

MOCK TEST PAPER – 2
FINAL COURSE: GROUP – II
PAPER – 5: ADVANCED MANAGEMENT ACCOUNTING
SUGGESTED ANSWERS/HINTS

1. (a) Alternative 1 with no strike:

(Refer W.N.-2, 3)

Cost of settlement is 15% increase i.e. ₹216 per unit

Annual cost of settlement

=54,000 units x ₹216

=₹1,16,64,000

Alternative 2 i.e. if strike goes ahead:

(Refer W.N.-1, 2, 3)

Extra cost:

		₹
(1)	Annual incremental labour cost (Ex. Strike Days Production) [54,000 units-(25 Days x 180 units per day)] x ₹144.00	71,28,000
(2)	Loss of contribution due to loss of sales [1,300 units x ₹ 2,200]	28,60,000
(3)	Incremental labour cost for balance 3,200 units i.e. [(25 Days x 180 units per day)-1,300 units] x ₹144.00	4,60,800
	Overtime Premium (3,200 units x 1,584 x 0.5)	25,34,400
	Payment for Efficiency (3,200 units x 1/9 x 1,584 x 1.5)	8,44,800
(4)	Additional fixed costs	<u>1,00,000</u>
		1,39,28,000

If there is no strike, it will yield a financial benefit of ₹ 22,64,000 (₹ 1,39,28,000 – ₹ 1,16,64,000). Management should accept union's demand.

Working Note:

(1) Statement showing contribution per unit of 'KDK':

	₹
Selling Price	6,000
Less: Variable Costs:	
Labour Cost	1,440

Production Ex. Wages (3,600-1,440)	2,160
Distribution	<u>200</u>
Contribution	<u>2,200</u>

(2) Calculation of labour cost:

Direct labour=40% of production costs of ₹3,600=₹1,440 per unit.

With 15% increase, revised labour cost will be=₹1,440+₹216=₹1,656

With 10% increase, revised labour cost will be=₹1,440+₹144=₹1,584

(3) Statement showing budgeted production:

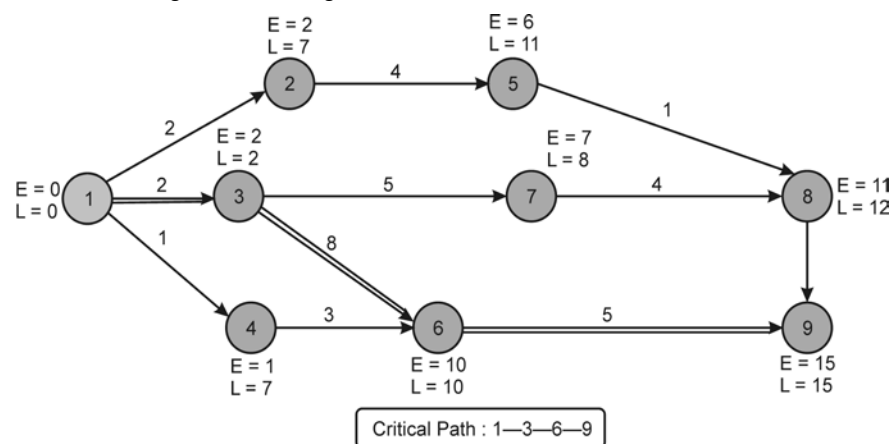
Total time in a day:	8 × 60	480 minutes
Less: Idle time	48 minutes	
Coffee break	20 minutes	
Instructions	22 minutes	
Training	30 minutes	<u>120 minutes</u>
Productive time per day:		360 minutes

Therefore, 'KDK' to be produced per man per day: $(360/180 \times 1) = 2$ units

Since 'KDK' are produced at the rate of 2 'KDK' per man day, so total yearly production will be:

2 units × 90 men × 300 days = 54,000 units of 'KDK'

(b) (i) The arrow diagram for the given data is drawn below:



(ii) The Critical Path is 1—3—6—9

Total Project Duration is 15 weeks.

(iii) The total, free and independent floats are computed in the following table:

Activity	Duration	EST	EFT	LST	LFT	Slack of Tail Event	Slack of Head Event	Total Float	Free Float	Independent 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 Event	Free Float – Slack of Tail Event
1—2	2	0	2	5	7	0	5	5	0	0
1—3	2	0	2	0	2	0	0	0	0	0
1—4	1	0	1	6	7	0	6	6	0	0
2—5	4	2	6	7	11	5	5	5	0	0*
3—6	8	2	10	2	10	0	0	0	0	0
3—7	5	2	7	3	8	0	1	1	0	0
4—6	3	1	4	7	10	6	0	6	6	0
5—8	1	6	7	11	12	5	1	5	4	0*
6—9	5	10	15	10	15	0	0	0	0	0
7—8	4	7	11	8	12	1	1	1	0	0*
8—9	3	11	14	12	15	1	0	1	1	0

(*) Being negative, the independent float is taken to be equal to zero.

2 (a) Statement showing manufacturing cost

	Z2001		Z2002	
	₹/unit		₹/unit	
Material:	203.75		146.05	
Overhead:				
Material handling	43×0.60	25.80	23×0.60	13.80
Assembly Management	2×20.00	40.00	1×20.00	20.00
Machine insertion	24×00.35	8.40	15×00.35	5.25
Manual insertion	18×01.05	18.90	8×01.05	8.40

Quality testing	1x12.50	12.50	1x12.50	12.50
Present cost	309.35		206.00	
Target cost	295.00		180.00	
	Revised Z2001		Revised Z2002	
	₹/unit		₹/unit	
Material	190.60		131.55	
Overhead:				
Material handling	36×0.60	21.60	19×0.60	11.40
Assembly Management	1×20.00	20.00	2×20.00	40.00
Machine insertion	29×00.35	10.15	14×00.35	4.90
Manual insertion	6×01.05	6.30	5×01.05	5.25
Quality testing	2x12.50	25.00	1x12.50	12.50
Present cost	273.65		205.60	
Target cost	295.00		180.00	
	Target Achieved		Target Not achieved	

(b) Limitations of Value Chain Analysis:

1. **Non-availability of data:** Internal data on costs, revenues and assets used for value chain analysis are derived from financial information of a single period. For long term strategic decision making, changes in cost structures, market prices and capital investments etc. may not be readily available.
2. **Identification of stages:** Identifying stages in an industry's value chain is limited by the ability to locate at least one firm that participates in a specific stage. Breaking a value stage into two or more stages when an outside firm does not complete in these stages is strictly judgment.
3. **Ascertainment of cost, revenues and assets:** Finding the costs revenues and assets for each value chain activity poses/gives rise to serious difficulties. There is no scientific approach and much depends upon trial and error and experimentation methods.
4. **Identification of cost drivers:** Isolating cost drivers for each value-creating activity, identifying value chain linkages across activities and computing supplier and customer profit margins present serious challenges.
5. **Resistance from employees:** Value chain analysis is not easily understandable to all employees and hence may face resistance from employees as well as managers.
6. **Science Vs Art:** Value chain analysis is not exact science. It is more "art" than preparing precise accounting reports. Certain judgments and factors of analysis are purely *subjective and differ from person to person*.

- (c) **CPM is a deterministic model** i.e. It does not take into account the uncertainties involved in the estimation of time for execution of a job or an activity. It completely ignores the probabilistic element of the problem. **PERT, however, is a probabilistic model.** It uses three estimates of the activity time; optimistic, pessimistic and most likely; with a view to take into account time uncertainty. Thus, the expected duration of each activity is probabilistic and expected duration indicates that there is fifty per cent probability of getting the job done within that time.

3. (a)

Fast Forward Ltd.

Flexible Budget

Particulars	Levels of Activity		
	80%	90%	100%
Units	8,00,000	9,00,000	10,00,000
Sales (₹) A	80,00,000	87,75,000	95,00,000
Cost of Sales(₹) :			
Variable Cost:			
-Direct Material	28,00,000	29,92,500	33,25,000
-Direct labour	10,00,000	11,25,000	12,50,000
-Direct Expenses	2,00,000	2,25,000	2,50,000
-Salesmen's Commission	4,00,000	4,38,750	4,75,000
Semi Variable Cost:			
-Supervision	80,000	84,000	92,400
-Power	70,000	73,500	80,850
-Heat and Light	40,000	42,000	46,200
-Maintenance	50,000	52,500	57,750
-Salesmen Expenses	60,000	63,000	69,300
-Indirect Labour	1,00,000	1,05,000	1,15,500
-Transport Costs	2,00,000	2,10,000	2,31,000
Fixed Cost:			
-Rent and Rates	1,00,000	1,00,000	1,00,000
-Depreciation	4,00,000	4,00,000	4,00,000
-Advertisement	5,00,000	5,00,000	5,00,000
-Administration	7,50,000	7,50,000	7,50,000
-Sales Department	2,00,000	2,00,000	2,00,000
-General	50,000	50,000	50,000
Total Cost (₹) B	70,00,000	74,11,250	79,93,000
Profits (₹) (A)-(B)	10,00,000	13,63,750	15,07,000

- (b) Relevant costs of producing one unit of the finished product

	₹
Cost of material 'KM' (realisable value)	40
Cost of labour (Being sunk cost)	-
Out-of-pocket expenses	<u>15</u>
	55

Allocated overhead is not relevant for the decision. The customer should be charged ₹ 55 per unit.

- (c) **Throughput Accounting (TA):** Throughput Accounting is a method of performance measurement which relates production and other costs to throughput. Throughput accounting product costs relate to usage of key resources by various products. It assumes that a manager has a given set of resources available. These comprise the existing buildings, capital equipment and labour force. Using these resources, purchased materials and components must be processed to generate sales revenue. To achieve this, maximum amount of throughput is required with the financial definition.

- (d) The factors involved in decisions relating to expansion of capacity are enumerated as below:

- Additional fixed overheads involved should be considered.
- Possible decrease in selling price due to increased production capacity.
- Whether the demand is sufficient to absorb the increased production.

- 4 (a) Let x_1 , x_2 and x_3 respectively be the amounts in tons of grades A, B & C used. The constraints are:

Phosphorus content must not exceed 0.03%

$$0.02x_1 + 0.04x_2 + 0.03x_3 \leq 0.03 (x_1 + x_2 + x_3)$$

Or
$$-x_1 + x_2 \leq 0$$

Ash content must not exceed 3%

$$3x_1 + 2x_2 + 5x_3 \leq 3 (x_1 + x_2 + x_3)$$

Or
$$-x_2 + 2x_3 \leq 0$$

Total quantity of fuel required is not more than 100 tons.

$$x_1 + x_2 + x_3 \leq 100$$

The Mathematical formulation of the problem is

Maximize

$$Z = 12x_1 + 15x_2 + 14x_3$$

Subject to the constraints:

$$\begin{aligned} -x_1 + x_2 &\leq 0 \\ -x_2 + 2x_3 &\leq 0 \\ x_1 + x_2 + x_3 &\leq 100 \\ x_1, x_2, x_3 &\geq 0 \end{aligned}$$

Introducing Slack Variables s_1, s_2, s_3

Maximize

$$Z = 12x_1 + 15x_2 + 14x_3 + 0s_1 + 0s_2 + 0s_3$$

Subject to the constraints:

$$\begin{aligned} -x_1 + x_2 + s_1 &\leq 0 \\ -x_2 + 2x_3 + s_2 &\leq 0 \\ x_1 + x_2 + x_3 + s_3 &\leq 100 \\ x_1, x_2, x_3, s_1, s_2, s_3 &\geq 0 \end{aligned}$$

We shall prepare the simplex tableau as follows:

SIMPLEX TABLEAU-I

$C_j \rightarrow$			12	15	14	0	0	0	Min. Ratio
C_B	Basic Variable (B)	Value of Basic Variables $b(=X_B)$	x_1	x_2	x_3	s_1	s_2	s_3	
0	s_1	0	-1	1	0	1	0	0	$\leftarrow 0$
0	s_2	0	0	-1	2	0	1	0	-
0	s_3	100	1	1	1	0	0	1	100
$Z_j = \sum C_{B_i} X_{j_i}$			0	0	0	0	0	0	
$C_j - Z_j$			12	15↑	14	0	0	0	

SIMPLEX TABLEAU-II

$C_j \rightarrow$			12	15	14	0	0	0	Min. Ratio
C_B	Basic Variable (B)	Value of Basic Variables $b(=X_B)$	x_1	x_2	x_3	s_1	s_2	s_3	
15	x_2	0	-1	1	0	1	0	0	-

0	s ₂	0	-1	0	2	1	1	0	-
0	s ₃	100	2	0	1	-1	0	1	←50
$Z_j = \sum C_{Bi}X_j$			-15	15	0	15	0	0	
$C_j - Z_j$			27↑	0	14	-15	0	0	

SIMPLEX TABLEAU-III

$C_j \rightarrow$			12	15	14	0	0	0	Min. Ratio
C_B	Basic Variable (B)	Value of Basic Variables $b(=X_B)$	x_1	x_2	x_3	s_1	s_2	s_3	
15	x_2	50	0	1	$\frac{1}{2}$	$\frac{1}{2}$	0	$\frac{1}{2}$	100
0	s_2	50	0	0	$\frac{5}{2}$	$\frac{1}{2}$	1	$\frac{1}{2}$	←20
12	x_1	50	1	0	$\frac{1}{2}$	$-\frac{1}{2}$	0	$\frac{1}{2}$	100
$Z_j = \sum C_{Bi}X_j$			12	15	$\frac{27}{2}$	$\frac{3}{2}$	0	$\frac{27}{2}$	
$C_j - Z_j$			0	0	$\frac{1}{2} \uparrow$	$-\frac{3}{2}$	0	$-\frac{27}{2}$	

SIMPLEX TABLEAU-IV

$C_j \rightarrow$			12	15	14	0	0	0
C_B	Basic Variable (B)	Value of Basic Variables $b(=X_B)$	x_1	x_2	x_3	s_1	s_2	s_3
15	x_2	40	0	1	0	$\frac{2}{5}$	$-\frac{1}{5}$	$\frac{2}{5}$
14	x_3	20	0	0	1	$\frac{1}{5}$	$\frac{2}{5}$	$\frac{1}{5}$
12	x_1	40	1	0	0	$-\frac{3}{5}$	$-\frac{1}{5}$	$\frac{2}{5}$

$Z_j = \sum C_{B_i} X_j$	12	15	14	$\frac{8}{5}$	$\frac{1}{5}$	$\frac{68}{5}$
$C_j - Z_j$	0	0	0	$-\frac{8}{5}$	$-\frac{1}{5}$	$-\frac{68}{5}$

Since all numbers in the $C_j - Z_j$ row are either negative or zero, the optimum solution to the given problem has been obtained. The optimum solution is $x_1 = 40$, $x_2 = 40$ and $x_3 = 20$ with maximum $Z = ₹1,360$.

5 (a) Standard hours produced

	Product X	Product Y	Total
Out put (units)	600	400	
Hours per unit	4	6	
Standard hours	2,400	2,400	4,800

Actual hours worked

20 workers $\times$ 8 hours $\times$ 26 days = 4,160

Budgeted hours per month

36,000/12 = 3,000

$$\text{Capacity Ratio} = \frac{\text{Actual Hours}}{\text{Budgeted Hours}} \times 100 = \frac{4,160}{3,000} = 138.67\%$$

$$\text{Efficiency Ratio} = \frac{\text{Standard Hours Produced}}{\text{Actual Hours}} \times 100 = \frac{4,800}{4,160} \times 100 = 115.38\%$$

$$\text{Activity Ratio} = \frac{\text{Standard Hours Produced}}{\text{Budget Hours}} \times 100 = \frac{4,800}{3,000} \times 100 = 160.00\%$$

(b) Statement Showing Amount of Sales Target Fixed & Actual Amount of Contribution Earned

(₹)

Particulars	Zonal Sales Officers			
	M	N	O	P
Commissioned Earned	29,900	23,500	24,500	25,800
Actual Sales (Commission Earned / 5%)	5,98,000	4,70,000	4,90,000	5,16,000
Sales Price Variance	4,000(F)	6,000(A)	5,000(A)	2,000(A)

Sales Volume Variance	6,000(A)	26,000(F)	15,000(F)	8,000(F)
Sales Target/Budgeted Sales	6,00,000	4,50,000	4,80,000	5,10,000
Standard Cost of Sales Target	5,00,000	3,75,000	4,00,000	4,25,000
Standard Margin/ Budgeted Margin	1,00,000	75,000	80,000	85,000
Sales Margin Mix Variance	14,000(A)	8,000(F)	17,000(F)	3,000(A)
Sales Price Variance	4,000(F)	6,000(A)	5,000(A)	2,000(A)
Actual Margin	90,000	77,000	92,000	80,000

Note: Since no information has been given about Sales Margin Quantity Variance, therefore for calculating actual margin the same has been assumed to be zero.

Statement Showing Evaluation of The Performance of Zonal Sales Officers

Particulars	Zonal Sales Officers			
	M	N	O	P
Efficiency towards the Target Sales				
(a) Whether target achieved	No	Yes	Yes	Yes
(b) Actual Sales to Target Sales Ratio	99.67%	104.44%	102.08 %	101.18 %
(c) Rank	IV	I	II	III
Contribution Approach				
(a) Contribution Earned (₹)	90,000	77,000	92,000	80,000
(b) Rank	II	IV	I	III
Margin Vs Sales Ratio				
(a) Standard Margin/Sales Target Ratio	16.67%	16.67%	16.67%	16.67%
(b) Actual Margin Vs Actual Sales Ratio	15.05%	16.38%	18.78%	15.50%
(c) Rank	IV	II	I	III

An analysis on performance of four Zonal Sales Officers based on three base factors, the performance of officer O is the best.

- (c) It is justifiable to sell at a price below marginal cost for a limited period. The circumstances may be:
- Where materials are of perishable nature.
 - Where stocks have been accumulated in large quantities and the market prices have fallen. This will save the carrying cost of stocks, e.g., electronic goods – market prices fall due to quick obsolescence or advanced technological

replenishment.

- (iii) It is essential to reduce the prices to such an extent in order to popularize a new product.
- (iv) Where such reduction enables the firm to boost the sales of other products having larger profit margin.

6. (a) Calculation of variances:

The cost sheet for 1,080 units will appear as under:

Cost	Std. qty.	Std. rate	Std. cost ₹
Direct material	12,960	1.20	15,552
Direct labour	3,240	3.60	11,664
Overheads	3,240	7.20	<u>23,328</u>
			<u>50,544</u>

Material Variances

Material price variance:

$$= 11,400 \text{ Pcs.} \times (\text{₹ } 1.20 - \text{₹ } 1.32) = \text{₹ } 1,368 \text{ (A)}$$

Material usage variance:

$$= \text{₹ } 1.20 \times (12,960 \text{ pcs.} - 11,400 \text{ pcs.})$$

$$= \text{₹ } 1,872 \text{ (F)}$$

Labour Variances

Labour rate variance:

$$= 2,970 \text{ hrs.} (\text{₹ } 3.60 - \text{₹ } 4.20) = \text{₹ } 1,782 \text{ (A)}$$

Labour efficiency variance:

$$= \text{₹ } 3.60 (3,240 \text{ hrs.} - 2,970 \text{ hrs.}) = \text{₹ } 972 \text{ (F)}$$

Overhead variances:

(a) Charged to production as per cost sheet	₹ 23,328
(b) Actual hours × Std. rate: 2,970 hrs. × ₹ 7.20	₹ 21,384
(c) Overheads as per budget	₹ 19,800
(d) Actual overheads	₹ 20,400
Efficiency variance : (a – b)	₹ 1,944 (F)
Capacity variance : (b – c)	₹ 1,584 (F)
Expense variance : (c – d)	₹ 600 (A)
Total variance : (a – d)	₹ 2,928 (F)

(b) N = 18,000 units

O = 9,000 units

Ratio (N:O) = 2:1

Let t = No. of units of 'O' for BEP

N = 2t No. of units for BEP

Contribution of 'N' = ₹ 10.5 per unit

Contribution of 'O' = ₹ 9 per unit

At Break Even Point:

$$\Rightarrow 10.5 \times (2t) + 9 \times t - 15,000 = 0$$

$$\Rightarrow 30t = 15,000$$

$$\Rightarrow t = 500 \text{ units}$$

BEP of 'N' = $2t = 1,000$ units

BEP of 'O' = $t = 500$ units

(c) Tools and techniques for cost reduction :-

1. Budgetary control and standard cost.
2. Work study and organisation and method of procedure.
3. Value analysis.
4. Standardisation.
5. Simplification and variety reduction.
6. Economic batch quantity (E. B. Q.)
7. Coding and classification.
8. Improvement in design.
9. Substitute material utilisation.
10. Automation.
11. Operational Research.
12. Quality Control.
13. Production Planning and Control.
14. Inventory Control.
15. Purchase Scheduling.
16. Job evaluation and merit voting.
17. Training and development.

18. Business forecast.

19. Market Research.

(d) **Going Rate Pricing:** It is a competitive pricing method under which a firm tries to keep its price at the average level charged by the industry. The use of such a practice of pricing is specially useful where it is difficult to measure costs. Adoption of going rate pricing will not only yield fair return but would be least disruptive for industry's harmony.

7. (a) **Degeneracy :** A transportation problem's solution has $m+n-1$ basic variables, (where m, n are the number of rows and columns) which means that the number of occupied cells in such a solution is one less than the number of rows and number of columns.

When the number of occupied cells in a solution is less than $m+n-1$, the solution is called a degenerate solution.

Such a situation is handled by introducing an infinitesimally small allocation 'e' in the least cost and independent cell.

If the number of occupied cells $< m+n-1$ by one, then only one 'e' needs to be introduced. If the number of occupied cells is less by more than one, to the extent of shortage, 'e's will have to be introduced till the condition that no. of occupied cells = $m+n-1$.

(b) The process of zero-base budgeting involves the following steps:

1. Determination of a set of objectives is one of pre-requisites and essential step in the direction of ZBB technique.
2. Deciding about the extent to which the technique of ZBB is to be applied whether in all areas of organizations' activities or only in a few selected areas on trial basis.
3. Identify those areas where decisions are required to be taken.
4. Developing decision packages and ranking them in order of performance.
5. Preparation of budget that is translating decision packages into practicable units/items and allocating financial/resources.

(c) 'Kaizen Costing' is a Japanese term for a number of cost reduction steps that can be used subsequent to issuing a new product design to the factory floor. Some of the activities in the kaizen costing methodology include the elimination of waste in the production, assembly, and distribution processes, as well as the elimination of work steps in any of these areas. Though these points are also covered in the value engineering phase of target costing, the initial value engineering may not uncover all possible cost savings. Thus, kaizen costing is really designed to repeat many of the value engineering steps for as long as a product is produced, constantly refining

the process and thereby stripping out extra costs. The cost reductions resulting from kaizen costing are much smaller than those achieved with value engineering but are still worth the effort since competitive pressures are likely to force down the price of a product over time, and any possible cost savings allow a company to still attain its targeted profit margins while continuing to reduce cost.

- (d) The plan – do – study – act (PDSA) cycle describes the activities a company needs to perform in order to incorporate continuous improvement in its operation. This cycle, is also referred to as the *Shewhart cycle* or the *Deming wheel*. The circular nature of this cycle shows that continuous improvement is a never-ending process. Let's look at the specific steps in the cycle.

Plan: The first step in the PDSA cycle is to plan. Managers must evaluate the current process and make plans based on any problems they find. They need to document all current procedures, collect data, and identify problems. This information should then be studied and used to develop a plan for improvement as well as specific measures to evaluate performance.

Do: The next step in the cycle is implementing the plan (do). During the implementation process managers should document all changes made and collect data for evaluation.

Study/Check: The third step is to study the data collected in the previous phase. The data are evaluated to see whether the plan is achieving the goals established in the plan phase.

Act: The last phase of the cycle is to act on the basis of the results of the first three phases. The best way to accomplish this is to communicate the results to other members in the company and then implement the new procedure if it has been successful. Note that this is a cycle; the next step is to plan again. After we have acted, we need to continue evaluating the process, planning, and repeating the cycle again.

- (e) Usually a conflict between a division of the company and the company as a whole is faced by the management of decentralized units when products or services are exchanged among different divisions of the company. Such a conflict becomes more significant in the case of those concerns where profitability is used as criteria for evaluating the performance of each division. A divisional head in a company under aforesaid set up is free to use a price as a transfer price for goods and services, which may provide incentive. Such a transfer price may fail to achieve the objective of 'Goal congruence' which means a perfect congruence between division's goal and the goal of the company. In case of failure of a division to achieve the objective of 'Goal congruence' the management of the company may dictate their transfer price. Such a interference of management of the company is usually the main basis of conflict between a division and the company as a whole. Further this conflict is aggravated if the management advocates the transfer of goods and services at cost. As such, the transfer

price will not reflect a good picture about the performance of the transferring division. The profitability of the transferring division will not be known by the use of such a transfer price. Each division appreciates the transfer of its goods/services at usual selling price/market price so as to arrive at the correct return / profitability figure, used for measuring the performance. There is no incentive to the transferring division if goods and services are transferred at variable cost.