12. ACTIVITY BASED COSTING

ASSIGNMENT SOLUTIONS

PROBLEM NO. 1

i) Statement Showing Overhead Cost per unit "Traditional Method"

	Gel Pen (Rs.)	Ball Pen (Rs.)
Units	5,500	24,000
Overheads (Rs.) (Refer to W.N.)	4,80,000 (20 x 24,000 hrs.)	10,80,000 (20 x 54,000 hrs.)
Overhead Rate per unit (Rs.)	87.27 (Rs. 4,80,000 / 5,500 units)	45 (Rs. 10,80,000 /24,000 units)

Working Notes:

Overhead Rate per Machine Hour: $\frac{\text{Total Overhead incurred by the Company}}{\text{Total Machine Hours}}$

$$= \frac{4,75,020 + 5,79,988 + 5,04,992}{24,000 \text{ hours} + 54,000 \text{ hours}} = \frac{\text{Rs.}15,60,000}{78,000 \text{ hours}}$$

= Rs. 20 per machine hour

ii) Statement Showing "Activity Based Overhead Cost":

Activity Cost Pool	Cost Driver	Ratio	Total Amount (Rs.)	Gel Pen (Rs.)	Ball Pen (Rs.)
Volume Related Activity Costs	Machine hours	24:54	4,75,020	1,46,160	3,28,860
Setup Related Costs	No. of Setups	30:56	5,79,988	2,02,321	3,77,667
Purchase Related Costs	No. of Purchase Orders	240:448	5,04,992	1,76,160	3,28,832
Total Cost				5,24,641	10,35,359
Output (units)				5,500	24,000
Unit Cost (Overheads)				95.39	43.13

iii)

	Gel Pen (Rs.)	Ball Pen (Rs.)
Overheads Cost per unit (Rs.) (Traditional Method)	87.27	45
Overheads Cost per unit (Rs.) (ABC)	95.39	43.13
Difference per unit	-8.12	+1.87

(Volume related activity cost, set up related costs and purchase related cost can also be calculated under Activity Base Costing using Cost driver rate. However, there will be no changes in the final answer.)

PROBLEM NO. 2

The total production overheads are Rs.26,00,000:

Product A: 10,000 × Rs. 30 = Rs. 3,00,000

Product B: 20,000 × Rs. 40 = Rs. 8,00,000

Product C: 30,000 × Rs. 50 = Rs. 15,00,000

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

Statement Showing "Activity Based Production Cost"

Activity Cost Pool	Cost Driver	Ratio	Total Amount (Rs.)	A (Rs.)	B (Rs.)	C (Rs.)
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	Setups	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 Produces				10,000	20,000	30,000
Unit Cost (Overheads)				70.49	44.25	33.67
Add: Conversion Cost (Material + Labour)				80	80	90
Total				150.49	124.25	123.67

PROBLEM NO. 3

i) Calculation of cost driver rate:

Cost pool	Budgeted overheads (Rs.)	Cost driver	Cost driver rate (Rs.)
Material procurement	18,42,000	1,200	1,535.00
Material handling	8,50,000	1,240	685.48
Maintenance	24,56,000	17,550	139.94
Set-up	9,12,000	1,450	628.97
Quality control	4,42,000	1,820	242.86

ii) Calculation of cost for the batch:

Particulars	Amount (Rs.)	Amount (Rs.)
Material cost		24,62,000.00
Wages		4,68,500.00
Overheads:		
- Material procurement (Rs.1,535×56 orders)	85,960.00	
- Material handling (Rs.685.48×84 movements)	57,580.32	
- Maintenance (Rs.139.94×1,420 hours)	1,98,714.80	
- Set-up (Rs.628.97×60 set-ups)	37,738.20	
- Quality control (Rs.242.86×18 inspections)	4,371.48	3,84,364.80
Total Cost		33,14,864.80
No. of units		7,600
Cost per unit		**436.17**

PROBLEM NO. 4

i) Statement of cost allocation to each product from each activity

	Product			
	M (Rs.)	S (Rs.)	T (Rs.)	Total (Rs.)
Power (Refer to working note)	8,00,000 (10,000 kWh ×Rs.80)	16,00,000 (20,000 kWh × Rs.80)	12,00,000 (15,000 kWh × Rs.80)	36,00,000
Quality Inspections (Refer to working note)	21,00,000 (3,500 inspections × Rs.600)	15,00,000 (2,500 inspections × Rs.600)	18,00,000 (3,000 inspections × Rs.600)	54,00,000

Working Note:

Rate per unit of cost driver:

Power: (Rs. 40,00,000 ÷ 50,000 kWh) = Rs.80/kWh

Quality Inspection: (Rs.60,00,000 ÷ 10,000 inspections) = Rs.600 per inspection

ii) Calculation of cost of unused capacity for each activity:

Particulars	Amount (Rs.)
Power (Rs.40,00,000 - Rs.36,00,000)	4,00,000
Quality Inspections (Rs.60,00,000 - Rs.54,00,000)	6,00,000
Total cost of unused capacity	10,00,000

iii) Factors management consider in choosing a capacity level to compute the budgeted fixed overhead cost rate:

- Effect on product costing & capacity management
- Effect on pricing decisions.
- Effect on performance evaluation
- Effect on financial statements
- Regulatory requirements.
- Difficulties in forecasting for any capacity level.

PROBLEM NO. 5

i) Absorption Costing System

Operating Income:-

Particulars	Lemon	Grapes	Papaya	Total
Revenue	79,350	2,10,060	1,20,990	4,10,400
Less:- Cost of Goods sold	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

Overhead Allocation Rate:-

Activity	Total costs	Quantity of cost Allocation Base	Overhead allocation rate
Ordering	15,600	156 Purchase Orders	100.00
Delivery	25,200	315 Purchase Orders	80.00
Shelf stocking	17,280	864 purchase Orders	20.00
Customer Support	30,720	1,53,600 Items Sold	0.20

Store Support Cost

Particulars	Cost Driver	Lemon	Grapes	Papaya	Total
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

Operating Income:-

Particulars	Lemon	Grapes	Papaya	Total
Revenue	79,350	2,10,060	1,20,990	4,10,400
Less:- Cost of Goods sold	60,000	1,50,000	90,000	3,00,000

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

Comparison:-

Particulars	Lemon	Grapes	Papaya	Total
Under Traditional Costing System	1.70%	7.17%	3.30%	4.97%
Under ABC System	10.78%%	0.60%	8.75%	4.97%

PROBLEM NO. 6

iii) Statement Showing "Activity Rate":

Activity	Activity Cost [a] (Rs.)	Activity Driver	No. of Units of Activity Driver [b]	Activity Rate [a] / [b] (Rs.)
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

iv) Statement Showing "Cost of Product":

Activity	Checking Accounts (Rs.)	Personal Loans (Rs.)	Gold Visa (Rs.)
Providing ATM Service	90,000 (1,80,000 tr.× Rs. 0.50)	---	10,000 (20,000 tr. × Rs. 0.50)
Computer Processing	8,00,000 (20,00,000 tr. × Rs. 0.40)	80,000 (2,00,000 tr. × Rs. 0.40)	1,20,000 (3,00,000 tr. × Rs. 0.40)
Issuing Statements	4,80,000 (3,00,000 st. × Rs. 1.60)	80,000 (50,000 st. × Rs.1.60)	2,40,000 (1,50,000 st. × Rs. 1.60)
Customer Inquiries	2,10,000 (3,50,000 min. × Rs. 0.60)	54,000 (90,000 min. × Rs. 0.60)	96,000 (1,60,000 min. × Rs. 0.60)
Total Cost [a]	Rs. 15,80,000	Rs. 2,14,000	Rs. 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

PROBLEM NO. 7

(i). Overheads application base : Direct Labour hours

	Equipment	Equipment
	Y	Z
Direct material cost	300	450
Direct labour cost	450	600
Overheads*	186.38	248.50
	936.38	1,298.50

*Predetermined rate = Budgeted Overheads / Budgeted direct labour hours

= 12,42,500/20,000 hours = 62.125

Estimation of Cost driver Rate

Activity	Overhead cost	Cost driver level	Cost driver rate
Order processing	2,10,000	600 Orders processed	350
Machine processing	8,75,000	50,000 Machine hours	17.50
Inspection	1,57,500	15,000 Inspection hours	10.50

	Equipment	Equipment
	Y	Z
Direct material cost	300	450
Direct labour cost	450	600
Prime Cost	**750**	**1,050**
Overhead Cost		
Order Processing 350:250	1,22,500	87,500
Machine Processing 23,000: 27,000	4,02,500	4,72,500
Inspection 4,000:11,000	42,000	1,15,500
Total Overhead cost	5,67,000	6,75,500

Per Unit Cost		
5,67,000/2,500	226.80	216.16
6,75,500/3,125		
	976.80	1,266.16

	Equipment	Equipment
	Y	Z
Unit Manufacturing cost- using direct labour hours as an application base	936.38	1,298.50
Unit manufacturing cost using Activity based costing	976.80	1,266.16
Cost distortion	(-)40.42	+ 32.34

Low volume product Y is under – Costed and high volume product Z is over costed using direct labour hours for overhead absorption.

PROBLEM NO. 8

Workings:-

Total Labour hours and Overhead cost

Particulars	Product X	Product Y	Product Z	Total
Production units	45,000	52,500	30,000	1,27,500
Hours 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	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	24,300	6,075	2,430	

i) Computation of overhead cost per unit

Particulars	Product X	Product Y	Product Z
No. of machine setups	40	160	400
Cost per Driver	24,300	24,00	24,300
Total machine set up cost(A)	9,72,000	38,88,000	97,20,000
No. of purchase orders	400	800	1,200
Cost per driver	6,075	6,075	6,075
Total order processing cost(B)	24,30,000	48,60,000	72,90,000
No. of customers	1,000	2,200	4,800
Cost per driver	2,430	2,430	2,430
Total customer complaint management cost(C)	24,30,000	53,46,000	1,16,64,000
Total overhead cost(A+B+C)	58,32,000	1,40,94,000	2,86,74,000
Production cost	45,000	52,500	30,000
Cost per unit	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	350.00	460.00	410.00
Wages per unit @ 80 per hour	240.00	400.00	560.00
Overhead cost per unit	129.60	268.46	955.80
Total cost per unit	719.60	1,128.46	1,925.80
Profit(25% profit mark-up)	179.90	282.11	481.45
Selling price	899.50	1,410.57	2,407.25

THE END