THE PROFESSIONALS' ACADEMY OF COMMERCE

Mock Exam, Summer-2015

Management Accounting (Solution)

Answer to Q-1

Minimum price for making 500 units of AK 100

		Rs.
Materials:		
X	(500 units × 4kg) × Rs.8	16,000
Y	(500 units × 6kg) × Rs.15.08	45,240
Labour:		
Skilled wages	(500 units × 5 hours) × Rs.8	20,000
Opportunity cost	(500 units × 5 hours) × Rs.15	37,500
Unskilled	[(500 × 3) - 900] x 6 × 1.5	5,400
Overheads:		
Variable	(500 units × 2 hours) × Rs.8.75	8,750
Fixed	Incremental spending	4,000
Machine hire	(2 weeks × Rs.2,650)	5,300
Development costs		1,750
Minimum price		**143,940** M-(2)

Material X

The company has enough kilograms of material X in inventory for the contract. When it is used, the invenory of material X will not be replaced. The relevant cost of the material is therefore its opportunity cost, not its replacement cost. The opportunity cost is the higher of its current sale value (Rs.7.50 per kg) or the net saving obtained if it is used as a substitute for material Z (Rs.9.50 - Rs.1.50 = Rs.8 per kg). The relevant cost of material X is therefore Rs.8 per kg. M-(3)

Material Y

Material Y is in regular use, so its relevant cost is its current replacement cost.

	kg		Rs.
Total inventory	10,000		142,750
Purchased six months ago	3,000	(× Rs.13.75)	41,250
Purchased last month	7,000		101,500

Purchase price last month = Rs.101,500/7,000 kg = Rs.14.50 per kg.

Current purchase price = 4% higher = Rs.14.50 × 1.04 = Rs.15.08. M-(3)

Skilled labour

Skilled labour is in short supply. If it is used to make product AK 100, workers will have to be taken off other work. The relevant cost of skilled labour is the wages for the skilled workers for the time spent on AK 100, plus the lost contribution (net of skilled labour cost) from not being able to make units of product B16.

Opportunity cost of skilled labour

Skilled labour cost per unit of Product B16 = Rs.24

Number of hours per unit = 3 hours

Contribution per unit of B16 = Rs.45

Contribution per skilled labour hour from B16 = Rs.15

Opportunity cost of skilled labour if it is used to make AK 100 = (500 × 5) × Rs.15 = Rs.37,500 M-(4)

Unskilled labour

900 unskilled labour will be available at no incremental cost to the company (as it is already being paid and is not fully employed). There is no relevant cost for these hours. The additional 600 hours required will involve extra wage payments, including overtime payments. The relevant cost of these 600 hours is Rs.6 per hour × 150% = Rs.9 per hour, including the overtime premium. M-(3)

Overheads

Variable overheads are included as relevant costs because they will be additional costs if the units of AK 100 are made. The only incremental fixed costs, however, are the extra cash costs of Rs.4,000. The fixed overhead absorption rate is ignored. The additional costs of hiring special finishing machinery are also included as a relevant cost. M-(2)

Development costs

Those costs already incurred are past costs (sunk costs) and are not relevant. The future development costs involve additional expenditure and are included as relevant costs. M-(1)

Answer to Q-2 **Month-wise Cash Budget**

Rs. in '000

		Oct	Nov	Dec
Opening balance		1,000	833.10	708.14
Receipts:				
Collection from hospitals and schools	W-1	842.40	830.70	976.95
Payments:				
Purchases	W-2	(655.20)	(734.76)	(753.48)
Sales tax payable	W-3	(22.10)	(28.90)	(27.20)
Salaries and wages		(95)	(95)	(95)
Rent		(150)	-	-
Selling expenses:	W-4			
- Variable (4% of sales)		(34)	(32)	(28)
- Fixed		(14)	(14)	(14)
Overhead expenses		(39)	(51)	(48)
Total payments		(1,009.30)	(955.66)	(965.68)
Closing balance		833.10	708.14	719.41
		M-(1)	M-(1)	M-(1)

WORKING NOTES:

W-1: Calculation of sales and collections

----------Rs. in '000----------

	Aug	Sep	Oct	Nov	Dec
Purchases	600	520	680	640	560
Add: gross profit (25% of cost)	150	130	170	160	140
Sales - Gross	750	650	850	800	700
Sales to hospitals - 70%	525	455	595	560	490
Add: sales tax @17%	89.25	77.35	101.15	95.20	83.30
	614.25	532.35	696.15	655.20	573.30
Collection from hospitals- A			614.25	532.35	696.15
Sales to schools - 30%	225	195	255	240	210
Add: sales tax @17%	38.25	33.15	43.35	40.80	35.70
	263.25	228.15	298.35	280.80	245.70
Collection from schools - B			228.15	298.35	280.8
Total collection (A+B)			842.40	830.70	976.95
	M-(1)	M-(1)	M-(1)	M-(1)	M-(1)

W-2: Purchases

	----------Rs. in '000----------				
	Aug	Sep	Oct	Nov	Dec
Purchases	600	520	680	640	560
Add: Sales Tax @17%	102	88.40	115.60	108.80	95.20
	702	608.40	795.60	748.80	655.20
Payment to creditors:					
10% - month of purchase			79.56	74.88	65.52
60%-following month			365.04	477.36	449.28
30%- second month			210.60	182.52	238.68
			655.20	734.76	753.48
			M-(1)	M-(1)	M-(1)

W-3: Sales tax

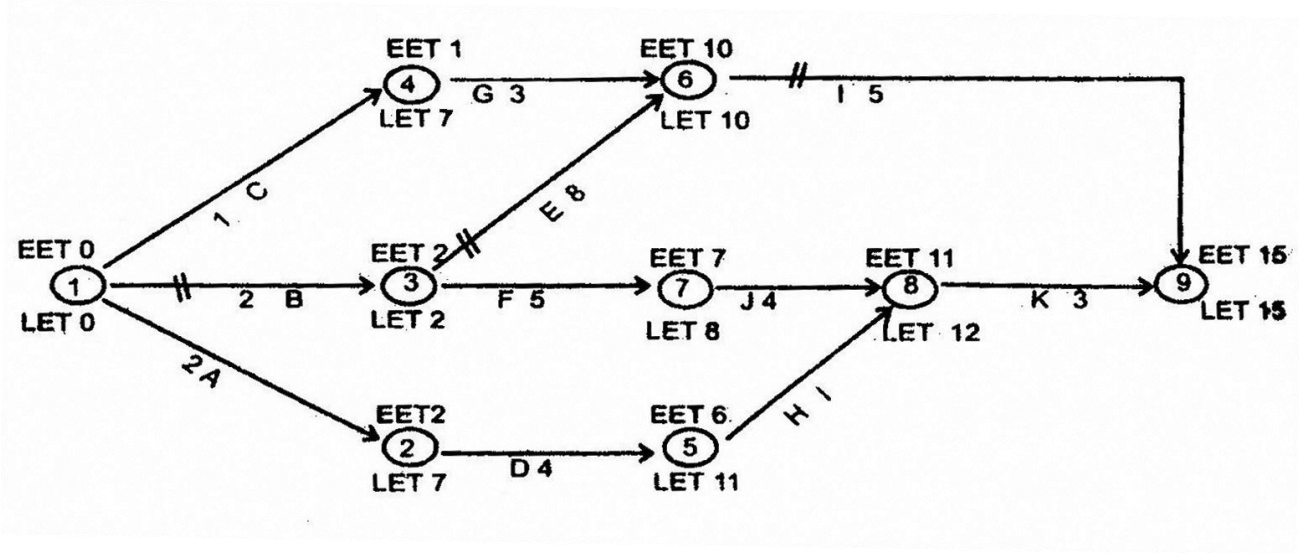
	----------Rs. in '000----------				
Output tax	Aug	Sep	Oct	Nov	Dec
Less: Input tax	127.50	110.50	144.50	136.00	119.00
S.tax payable / (refundable)	(102.00)	(88.40)	(115.60)	(108.80)	(95.20)
Sales tax payments	25.50	22.10	28.90	27.20	23.80
			22.10	28.90	27.20
			M-(1)	M-(1)	M-(1)

W-4: Calculation of variable Selling expenses

	Rs. in '000	
Selling expenses - Sep 2013	40	
Less: fixed expenses - 35%	(14)	
Variable selling expenses	26	
Sales for the month of Sep 2013	650	
Variable selling expenses as a % of sales [26 ÷ 650 × 100]	4%	M-(2)

Answer to Q-3

CRITICAL PATH



M-(4)

Note:
EET: Earliest Event Time
LET: Latest Event Time

(i) Total float:

	A	B	C	D	E	F	G	H	I	J	K
Latest event Time of head event	7	2	7	11	10	8	10	12	15	12	15
Earliest event time of tail event	(0)	(0)	(0)	(2)	(2)	(2)	(1)	(6)	(10)	(7)	(11)
Duration of activity	(2)	(2)	(1)	(4)	(8)	(5)	(3)	(1)	(5)	(4)	(3)
Total Float	5	0	6	5	0	1	6	5	0	1	1

M-(3)

(ii) Critical path and its duration:

Path				Duration (Months)		
A	D	H	K	(2 + 4 + 1 + 3)	=	10
B	F	J	K	(2 + 5 + 4 + 3)	=	14
B	E	I		(2 + 8 + 5)	=	15
C	G	I		(1 + 3 +5)	=	9

Critical path is B E I and duration is 15 Months. M-(3)

Answer to Q-4 (a)

(a) Optimum production plan

Define the variables
Let x = number of units of Xeno to be produced.
Let y = number of units of Yong to be produced.
Let C = contribution.

State the objective function
$C = 30x + 40y$ M-(1)

State the constraints
Build time: $24x + 20y \leq 1{,}800{,}000$
Program time: $16x + 14y \leq 1{,}680{,}000$
Test time: $10x + 4y \leq 720{,}000$ M-(1)

Non-negativity constraints:
$x, y \geq 0$

Sales constraints
$x \leq 85{,}000$
$y \leq 66{,}000$

Draw the graph

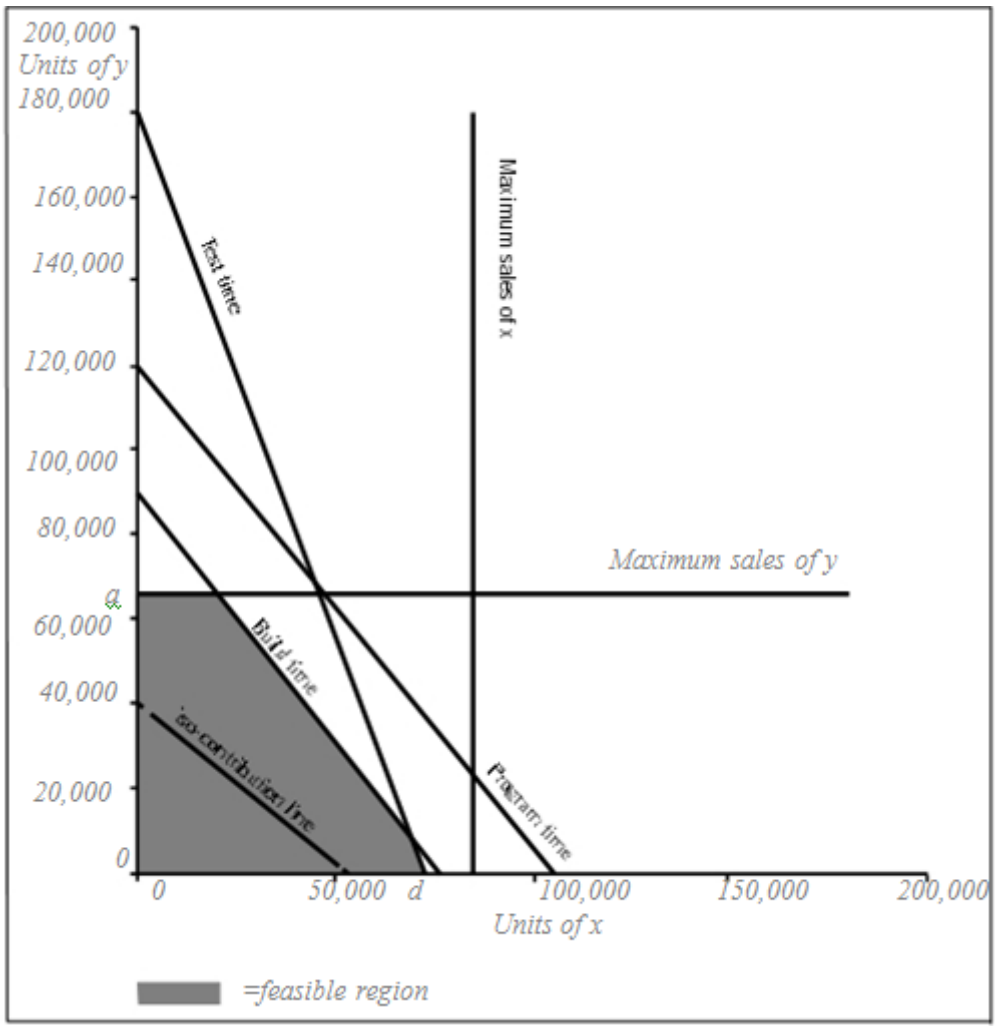
Build time:
If x = 0, y = 1,800,000/20 = 90,000
If y = 0, x = 1,800,000/24 = 75,000 M-(0.5)

Program time:
If x = 0, y = 1,680,000/14 = 120,000
If y = 0, x = 1,680,000/16 = 105,000 M-(0.5)

Test time:
If x = 0, y = 720,000/4 = 180,000 M-(0.5)
If y = 0, x = 720,000/10 = 72,000

Solve using the iso-contribution line

If y = 40,000, C = 40,000 x Rs.40 = Rs.1,600,000 M-(0.5)
If C = Rs.1,600,000 and y = 0, x = Rs.1,600,000/Rs.30 = 53,333·33



M-(3)

Moving the iso-contribution line out to the furthest point on the feasible region, the optimum production point is b. This is the intersection of the build time constraint and the sales constraint for y. Solving the simultaneous equations for these two constraints:

y = 66,000 M-(1)
24x + 20y = 1,800,000
24x + (20 x 66,000) = 1,800,000
24x + 1,320,000 = 1,800,000
24x = 480,000
x = 20,000 M-(1)

C = (20,000 x Rs, 30) + (66,000 x Rs, 40)
= Rs, 600,000 + Rs, 2,640,000 = Rs, 3,240,000

Fixed costs = 3 x Rs, 650,000 = Rs, 1,950,000.
Therefore profit = Rs, 1,290,000. M-(1)

Answer to Q-4 (b)

Sales price operational variance: (actual price - market price) x actual quantity

Commodity 3: (Rs.40·40 - Rs.39·10) x 25,600 = Rs.33,280F

Sales price planning variance: (standard price - market price) x actual quantity Commodity 3:

(Rs.41·60 - Rs.39·10) x 25,600 = Rs.(64,000)A

An alternative approach to the variance calculations for Commodity 3 would be as follows: Sales price operational variance

	Commodity 3
Should now	Rs.39·10
Did	Rs.40·40
Difference	Rs.1·30F

Actual sales quantity	25,600	
Variance	Rs.33,280F	M-(2)

Sales price planning variance

	Commodity 3
Should now	Rs.39·10
Should	Rs.41·60
Difference	Rs.2·50A
Actual sales quantity	25,600
Variance	Rs.64,000A M-(2)

(b) Sales mix variance:

(Actual sales quantity in actual mix at standard margin) - (actual sales quantity in standard mix at standard margin) = Rs.768,640 (w.1 & 2) - Rs.782,006 (w.3) = Rs.13,366 adverse. M-(1)

Working 1: Standard margins per unit:

Budgeted machine hours = (30,000 x 0·2) + (28,000 x 0·6) + (26,000 x 0·8) = 43,600. Overhead absorption rate = Rs.174,400/43,600 = Rs.4 per hour. M-(1.5)

Product	Commodity 1 Rs.	Commodity 2 Rs.	Commodity 3 Rs.
Standard selling price	30	35	41·60
Variable production costs	(18)	(28·40)	(26·40)
Fixed production overheads	(0·8)	(2·4)	(3·2)
Standard profit margin	11.20 M-(0.5)	4·20 M-(0.5)	12 M-(0.5)

Working 2: Actual sales quantity in actual mix at standard profit margin:

Product	**Actual quantity in actual mix**	**Standard profit**	**Rs.**
Commodity 1	29,800	Rs. 11·20	333,760
Commodity 2	30,400	Rs .4·20	127,680
Commodity 3	25,600	Rs. 12	307,200
	85,800 M-(0.5)		768,640 M-(0.5)

Working 3 Actual sales quantity in standard mix at standard profit margin:

Product	**Actual quantity in standard mix**	**Standard profit**	**Rs.**
Commodity 1	85,800 x 30/84 = 30,643	Rs.11·20	343,202
Commodity 2	85,800 x 28/84 = 28,600	Rs. 4·20	120,120
Commodity 3	85,800 x 26/84 = 26,557	Rs.12	318,684
	85,000M-(0.5)		782,006 M-(0.5)

The sales quantity variance = (actual sales quantity in standard mix at standard margin) - (budgeted sales quantity in standard mix at standard profit margin) = Rs.782,006 (w.3 above) - Rs.765,600 (w.4) = Rs.16,406 favourable. M-(1)

Working 4: Budgeted sales quantity in standard mix at standard profit margin:

Product	**Quantity**	**Standard profit**	**Rs**.
Commodity 1	30,000	Rs.11·20	336,000
Commodity 2	28,000	Rs.4·20	117,600
Commodity 3	26,000	Rs.12	312,000
	84,000 M-(0.5)		765,600 M-(0.5)

Answer to Q-5

Gross quantity of input material required to be procured

Total output	4,800 tonnes	
Add-Scrap		
Moulding Dept. -5%	240 tonnes	
Machining Dept. -10%	480 tonnes	
	5,520 tonnes	M-(2)

Selection of sources of supplier and price, at which the inputs are to be procured

Comparative cost of procurement

Sources	Korea	China	Taiwan
Quantity to be supplied (tonnes)	3,600	4,000	5520 (entire qty.)
Price (Rs. Million/tonne)	0.30	0.275	0.32500
Less discount 5%	———	———	0.01625
Net Price	**0.30**	**0.275**	**0.30875**
Add Transport	0.01	0.015	———
Landed Cost	**0.31**	**0.29**	**0.30875**
	M-(1)	M-(1)	M-(1)

The material accordingly will be procured as under

	Rs/ Million
From China – 4,000 @ Rs. 0.29 million / tone	1160.00
From Korea – 1,520 tonne @ Rs. 0.31 million / tone	471.20
Total 5,520	**1631.20**
	M-(1)

Average cost/ tonne being 0.2955 million. Therefore Taiwan is costliest source, so it is ignored.

Computation of annual profitability

		Total 4,800 / tonne Rs. / million	**Per tonne Rs.**
Material Cost @ 0.2955 / tone	M-(1)	1418.40	295,000
Add: Scrap @ 15%	M-(1)	212.76	44,325
		1631.16	**33,825**
Less: Realizable Value of Scrap			
Moulding Dept: (4.800 x 0.05) tonne @ Rs. 75,000/tonne			
Machine Dept: (4.800 x 0.10) tonne @ Rs. 100,000 / tonne		(18.00)	(3,750)
Net material cost	M-(2)	(48.00)	(10,000)
		1565.16	**326,075**
Labour:			
Moulding Dept.		8.00	1,667
Machining Dept.		24.00	5,000
	M-(1)	**32.00**	**6,667**

Overhead:			
Moulding Dept.		32.00	6,667
Machining Dept.		72.00	15,000
	M-(1)	104.00	21,667
Total cost of production		**1701.16**	**354,409**
Distribution cost (15% of production cost) M-(1)		255.174	53,161
Total Cost		**1956.334**	**407,570**
Sales realization			
Northern Zone: 3,000 tonne @ Rs. 750,000/tonne		2,250.000	———
Southern Zone 1,800 tonne @Rs.1,000,000/tonne		1,800.000	———
	M-(1)	**4,050.000**	**843,750**
Profit	M-(1)	**2,093.666**	**436,180**

Answer to Q-6

a)

The situation is governed by the actions of the manager of BB. Based on a transfer price of Rs.45 per component, the total variable cost per unit of Product B will be Rs.54. M-(1)

Demand	SP Rs.	VC Rs.	Cont per unit Rs.	Total contribution Rs.	Rs.
1,000 units	120	54	66	66,000 M-(1)	
2,000 units	110	54	56	112,000 M-(1)	
3,000 units	100	54	46	138,000 M-(1)	
4,000 units	90	54	36	144,000 M-(1)	
5,000 units	80	54	26	130,000 M-(1)	
6,000 units	67	54	13	78,000 M-(1)	

BB will produce 4,000 units of Product B and will therefore order 4,000 of Component A from AA. M-(1)

	AA Rs.	BB Rs.	ZZ Group Rs.
Revenue	180,000	360,000	360,000 M-(1)
Variable costs	60,000	216,000	96,000 M-(1)
Fixed costs	50,000	75,000	125,000 M-(1)
Profit	70,000	69,000	139,000 M-(1)

(b)

If marginal cost is used as the transfer price the manager of the AA division will not be motivated as there will be no contribution towards the division's fixed costs. The calculations above show that if marginal cost is used as the transfer price AAdivision will record a loss i.e. the size of the fixed costs. If the divisional performance measure is Return on Capital Employed the AA division will be at a disadvantage compared to the BB division.

However using marginal cost as the transfer price will maximise the overall group profit. Therefore there is conflict between 'group' and 'division'. The situation could be overcome by the use of a 'dual pricing' system or a 'two-part tariff' approach.

Dual pricing transfer pricing

A dual rate transfer price uses two separate transfer prices to price each inter-divisional transaction e.g. the supplying division may receive the full cost, plus a mark-up on each transaction and the receiving division may be charged at the marginal cost of each of the transfers. The supplier transfer price is intended to match the market price of the goods or services transferred. The mark-up for the supplying division is assumed to be sufficient to cover its fixed costs and also provide a profit contribution.

This method of transferring with the receiving division being charged at the marginal cost of the supplying division, should ensure that decisions are made that are optimal from the group's perspective. This approach should also meet the performance evaluation of the supplying division since each unit transferred generates a profit. For this reason the supplying division manager is motivated to transfer the product internally.

The outcome of this approach will show the contribution for the group as a whole is less than the sum of the divisional profits. This can be resolved quite simply by a head office accounting adjustment.

Two-part tariff transfer pricing

This approach applies particularly where the supplying division has no capacity constraints. All transfers are made at the short-term marginal cost. The supplying division also charges the receiving division a fixed fee for the privilege of obtaining these transfers at the marginal cost.

The receiving division equates its marginal costs to its marginal revenue to determine the optimum profit-maximizing output level.
The supplying division can recover its fixed costs and earn a profit on the inter-divisional transfers through the fixed fee each period. The fixed fee is intended to compensate the supplying division for tying up some of its capacity for providing products or services that are transferred internally.

The fee is meant to cover a representative portion of the supplying division's fixed cost, plus a further charge to reflect the required return on capital.

Another possibility could be 'a negotiated transfer price'.

(The End)