**MAIN MATERIAL / CA INTER / GR. 1 / BOOK 48 / COSTING – PART 8 / 42.5E**

CHAPTERS INCLUDED – ACTIVITY BASED COSTING

(APPLICABLE TO MAY2020 ATTEMPT OF CA INTER. SYNCHRONISED WITH JULY 2019 EDITION OF ICAI SM. ISSUED ON 05/12/19)

# 5. ACTIVITY BASED COSTING

NO. OF PROBLEMS IN 41.5E OF CA INTER: CLASSROOM - 5, ASSIGNMENT – 6

NO. OF PROBLEMS IN 42E OF CA INTER: CLASSROOM - 7, ASSIGNMENT – 8

NO. OF PROBLEMS IN 42.5E OF CA INTER: CLASSROOM - 6, ASSIGNMENT - 7

## 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 | ILL 1 | - | - | - | - | - | - | |
| CR 3 | PQ 1 | - | - | - | - | - | - | |
| CR 4 | - | - | - | - | - | - | N19 | |
| CR 5 | - | - | - | - | | M19(NEW) | - | |
| CR 6 | - | - | - | - | N19 | - | - | |
| AS 1 | - | - | - | | - | - | M18 (N) - 10M | |
| AS 2 | - | - | - | - | M18 (N) | - | - | |
| AS 3 | - | - | - | - | - | N 19(N) | - | |
| AS 4 | PQ 2 | - | | - | - | - | - | |
| AS 5 | - | - | | - | | M18 (N) - 5M | - | |
| AS 6 | - | - | - | - | - | - | M19 (N)-10M | |
| AS 7 | - | - | - | - | - | - | - | |



**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:**

a) Identification of activities and their respective costs

b) Identification of cost driver of each activity and computation of an allocation Rate per activity

c) Allocation of overhead cost to products/ services based on the activities involved

**MEANING OF TERMS USED IN ABC**

i) Activity - Activity, here, refers to an event that incurs cost.

ii) A Cost Object-It is an item for which cost measurement is required e.g. a product or a customer.

iii) 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.

iv) **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 | • Number of research projects<br>• Personnel hours on a project |
| Design of products, services and procedures | • Number of products in design<br>• Number of parts per product<br>• Number of engineering hours |
| Customer Service | • Number of service calls<br>• Number of products serviced<br>• Hours spent on servicing products |
| Marketing | • Number of advertisements<br>• Number of sales personnel<br>• Sales revenue |
| Distribution | • Number of units distributed<br>• 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 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.
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.

$$\text{Activity cost driver rate} = \frac{\text{Total cost of activity}}{\text{Activity driver}} \left[ \frac{\text{cost Pool}}{\text{volume of cost driver}} \right]$$

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**

# 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)***

**Concept question:** what is the impact on the question, if if production of products A, B, and C are 5000 units,8,000 units, and 10,000 units respectively.

**Note:**_____

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**PROBLEM 2:** 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:**

1. Prepare a statement for management showing the unit costs and total costs of each product using the absorption costing method.
2. Prepare a statement for management showing the product costs of each product using the ABC approach.
3. 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. 2 OF ASSIGNMENT PROBLEMS AS REWORK)***

**Concept question:** what is the impact on the question, if production of product A,B&C are 1000,5000&2000 units respectively.

**Note:**_____

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**PROBLEM 3:** 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:**

**i)** Compute for April, 20X7 gross-margin percentage for each of its three distribution channels and compute RST Limited's operating income.

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

**iii)** 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?

**iv)** 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)***

***(SOLVE PROBLEM NO. 3 OFASSIGNMENT PROBLEMS AS REWORK)***



**Concept question:** what is the impact on the question, if if average revenue per delivery are Rs.80,000 40,000 & 20,000 for the three markets.

**Note:**_____

**PROBLEM 4:** PQR Ltd has decided to analyze the profitability of it's five new customers. It buys soft drink bottles in cases at 45 per case and sells them to retail customers at a list price of 54 per case. The data pertaining to five customers are given below: 10

| Particulars | Customers | | | | |
|---|---|---|---|---|---|
| | A | B | C | D | E |
| Number of Cases Sold | 9360 | 14200 | 62000 | 38000 | 9800 |
| List Selling Price | 54 | 54 | 54 | 54 | 54 |
| Actual Selling Price | 54 | 53.4 | 49 | 50.2 | 48.60 |
| Number of Purchase Orders | 30 | 50 | 60 | 50 | 60 |
| Number of Customers visits | 4 | 6 | 12 | 4 | 6 |
| Number of Deliveries | 20 | 60 | 120 | 80 | 40 |
| Kilometers travelled per delivery | 40 | 12 | 10 | 20 | 60 |
| Number of expediate Deliveries | 0 | 0 | 0 | 0 | 2 |

**It's five activities and their cost drivers are :**

| Activity | Cost Driver |
|---|---|
| Order taking | 200 per purchase order |
| Customer visits | 300 per each visit |
| Deliveries | 4.00 per delivery km travelled |
| Product Handling | 2.00 per case sold |
| Expedited deliveries | 100 per each such delivery |

**You are required to:**

(i) Compute the customer level operating income of each of five retail customers by using the Cost Driver rates.

(ii) Examine the results to give your comments on Customer 'D' in comparison with Customer 'C' and on Customer 'E' in comparison with Customer 'A'. **(NOV 19 10M)**

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

**Concept question:** what is the impact on the question if actual selling price for customer is Rs.30.

**Note:**_____

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**PROBLEM 5: (PRINTED SOLUTION AVAILABLE)** Humara - Apna' 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:

| Activity | Present Cost (Rs.) | Estimation for the budget period: |
|---|---|---|
| ATM Services:<br>(a) Machine Maintenance<br>(b) Rents<br>(c) Currency Replenishment Cost | 4,00,000<br>2,00,000<br>1,00,000 | All fixed, no change.<br>Fully fixed, no change<br>Expected to double during budget period<br>(This activity is driven by no. of ATM transactions) |
| Computer Processing | 5,00,000 | Half this amount is fixed and no change is expected.<br>The variable portion is expected to increase to three times the current level.<br>(This activity is driven by the number of computer transactions) |
| Issuing Statements | 18,00,000 | Presently, 3 lakh statements are made. In the budget period, 5 lakh statements are expected.<br>For every increase of one lakh statement, one lakh rupees is the budgeted increase.<br>(This activity is driven by the number of statements) |
| Computer Inquiries | 2,00,000 | Estimated to increase by 80% during the budget period. (This activity is driven by telephone minutes) |

The activity drivers and their budgeted quantifies are given below:

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

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

**Required**

(i) CALCULATE the budgeted rate for each activity.

(ii) PREPARE the budgeted cost statement activity wise.

(iii) COMPUTE the budgeted product cost per account for each product using (i) and (ii) above.

(MTP M19)(ANS:I) 50 30 60 )

*(SOLVE PROBLEM NO. 5 OF ASSIGNMENT PROBLEMS AS REWORK)*

**Concept question:** what is the impact on the question if present issuing statement cost is Rs.20,00,000.

**Note:**_____

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**PROBLEM 6: (PRINTED SOLUTION AVAILABLE)** SMP Pvt. Ltd. manufactures three products using three different machines. At Present the overheads are charged to products using labour hours. The following statement for the month of September 2019, using the absorption costing method has been prepared:



| Particulars | Product X (using machine A) | Product Y (using machine B) | Product Z (using machine C) |
|---|---|---|---|
| Production units | 45,000 | 52,500 | 30,000 |
| Material cost per unit (Rs.) | 350 | 460 | 410 |
| Wages per unit @ Rs.80 per hour | 240 | 400 | 560 |
| Overhead cost per unit (Rs.) | 300 | 500 | 700 |
| Total cost per unit (Rs.) | 890 | ,1360 | 1,670 |
| Selling price (Rs.) | 1,112.50 | 1,700 | 2,087.50 |

The following additional information is available relating to overhead cost drivers.

| Cost driver | Product X | Product Y | Product Z | Total |
|---|---|---|---|---|
| No. of machine set-ups | 40 | 160 | 400 | 600 |
| No. of purchase orders | 400 | 800 | 1200 | 2400 |
| No. of customers | 1000 | 2200 | 4800 | 8000 |

Actual production and budgeted production for the month is same. Workers are paid at standard rate. Out of total overhead costs, 30% related to machine set-ups, 30% related to customer order processing and customer complaint management, while the balance proportion related to material ordering.

**Required:**

(i) COMPUTE overhead cost per unit using activity based costing method.

(ii) DETERMINE the selling price of each product based on activity-based costing with the same profit mark-up on cost. (RTP NOV 19) (i). X=129.60Y= 268.46 Z=955.80 ii) X=899.50 Y=1,410.57 2, Z=407.2)

*(SOLVE PROBLEM NO. 6,7,8OF ASSIGNMENT PROBLEMS AS REWORK)*

**Concept question:** what is the impact on the question if material cost per unit is 400,500,550 respectively for product XYZ.

**Note:**_____

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# PRINTED SOLUTIONS FOR SELECTIVE PROBLEMS

**PROBLEM NUMBERS TO WHICH SOLUTIONS ARE PROVIDED: 5,6**

## PROBLEM NO. 5

Statement Showing "Budgeted Cost per unit of the Product"

| Activity | Activity Cost (Budgete d) (Rs.) | Activity Driver | No. of Units of Activity Driver (Budget) | Activity Rate (Rs.) | Deposits | Loans | Credit Cards |
|---|---|---|---|---|---|---|---|
| ATM Services | 8,00,000 | No. of ATM Transaction | 2,00,000 | 4.00 | 6,00,000 | - | 2,00,000 |
| Computer Processing | 10,00,000 | No. of Computer Transaction | 20,00,000 | 0.50 | 7,50,000 | 1,00,000 | 1,50,000 |
| Issuing Statements | 20,00,000 | No. of Statements | 5,00,000 | 4.00 | 14,00,000 | 2,00,000 | 4,00,000 |
| 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 Note:**

| Activity | Budgeted Cost (Rs.) | Remark |
|---|---|---|
| ATM Services: | | |
| (a) Machine Maintenance | 4,00,000 | − All fixed, no change. |
| (b) Rents | 2,00,000 | − Fully fixed, no change. |
| (c) Currency Replenishment Cost | 2,00,000 | |
| Total | 8,00,000 | − Doubled during budget period |
| Computer Processing | 2,50,000 | − Rs.2,50,000 (half of Rs.5,00,000) |
| | 7,50,000 | is fixed and no change is expected. |
| | | − Rs.2,50,000 (variable portion) is |
| | 10,00,000 | expected to increase to three times the current level |
| Issuing Statements | 18,00,000 | − Existing. |
| | 2,00,000 | − 2 lakh statements are expected to be increased in budgeted period. For every increase of one lakh |
| | 20,00,000 | statement, one lakh rupees is the budgeted increase. |
| Computer Inquiries | 3,60,000 | − Estimated to increase by 80% during the budget period. (Rs.2,00,000 x 180%) |

## PROBLEM NO. 6

**Workings:**

Total labor hours and overhead cost:

| Particulars | Product X | Product Y | Product Z | Total |
|---|---|---|---|---|
| Production units | 45,000 | 52,500 | 30,000 | 1,27,500 |
| Hour per unit | 3 | 5 | 7 | |
| Total hours | 1,35,000 | 2,62,500 | 2,10,000 | 6,07,500 |
| Rate per hour | | | | 80.00 |
| Total overhead | | | | 4,86,00,000 |

Cost per activity and driver

| Activity | Machine Set-up | Customer order processing | Customer complaint management | Total |
|---|---|---|---|---|
| Total overhead (Rs.) | 1,45,80,000 | 1,45,80,000 | 1,94,40,000 | 4,86,00,000 |
| No. of drivers | 600 | 2,400 | 8,000 | |
| Cost per driver (Rs.) | 24,300 | 6,075 | 2,430 | |

(i) Computation of Overhead cost per unit:

| Particulars | Product X | Product Y | Product Z |
|---|---|---|---|
| No. of machine set-ups | 40 | 160 | 400 |
| Cost per driver (Rs.) | 24,300 | 24,300 | 24,300 |
| Total Machine set-up cost (Rs.) [A] | 9,72,000 | 38,88,000 | 97,20,000 |
| No. of purchase orders | 400 | 800 | 1,200 |
| Cost per driver (Rs.) | 6,075 | 6,075 | 6,075 |
| Total order processing cost (Rs.) [B] | 24,30,000 | 48,60,000 | 72,90,000 |
| No. of customers | 1,000 | 2,200 | 4,800 |
| Cost per driver (Rs.) | 2,430 | 2,430 | 2,430 |
| management cost (Rs.) [C] | 24,30,000 | 53,46,000 | 1,16,64,000 |
| Total Overhead cost (Rs.) [A+B+C] | 58,32,000 | 1,40,94,000 | 2,86,74,000 |
| Production units | 45,000 | 52,500 | 30,000 |
| Cost per unit (Rs.) | 129.60 | 268.46 | 955.80 |



ii) Determination of Selling price per unit

| Particulars | Product X (using machine A) | Product Y (using machine B) | Product Z (using machine C) |
|---|---|---|---|
| Material cost per unit (Rs.) | 350.00 | 460.00 | 410.00 |
| Wages per unit @ Rs.80 per hour | 240.00 | 400.00 | 560.00 |
| Overhead cost per unit (Rs.) | 129.60 | 268.46 | 955.80 |
| Total cost per unit (Rs.) | 719.60 | 1,128.46 | 1,925.80 |
| Profit (25% profit mark-up) (Rs.) | 179.90 | 282.11 | 481.45 |
| Selling price (Rs.) | 899.50 | 1410.57 | 2407.25 |

# 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:

i) Traditional method of charging overheads

ii) Activity based costing method and

iii) 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:** 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:**

i) Calculate cost driver rates.

ii) 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 3:** Asian Mfg. Co. has 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 2018 for each product line:

| Particulars | Lemon | Grapes | Papaya |
|---|---|---|---|
| Revenues (Rs.) | 79,350 | 2,10,060 | 1,20,990 |
| Cost of goods sold (Rs.) | 60,000 | 1,50,000 | 90,000 |
| Cost of bottles returned (Rs.) | 1,200 | 0 | 0 |
| Number of purchase orders placed | 36 | 84 | 36 |
| Number of deliveries received | 30 | 219 | 66 |
| Hours of shelf stocking time | 54 | 540 | 270 |
| Items sold | 12,600 | 1,10,400 | 30,600 |

Asian Mfg. Co. also provides the following information for the year 2018:

| Activity | Description of Activity | Total Costs (Rs.) | Cost Allocation Basis |
|---|---|---|---|
| Bottle returns | Returning of empty bottles to the store | 1,200 | Direct tracing to product line |
| Ordering | Placing of orders of purchases | 15,600 | 156 purchase orders |
| Delivery | Physical delivery and the receipts of merchandise | 25,200 | 315 deliveries |
| Self- stocking | Stocking of merchandise on store shelves and ongoing restocking | 17,280 | 864 hours of time |
| Customer support | Assistance provided to customers including bagging and checkout | 30,720 | 1,53,600 items sold |



**Required:**

(i) Asian Mfg. Co. 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 Asian Mfg. Co. 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) SHOW a comparison statement. *(MTP N19)(ANS:i)20,400,4.97%,ii)20,400,4.97% iii)4.97%)*

**PROBLEM 4:** 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:**

i) 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.

ii) 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)***

**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:**

i) Calculate rates for each activity.

ii) 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:** ABC Ltd. Manufactures two types of machinery equipment Y and Z and applies / absorbs overheads on the basis of direct - labor hours. The budgeted overheads and direct-labor 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 labor 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)*

**PROBLEM 7:**MNO Ltd manufactures two types of equipment A and B and absorbs overheads on the basis of direct labour hours the budgeted overheads and direct labour hours for the month of march 2019 are Rs 15,00,000 and 25,000 hours respectively. The information about the company's product is as follows

| Particulars | Equipment | |
|---|---|---|
| | A | B |
| Budgeted Production volume | 3200 units | 3850 units |
| Direct Material cost | Rs 350 per unit | Rs 400 per unit |
| Direct Labour cost | | |
| A : 3hours @ Rs 120 per hour | Rs 360 | |
| B: 4hours @ 120 per hour | | Rs 480 |



Overheads of Rs 15,00,000 can be identified with the fallowing three major activities

Order processing: Rs3,00,000

Machine Processing: Rs10,00,000

Product inspection: 2,00,000

These activities are driven by the number of orders processed, machine hours worked and inspection hours respectively.

The data relevant to these activities is as fallows

| | Orders processed | Machine hours worked | Inspection hours |
|---|---|---|---|
| A | 400 | 22,500 | 5,000 |
| B | 200 | 27,500 | 15,000 |
| **Total** | **600** | **50,000** | **20,000** |

**Required:**

a) Prepare a statement showing the manufacturing cost per unit so each product using the absorption costing method assuming the budgeted manufacturing volume is attained

b) Determine cost driver rates and prepare a statement showing the manufacturing volume is attained

c) MNO Ltd.'s selling prices are based heavily on cost by using direct labour hour as an application base calculate the amount of cost of distortion (undercosted or overcosted ) for each equipment.

*(MAY 19 NEW 10M)(ANS:I)A 190,B=1120 II) 500 RS/ORDER, 20/MACHINE HOUR, 10/ INSPECTION HOUR III)A= (101.75),B= 32.2)*

**PROBLEM 8:** 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)*

## ADDITIONAL QUESTION BANK FOR STUDENTS SELF PRACTICE

**PROBLEM 1:** 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:**

1. Calculate the customer - level Operating Income in the last year.
2. What do you recommend to CEO of MNP Suits to do, to increase the Company's Operating Income in the next year?
3. 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 2:** 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)*

**PROBLEM 3:** 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)***



**THE END**