830 | 5,13,000 | 2,68,313 | 32,906 |
| Cost of expediting deliveries (Rs.) {No. of expedited deliveries × Rs. 2,250} | - | - | - | - | 2,250 |
| Total cost of customer level operating activities (Rs.) | 31,150 | 95,415 | 5,40,825 | 2,90,563 | 62,906 |

i) Computation of Customer level operating income

| Particulars | Customers | | | | |
|--|-----------|-----------|-------------|-----------|----------|
| | A (Rs.) | B (Rs.) | C (Rs.) | D (Rs.) | E (Rs.) |
| Revenues (At list price) (Refer to working note) | 5,05,440 | 21,26,304 | 1,47,74,400 | 77,27,400 | 9,47,700 |
| Less: Discount (Refer to working note) | - | 35,438 | 12,31,200 | 2,57,580 | 94,770 |
| Revenue (At actual price) | 5,05,440 | 20,90,866 | 1,35,43,200 | 74,69,820 | 8,52,930 |
| Less: Cost of goods sold (Refer to working note) | 4,21,200 | 17,71,920 | 1,23,12,000 | 64,39,500 | 7,89,750 |
| Gross margin | 84,240 | 3,18,946 | 12,31,200 | 10,30,320 | 63,180 |
| Less: Customer level operating activities costs (Refer to working note) | 31,150 | 95,415 | 5,40,825 | 2,90,563 | 62,906 |
| Customer level operating income | 53,090 | 2,23,531 | 6,90,375 | 7,39,757 | 274 |

Comment on the results:

Customer D is the most profitable customer, despite having only 52.30% of the unit volume of customer C. The main reason is that C receives a Rs. 9 per case discount while customer D receives only a Rs. 3.60 discount per case.

Customer E is less profitable, in comparison with the small customer A being profitable. Customer E received a discount of Rs. 10.80 per case, makes more frequent orders, requires more customer visits and requires more delivery kms. in comparison with customer A.

ii) **Insight gained by reporting both the list selling price and the actual selling price for each customer:**

Separate reporting of both-the listed and actual selling prices enables Alpha Ltd. To examine which customer has received what discount per case, whether the discount received has any relationship with the sales volume. The data given below provides us with the following information;

| Sales volume | Discount per case (Rs.) |
|--------------------|-------------------------|
| C (1,36,800 cases) | 9.00 |
| D (71,550 cases) | 3.60 |
| B (19,688 cases) | 1.80 |
| E (8,775 cases) | 10.80 |
| A (4,680 cases) | 0 |

The above data clearly shows that the discount given to customers per case has a direct relationship with sales volume, except in the case of customer E. The reasons for 10.80 discount per case for customer E should be explored.

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To **MASTER MINDS**, Guntur

THE END