

Test Series: August, 2017

MOCK TEST PAPER – 1

FINAL COURSE: GROUP – II

PAPER – 5: ADVANCED MANAGEMENT ACCOUNTING

SUGGESTED ANSWERS/HINTS

1. (a) Opportunity Cost of Labour - The G_2 labour has zero opportunity cost as there is no other use for the time already paid for and is available. However, Mini SIAM needs to pay an additional amount for G_1 labour. This amount can be save if the special job were not there.

G_1 labour:

Hours Required	250
Hours Available	<u>150</u>
Extra Hours Needed	100
Cost per hour (Rs.630/42hrs)	<u>Rs. 15</u>
Opportunity Cost	<u>Rs.1,500</u>

Thus, the 'Opportunity Cost of Labour' for completing the special job is Rs. 1,500.

Opportunity Cost of Material - Mini SIAM has no alternative use for the R_1 , they must dispose of it at a cost of Rs. 1,250. Thus, Mini SIAM actually saves Rs. 1,250 by using the materials for the NIA Industries' special job. Consequently, the 'Opportunity Cost of Material' is - Rs. 1,250 (i.e., the opportunity cost of this resource is negative).

The *minimum price* is the price at which Mini SIAM just recovers its 'Opportunity Cost. Mini SIAM's 'Total Opportunity Cost' is Rs.250 (Rs. 1,500 – Rs. 1,250). Accordingly, minimum Price for the Special Job is Rs.250.

(b) Analysis of WIP Account

	November	December
Opening WIP	36,000	55,100
Add: Direct Materials Usage	50,000	56,000
Add: Direct Labor	53,100	69,000
Add: Variable Overhead	25,000	29,000
Total Inflow into WIP	1,64,100	2,09,100
Less: Variable Cost of Goods Manufactured	1,09,000	1,14,800
Ending WIP	55,100	94,300

Analysis of Finished Goods Inventory Account

	November	December
Opening Finished Goods	44,000	30,000
Add: Cost of Goods Manufactured	1,09,000	1,14,800
Cost of Goods Available for Sale	1,53,000	1,44,800
Less: Cost of Goods Sold	1,23,000	99,800
Ending Finished Goods Inventory	30,000	45,000

(c) **Statement Showing "Cost Reduction Programme"**

		X (Rs.)	Y (Rs.)
(i)	Current Period Selling Price <i>per unit</i>	10,000	12,000
(ii)	Variable Cost for X (75%) & Y (70%) of (i)	7,500	8,400
(iii)	Next Period Selling Price <i>per unit</i>	8,000	9,000
(iv)	Variable Cost for X (75%) & Y (70%) of (iii)	6,000	6,300
(v)	Cost Reduction in Variable Cost <i>per unit</i> (ii)- (iv)	1,500	2,100
(vi)	Next Period Contribution <i>per unit</i> (iii)- (iv)	2,000	2,700
(vii)	Desired BEP <i>in units</i>	400 units	400 units
(viii)	Fixed Cost for next period (vi × vii)	8,00,000	10,80,000
(ix)	Current Period's Fixed Cost	10,00,000	15,00,000
(x)	Cost Reduction in Fixed Cost	2,00,000	4,20,000

- (d) R_1C_1 appears at the intersection of R_1 and C_1 . Hence, it will have its zero replaced by minimum of a, b, c, or d in the next operation since the number of lines to cover zeros is less than 3.

In the next step, a or b or c or d will have one zero. Then, number of lines will be 3, the order of the matrix. Assignments will be made to the Zeros. Hence, R_1C_1 cannot figure in this.

Interpretation

An assignment of R_1C_1 will eliminate the use of other costs available on R_1 and C_1 entirely. The left over will be a, b, c, or d combinations which are more than zero. Hence, R_1C_1 taking on assignment will be non-optimal.

2. (a) **Statement Showing Recommended Selling Price**

	100 Units (per Unit)		200 units (per Unit)	
Department KTS:				
Direct Labour	36 hrs. × Rs.3	108.00	36 Hrs. × 0.80 × Rs.3	86.40

Overtime Premium [#]		0.00		10.80
Total Labour Cost (A)		108.00		97.20
Variable Overheads	36hrs. × Rs. 10	360.00	36 Hrs. × 0.80 × Rs. 10	288.00
Fixed Overheads	36hrs. × Rs. 11	396.00	36 Hrs. × 0.80 × Rs.11	316.80
Total Overheads (B)		756.00		604.80
Department KTW:				
Direct Labour	18hrs. × Rs. 2.5	45.00	18 Hrs. × 0.70 × Rs.2.5	31.50
Overtime Premium		0.00		0.00
Total Labour Cost (C)		45.00		31.50
Variable Overheads	18hrs. × Rs. 6	108.00	18 Hrs. × 0.70 × Rs.6	75.60
Fixed Overheads	18hrs. × Rs. 7	126.00	18 Hrs. × 0.70 × Rs.7	88.20
Total Overheads (D)		234.00		163.80
Special Tool (E)	Rs. 5,500 / 100	55.00	Rs. 5,500 / 200	27.50
Direct Material (F)		36.00		32.40
Profit on Labour (10%)	Rs. (108 + 45) × 10%	15.30	Rs.(97.20 + 31.50) × 10%	12.87
Profit on Overheads (15%)	Rs. (756+234) × 15%	148.50	Rs.(604.80 +163.80) × 15%	115.29
Total Profit (G)		163.80		128.16
Recommended Selling Price [(A)+ (B)+(C) + (D)+(E)+(F)+(G)]		1,397.80		1,085.36

(#) Statement Showing Overtime Premium

	Department KTS	Department KTW
Direct Labour Hours Available	12,000	8,000
Present workload	7,680	4,200
Balance Direct Labour Hours	4,320	3,800
Hours Required to produce 100 units:	3,600	1,800
Hours Required to produce 200 units:	5,760 (200 × 36 × 0.80)	2,520 (200 × 18 × 0.70)
Overtime Required to produce 100 units	---	---
Overtime Required to produce 200 units	1,440 Hrs	---
Overtime Premium	10.8\$ per Unit	---

(\$) 1,440 Hrs × 3 × 50% / 200 Units

- (b) (i) 'Learning Curve Theory' will not be applicable as *alloy combination of the input metal is quite different* among the suppliers hence learning experience with one type of metal may not be beneficial for the workers to deal with other metal with separate alloy composition.
- (ii) 'Learning Curve Theory' will not be applicable as in this situation *rotation of labour is done frequently*, labours will not be able to get the benefit of learning and apply their learning. Hence, learning curve theory can not be applied.
- (iii) 'Learning Curve Theory' will not be applicable as in this situation as *workers are skilled and employed for a long time*, they have already achieved maximum level of expertise by taking advantage of learning. Hence, at this point of time learning curve theory can not be applied.
- (iv) 'Learning Curve Theory' will not be applicable as indirect materials are the materials which are not used directly in the production (not directly proportionate with volume of output) and usually used machines (e.g. lubricants, spares parts etc.) with less human interactions. Adverse usage of indirect materials can be controlled through proper monitoring and appropriate standard settings and not from applying learning curve theory.

3. (a)

$C_j \rightarrow$			6	4	10	0	0	0	Min.
C_B	Basic Variable	Quantity	X_1	X_2	X_3	S_1	S_2	S_3	Ratio
0	S_1	400	0	$4/3$	0	1	$-1/3$	0	300
6	X_1	400	1	$2/3$	2	0	$1/3$	0	600
0	S_3	400	0	$5/3$	0	0	$-2/3$	1	$\leftarrow 240$
$Z_j = \sum C_B X_j$			6	4	12	0	2	0	
$C_j - Z_j$			0	$0\uparrow$	-2	0	-2	0	

- (i) Yes, because the given solution has no artificial variables in the basic column.
- (ii) Perform one more iteration with X_2 :

$C_j \rightarrow$			6	4	10	0	0	0
C_B	Basic Variable	Quantity	X_1	X_2	X_3	S_1	S_2	S_3
0	S_1	80	0	0	0	1	$1/5$	$-4/5$
6	X_1	240	1	0	2	0	$3/5$	$-2/5$
4	X_2	240	0	1	0	0	$-2/5$	$3/5$
$Z_j = \sum C_B X_j$			6	4	12	0	2	0
$C_j - Z_j$			0	0	-2	0	-2	0

- (iii) Shadow Price is Rs.0, Rs.2 and Rs.0 (or any other given monetary unit) for Constraint 1, Constraint 2 and Constraint 3 respectively and same has been obtained from row $C_j - Z_j$.
- (iv) $C_j - Z_j$ for X_3 being -2 , production of each unit of X_3 would cause a reduction of Rs.2 (or any other given monetary unit). Thus, the price for X_3 should be increased by at least two rupee per unit to ensure no reduction of profits.
- (v) Original Constraint Inequality with the coefficient of variables:

Let us consider the given iteration is the 2nd one. The first iteration (I_1) must have had S_2 instead of X_1 . Row X_1 of I_2 has been computed by dividing the S_2 row of I_1 by 3. S_2 of I_1 (in Identity Matrix) would have been 1. Now it is $1/3$. Working backwards, we multiply row X_1 of I_2 by 3 to get Row S_2 of I_1 .

Original Row S_2 [X_1 of $I_2 \times 3$]:

$$(1X_1 + 2/3X_2 + 2X_3) \times 3 \leq 400 \times 3$$

Or

$$3X_1 + 2X_2 + 6X_3 \leq 1,200$$

Similarly **Original Row S_1 [S_1 of $I_2 + X_1$ of I_2]:**

$$(0X_1 + 4/3X_2 + 0X_3) + (1X_1 + 2/3X_2 + 2X_3) \leq 400 + 400$$

Or

$$X_1 + 2X_2 + 2X_3 \leq 800$$

Similarly **Original Row S_3 [S_3 of $I_2 + 2 \times X_1$ of I_2]:**

$$0X_1 + 5/3X_2 + 0X_3 + (1X_1 + 2/3X_2 + 2X_3) \times 2 \leq 400 + 400 \times 2$$

Or

$$2X_1 + 3X_2 + 4X_3 \leq 1,200$$



Original Constraint Inequality (with the coefficient of variables) can also be traced through algebraic method by solving through *system of equations*.

(b) Working Note

Details	Working	Amount (Rs.)
Selling Price	$\frac{\text{Rs. 4,99,200}}{1,200 \text{ units}}$	416
Raw Materials	$\frac{\text{Rs. 1,68,000}}{1,400 \text{ units}}$	120

Labour	$\frac{\text{Rs.1,05,000}}{1,750 \text{ units}^*}$	60
<i>*Equivalent units (1,400 units / 80%)</i>		
Variable Overheads	$\frac{\text{Rs.42,000}}{1,400 \text{ units}}$	30
Manufacturing Cost (Variable) [Rs.120 + Rs.60 + Rs.30]		210
Distribution Overheads	$\frac{\text{Rs.19,200}}{1,200 \text{ units}}$	16
Total Variable Cost [Rs.210 + Rs.16]		226
Contribution [Rs.416 - Rs.226]		190
Fixed Cost		
Factory	Rs. 1,20,000	
Administration	Rs. 40,000	
Selling	Rs. 40,000	2,00,000

Standard Profit for 1,200 Units Sold

Details	Working	Amount (Rs.)
Contribution	1,200 units $\times$ Rs. 190	2,28,000
Less: Fixed Costs		2,00,000
Profit		28,000

Reconciliation between Budgeted and Actual Profit

Details	Working	Amount (Rs.)
Budgeted Profit	(2,000 units $\times$ Rs. 190 – Rs. 2,00,000)	1,80,000
Less: Volume variance	(800 units $\times$ Rs.190)	1,52,000
Standard Profit		28,000
Factors causing loss:		
Units Scrapped	(100 units $\times$ Rs.210)	21,000
Labour Inefficiency	(350 units $\times$ Rs.60)	21,000
Undervaluation of Closing Stock	{100 units $\times$ (Rs.210 – Rs.180)}	3,000
Actual Profit		(-)17,000

4. (a) Statement Showing 'Customer Profitability Analysis'

Particulars	V ₁	V ₂	Channel Total	V ₃	V ₄	Channel Total
	Small Stores			Large Stores		
Revenue at List Price	1,60,000	1,80,000	3,40,000	25,50,000	12,00,000	37,50,000
Discount	8,000	18,000	26,000	4,59,000	1,44,000	6,03,000
Net Revenue	152,000	1,62,000	3,14,000	20,91,000	10,56,000	31,47,000
Variable Costs	1,28,000	1,44,000	2,72,000	20,40,000	9,60,000	30,00,000
Contribution Margin	24,000	18,000	42,000	51,000	96,000	1,47,000
Order Processing	3,000	6,750	9,750	4,500	2,250	6,750
Regular Deliveries	1,500	3,375	4,875	2,250	1,125	3,375
Expedited Deliveries	2,500	---	2,500	2,500	---	2,500
Customer Profit	17,000	7,875	24,875	41,750	92,625	1,34,375
Channel Cost			20,250			48,375
Channel Profit			4,625			86,000

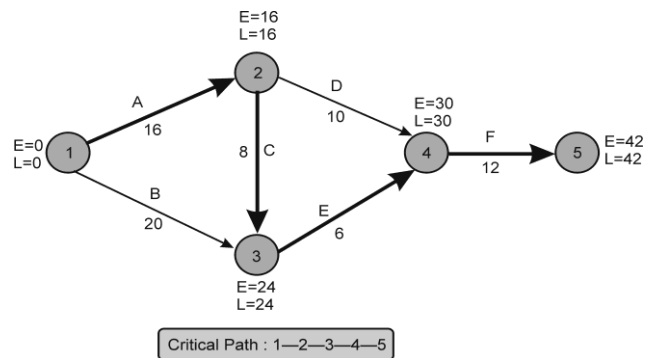
Suggestions

VMCC is only just at breakeven point with small pharmaceuticals. To improve profit VMCC should:

- (i) Coordinate with V₂ to *increase order size* and try to *negotiate a smaller discount*.
- (ii) Try to work with V₁ to reduce number of expedited deliveries.

VMCC makes substantial profit from the large pharmaceuticals. VMCC may give *little extra attention* on V₄ as V₄ is most favorable customer and its order is for large quantities. For V₃, VMCC may have *no options* as V₃ accounts more than 50% of Sales.

(b) (i) The **Network** for the given problem:



(ii) **Critical Path:** 1-2-3-4-5 (A-C-E-F).

(iii) Total Float and Free Float for each activity:

Activity	Duration	EST	EFT	LST	LFT	Slack of Tail Event	Slack of Head Event	Total Float	Free Float
	D _{ij}	E _i	E _i + D _{ij}	L _j - D _{ij}	L _j	L _i - E _i	L _j - E _j	LST - EST	Total Float - Slack of Head Even
A (1-2)	16	0	16	0	16	0	0	0	0
B (1-3)	20	0	20	4	24	0	0	4	4
C (2-3)	8	16	24	16	24	0	0	0	0
D (2-4)	10	16	26	20	30	0	0	4	4
E (3-4)	6	24	30	24	30	0	0	0	0
F (4-5)	12	30	42	30	42	0	0	0	0

5. (a) (i) Gourmet and high-end restaurants recognises Natural Spices on the basis of its *high quality* of spices. Therefore, quality is most critical success factor of Natural Spices. There are other factors which cannot be ignore such as price, delivery options, attractive packing etc. But all are secondary to the quality.
- (ii) Deliberate action of cutting price to increase sales volume indicates that firm is intending to expand its market to retail market and street shops which is price sensitive.

Purchase Price Variance is clearly indicating that firm has purchased raw material at lower price which may be due to buying of lower quality of material. Similarly positive *Efficiency Variance* is indicating cost cutting and stretching resources.

It appears that firm is intending to expand its market to retail market and street shops by not only reducing the price but also compromising its quality which is opposing its current strategy of *high quality*.

Management should monitor the trends of variances on regular basis and take appropriate action in case of evidence of permanent decline in quality. Here, customer feedback is also very important.

(b) **Workings**

Statement Showing 'Non-unit Level Overhead Costs'

Particulars	Current Situation	Proposed Situation
No. of Production Runs/Setups	42	40 $\left(\frac{960 \text{ runs} \times 42 \text{ setup}}{1,008 \text{ units}} \right)$
Cost per Setup	Rs. 450	Rs. 360
Production Units <i>per run</i>	960 units	1,008 units
Production Units	40,320 (960 units × 42)	40,320
Engineering Hrs.	500	422
Engineering Cost <i>per hour</i>	Rs. 10	Rs. 10

Requirement of Question

(i) Break Even Point (Changed Scenario)

Break Even Point

$$\begin{aligned} &= \frac{\text{Fixed Cost} + (\text{Setup Cost} \times \text{No. of Setups}) + (\text{Engineering Costs} \times \text{No. of Engineering Hrs.})}{(\text{Price} - \text{Unit Variable Cost})} \\ &= \frac{\text{Rs. 72,100} + (\text{Rs. 360} \times 40 \text{ Setups}) + (\text{Rs. 10} \times 422 \text{ hrs.})}{(\text{Rs. 10} - \text{Rs. 5})} \\ &= 18,144 \text{ units} \end{aligned}$$

Break Even Point (No of Production Runs)

$$\begin{aligned} &= \frac{\text{Break Even (units)}}{\text{Production (units per run)}} \\ &= \frac{18,144 \text{ units}}{1,008 \text{ units}} \\ &= 18 \text{ Runs} \end{aligned}$$

- (ii) A company should adopt Activity Based Costing (ABC) system for *accurate product costing*, as traditional volume based costing system does not take into account the *Non-unit Level Overhead Costs* such as Setup Cost, Inspection Cost, and Material Handling Cost etc. Cost Analysis under ABC system showed that while these costs are largely fixed with respect to sales volume, but they are not fixed to other appropriate cost drivers. If break up the remaining Rs. 72,100 fixed costs consist of only a small portion of these costs, ABC need not be applied.

However, it may also be noted that the primary study has resulted in cost savings. If the savings in cost are expected to exceed the cost of study and implementing ABC, it may be justified. Further it is pertinent to mention that ABC offers no increase in product-costing accuracy for single-product setting.

6. (a) To overcome the ***optimum decision making*** and ***performance evaluation conflicts*** that can occur with ***marginal cost-based transfer pricing*** following methods has been proposed:

Dual Rate Transfer Pricing System

“With a ‘Dual Rate Transfer Pricing System’ the ‘Receiving Division’ is charged with marginal cost of the intermediate product and ‘Supplying Division’ is credited with full cost per unit plus a profit margin”.

Accordingly Division ‘Dx’ should be allowed to record the transactions at *full cost per unit plus a profit margin*. On the other hand Division ‘Dz’ may be charged only

marginal cost. Any inter divisional profits can be eliminated by accounting adjustment.

Impact:

- Division 'Dx' will earn a profit on inter Division transfers.
- Division 'Dz' can chose the output level at which the marginal cost of the product 'X' is equal to the net marginal revenue of the product 'Z'.

Two Part Transfer Pricing System:

"The 'Two Part Transfer Pricing System' involves transfers being made at the marginal cost per unit of output of the supplying Division plus a lump-sum fixed fee charged by the supplying Division to the receiving Division for the use of the capacity allocated to the intermediate product."

Accordingly Division 'Dx' can transfer its products to Division 'Dz' at *marginal cost per unit* and a *lump-sum fixed fee*.

Impact:

- 'Two Part Transfer Pricing System' will inspire the Division 'Dz' to choose the optimal output level.
- This pricing system also enable the Division 'Dx' to obtain a profit on inter Division transfer.

(b) Cost is not only criterion for deciding in the favour of shut down. Non-cost factors worthy of consideration in this regard are as follows:

- (i) Interest of workers, if the workers are discharged, it may become difficult to get skilled workers later, on reopening of the factory. Also shut-down may create problems.
- (ii) In the face of competition it may difficult to re-establish the market for the product.
- (iii) Plant may become obsolete or depreciate at a faster rate or get rusted. Thus, heavy capital expenditure may have to be incurred on re-opening.

(c) Both Standard Costing and Kaizen Costing are helpful and used for *measurement of performance of a company* but there are differences in approach between the two systems.

Under Standard Costing system standards of all important variables like cost and quantity of materials, labours and overheads are set at the beginning of the year or activity. These set standards are compared with the actual performance to analyse the variances. As a step further all variances are classified as planning and operational variances to distinguish variances that are within the manager's control

and beyond their effort. In brief Standard Costing and Variance Analysis helps in determine the variances and *take post event measures to stop recurrences*.

On the other hand Kaizen Costing *emphasises on continual improvement*. Targets once set at the beginning of the year or activities are updated continuously to reflect the improvement that has already been achieved and that are yet to be achieved.

As a continuous improvement measure Kaizen Costing set new challenges before the workers and managers and helps to improve and control the situation to achieve desired target results. Therefore, if Kaizen costing is used in place of Standard Costing and Variance analysis to measure performance then definitely it will keep Arnav Automobile Ltd. competent enough to head on with the global automobile players.

7. (a) Target cost is the difference between the estimated selling price of a proposed product with specified functionality and quality and target margin. This is a cost management technique that aims to produce and sell products that will ensure the target margin. It is an integral part of the product design. While designing the product the company allocates value and cost to different attributes and quality. Therefore, they use the technique of value engineering and value analysis. The target cost is achieved by assigning cost reduction targets to different operations that are involved in the production process. Eventually, all operations do not achieve the cost reduction targets, but the overall cost reduction target is achieved through team work. Therefore, it is said that target costing fosters team work.

(b) **Statement Showing “Pareto Analysis of Defects”**

Defect Type	No. of Items	% of Total Items	Cumulative Total
Scratches on the surface	110	36.67%	36.67%
Rough edges of lenses	70	23.33%	60.00%
Non-uniform grinding of lenses	60	20.00%	80.00%
Frame colours-shade differences	25	8.33%	88.33%
Power mismatches	20	6.67%	95.00%
End frame not equidistant from the centre	10	3.33%	98.33%
Spots/ Strain on lenses	5	1.67%	100.00%
	300	100.00%	

The company should focus on eliminating *scratches on the surface*, *rough edges of lenses* and *grinding of lenses* related defects which constitute 80% portion, according to Pareto Theory.

- (c) Sunk costs are costs that have been created by a decision made in the past and that cannot be changed by any decision that will be made in the future.

Example, the written down value of assets previously purchased are sunk cost. Sunk costs are not relevant for decision making because they are past cost.

But not all irrelevant costs are sunk cost. For example, a comparison of two alternative production methods may result in identical material costs for both the alternatives. In this case, the direct material cost will remain the same whichever alternative is chosen. In this situation, though direct material cost is the future cost to be incurred in accordance with the production, it is irrelevant, but it is not a sunk cost.

Irrelevant is only with respect to alternatives being considered and not for fund flows whereas for sunk cost there is no further cash flow. Cash flows have already been incurred.

- (d) Characteristic of the dual problem:

- (i) For any linear programming model called primal model, there exists a companion model called the dual model.
- (ii) The number of constraints in the primal model equals the number of variables in the dual model.
- (iii) The number of variables in the primal model equals the number of constraints in the dual model.
- (iv) If the primal model has a maximization objective then the dual model will have a minimization objective and vice-versa. Inequalities get reversed.
- (v) The solution of the primal model yields the solution of the dual model. Also, an optimal simplex table for the dual model yields the optimal solution to the primal model. Further, the objective functions of the two optimal tables will have identical values.
- (vi) Dual of the dual problem is the original primal itself.
- (vii) Feasible solutions to a primal and dual problem are both optimal if the complementary slackness conditions hold. If this relationship does not hold either the primal solution or the dual solution or both are not optimal.
- (viii) If the primal problem has no optimal solution due to infeasibility, then the dual problem will have no optimal solution due to unboundedness.
- (ix) If primal has no optimal solution due to unboundedness, then the dual will have no optimal solution due to infeasibility.

- (e) **Synchronous Manufacturing:** In an all-encompassing management philosophy which includes a set of principles, procedures and techniques where every action is evaluated in terms of common goals of the organization.

The seven principles are:

- (i) Focus on synchronizing the production flow than on idle capacities.
- (ii) Value of time at a bottleneck resource is equal to the throughput rate of products processed by the bottleneck.
- (iii) Value of time at a non-bottleneck resource is negligible.
- (iv) Level of utilization of a non-bottleneck resource is controlled by other constraints within the system.
- (v) Resources must be utilized, not simply activated.
- (vi) Transfer batch should not be equal to process batch.
- (vii) A process batch should be variable both along its route and overtime.