ACTIVITY BASED COSTING

Definition: It's a method of apportioning overheads to the cost units on the basis of the benefits received from a particular indirect activity e.g., planning, ordering etc. or It's a costing method that identifies activities in an organization and assign the cost of each activity to all products and services according to actual consumption by each.

STEPS OF ABC OPERATIONS

1. Identify the main activities in the organization e.g. purchasing of the materials, handling of the materials, assembly etc.
2. Identify the factors which determines the cost of the activity these are known as the cost drivers e.g., the number of orders, the number of set ups etc.
3. Collect the cost of each activity these is known as the cost pools
4. Allocate the overheads to the products on the basis of their usage on the activities expressed in terms of the cost drivers

CPA MAY 2011 Q 2B

Muungano Ltd. Manufacturers four products branded A, B, C and D. The company operates the traditional absorption costing system. The production manager has suggested that the company should adopt the activity based costing system in determination of cost per product.

The following information relates to the month of April 2011:

Product	A	B	C	D
Machine hours per unit	8	6	4	6
Direct labour per unit (sh)	28	21	14	21
Direct material per unit (sh)	40	50	30	60

Additional information:

1. The products are manufactured in production runs of 10 units and sold in batches of 20 units.
2. Overheads are absorbed using machine hour rate.
3. The quantities produced during the month were 2400 units, 2000 units, 1600 units and 2400 units.
   Of product A, B, C and D respectively.
4. The requisitions raised during the month were 20 units for each product while orders executed were in batches of 10 units for each product.
5. Overheads for the month of production were as follows:

Activity	Cost driver	Amount (sh)
Machining	Machine hours	417200
Set- up	Number of production runs	210000
Stores receiving	Requisition raised	144000
Inspection	Number of production runs	84000
Material handling	Orders e	184800

Required:

1. The unit and the total costs of each product using the traditional absorption costing system (4 marks)
2. The unit and total costs of each product using the activity based costing system (8 marks)

(I) Using traditional/conventional methods.
Overhead Absorption rate based on machine hours = Total overheads /Number of machine hour.

Total number of machine hours: (2400x8) + (2000x6) + (1600x4) +(2400x6) =52000hours

OAR = 1040000/52000 =SH. 20/hour

	A	**B**	**C**	**D**
Direct materials	(2400x40)=96000	(50x2000)=100000	(30x1600)=48000	(60x2400)=144000
Direct Labor	(2400x2/)=67200	(21x2000)=42000	(144x1600)=22400	(21x2400)=50400
Overheads	(2400x8x20)=384000	(2000x6x20)240000	(1600x4x20)=128000	(2400x6x20)=28800
Totals	547200	382000	198400	482400
Cost per unit	547200/2400 =228	382000/2000 =191	198400/1600 =124	482400/2400 =2400

	Machining	2. set up	3. Stores receiving	4.Inspection	Material handling
Cost driver rates	Overhead/Number of machine hours	Overheads/Number of production runs	Overheads/requisition	Overheads/Number Or production run	Overheads /orders executed
	Number of machine hours A =2400x8=19200 B=2000x6=12000 C=1600x4=6400 D=2400x6=14400 Total: 52000	Number of production run A=2400/10=240 B=2000/10=200 C=1600/10=160 D=2400/10=240 Total:840	Number of requestion A=2400/20=120 B=2000/20=100 C=1600/20=80 D=2400/20=120 Total:420	Number of production run =2400/10=240 B=2000/10=200 C=1600/10=160 D=2400/10=240 Total:840	No. of orders executed A=2400/10=240 B=2000/10=200 C=1600/10=160 D=2400/10=240 Total =840
	OAR =417200/52000 =8.02	210000/840 =250	144000/420=342.86	84000/840 =100	184800/840=220

Using Activity Based Costing (ABC)

Cost drivers Rates = overheads/Cost drivers

Using ABC

	A	**B**	**C**	**D**
Direct materials	(2400x40) =96000	50x2000 =100000	30x1600=48000	60x2400=144000
Direct Labor	(2400x2/)=67200	21x2000=42000	(144x1600=22400	(21x2400=50400
Overheads:				
machining	19200x8.02=153984	12000X8.02=96240	(6400x8.02) =51328	14400x8.02=115488
Set up	(240x250)=60000	200x250=100,000	160x250=40,000	240x250=60000
Stores receiving	(120x342.57)=41142.84	100x342.86=34288.7	180x342.857=27428.56	120*342.857=41142
Inspection	(2400x100)=24000	200x100 =20000	160x100=16000	240*100=24000
Material handling	(240x220)=52800	200x220 =44000	160x220=35200	240*220=52800
Total cost	495126.84	436525.7	240356.56	48783
Cost per unit	495126.84/2400 =206.3	436525.7/2000 =218.26	240356.56/1600 =150.22	48783/2400 =20

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a) Briefly explain four bases of apportionment of overheads

b) Tengeneza Ltd makes three main products using broadly the same production methods and equipment for each. A conventional costing system is used at present although Activity based costing (ABC) is being considered.

Details of the three products for a typical period are:

	A	B	C
Labor hours	1	3	2
Machine hours	3	2	6
Material cost sh/unit	40	24	50
Volume in units	1500	2500	14000

Direct labor cost sh.12 per hour and production overheads are absorbed on machine hour basis. The rate for the period is sh. 56 per machine hour. Further analysis shows that the total of production overheads can be divided as follows:

	%
Cost relating to set ups	35
Cost relating to machinery	20
Cost relating to material handling	15
Cost relating to inspection	30
	100

The following activity volumes are associated with the product line for the period as a whole

		Total activities for the period						
	No. of set ups	No. of material movement	No. of inspections					
Product A	75	12	150					
Product B	115	21	180					
Product C	480	87	670					
	670	120	1000					

Required:

(i) Calculate the cost per unit for each product using conventional method

(ii) Calculate the cost per unit for each product using ABC principles

(iii) State the reasons for the difference between the two methods

Using conventional method.

OAR = Total overheads/Total number of machine hours

Machine hours = 1500x3+2x2500+6x14000=93500

56=Total overheads/93500

Total overheads = 56x93500=5236000

Using conventional method

	A	B	C	
Material cost	500x40=60000	24x2500=60000	50x14000=700000	
Labor cost	1500x1x12=18000	2500x3x12=90000	14000x2x12=336000	
Overheads	1500x3x56=252000	2500x2x56=280000	14000x6x56=4704000	
Total	330000	430000	5740000	
CPU	330000/1500 220	430000/2500 172	5740000/14000 410	

Using ABC

Overheads for each activity

Cost relating set up = 35%x5236000=1832600

Cost relating machinery=20%=5236000=1047200

Cost relating to material handling =15%x5236000=785400

Cost relating to inspection =30%x5236000=1570800

Cost Drivers rates = budgeted overheads/cost drivers

1. Set ups = Overheads/number of set ups = 1832600/670 =2735.22
2. Machinery =Overheads/No. of machine hours =1047200/93500=11.2
3. Material handling = overheads /no material movement =785400/120=6545
4. Inspection =Overheads/No. of inspection =1570800/100=1570.8

	A	B	C
Material cost	60000	60000	700000
Labor cost	18000	90000	336000
Overheads			
Set ups	75x2735.22=205141.5	115x2735.22=314550.3	480x2735.22=1312905.6
Machinery	3x1500x11.2=50400	2x2500x11.2=56000	6x14000x11.2=940800
Material handling	12x6545=78540	21x6545=137445	87x6545=569415
Inspection	150x1570.8=235620	180x1570.8=282744	670x1570.8=1052436
	647701.5	940739.3	4911556.6
CPU	647701.5/1500 =431.8	940739.3/2500 =376.3	4911556.6/14000 350

PRACTICE QUESTION

JM is a manufacturing company that makes three products PQR. Data for the period ended last month are follows:

	P	Q	R
Units produced and sold	12000	16000	8000

Selling price per unit	50	70	60
Direct material cost per unit	16	24	20
Direct labor cost per unit	8	12	20
Production overhead	Total	Cost drivers	
Machine costs	102000	Machine hours	
Production scheduling	84000	Machine hours	
Set up cost	54000	No. production runs	
Quality control	49200	N. of production runs	
Receiving material	64800	No. of component of receipt	
Packing material	36000	No. of customers' orders	

Information in the cost drivers is given below

	P	Q	R
Direct labor cost per unit	1	1.5	1
Machine hours per unit	0.5	1	1.5
Number of components per unit	3	5	8
Number of components receipts	18	80	64
Number of customers orders	6	20	10
Number of production runs	6	16	8

Required: Using ABC show the cost and gross profit per unit for each product during the period.

SOLUTION

OAR= Budgeted cost/cost driver

Machine cost= 102000/0.5*12000+1*16000+1.5*8000 =sh.3 per hr

P=3*0.5=1.5
Q=3*1=3
R=3*1.5=4.5
Production scheduling = 84000/0.5*12000+1*16000+1.5*8000=sh.2.5 per hr

P=2.5*0.5=1.25
Q= 2.5*1=2.5
R=2.5*1.5=3.75
Set up cost = 54000/6+16+8=1800
P=1800*6/12000=0.9
Q=1800*16/16000=1.8
R=1800*8/8000=1.8

Quality control = 49200/6+16+8=1640
P=1640*6/12000=0.82
Q=1640*16/16000=1.64
R=1640*8/8000=1.64
Receiving material =64800/18+80+64=400
P=400*18/12000=0.6
Q=400*80/16000=0.2
R=400*64/8000=3.2
Packaging material =36000/6+20+10 =1000
P=1000*6/12000=0.5
Q=1000*20/16000=1.25
R=1000*10/8000=1.25

Activity based costing statement						
	P	Q	R			
Selling price	50	70	60			
Variable overheads:						
Direct material	(16)	(24)	(20)			
Direct Labour	(8)	(12)	(8)			
Gross profit	26	34	32			
Production overheads:						
Machine cost	1.5	3	4.5			
Production scheduling	1.25	2.5	3.75			
Set up cost	0.9	1.8	1.8			
Quality control	0.82	1.64	1.64			
Receiving Material	0.6	2	3.2			
Packaging material	0.15	1.25	1.25			
	20.43	21.81	15.86			

ADVANTAGES OF ACTIVITY BASED COSTING

1. Accurate product costing -it brings accuracy and reliability In product costing determination by focusing on cost and effect in cost incurrence.
2. Information about cost behavior- ABC identifies the real nature of cost behavior and helps in reducing cost and identifying activities which do not add value.
3. Better decision making: improves managers decision making as they can use more reliable product cost data.
4. Cost management – ABC provides cost driver rates and information which are very useful to management for cost management and performance appraisal.

USES/APPLICATION OF ABC

1. Decision making.
2. Pricing policies.
3. Evaluation procedures e.g. performance evaluation
4. Costing policies

FACTORS LIMITING ADOPTION OF ABC/DISADVANTAGES:

1. Inability to establish the appropriate cost drivers
2. Lack of resources sometimes implementing ABC might be expensive