Purushottam Sir Costing Classes

CA Purushottam Sir teaches "Costing" subject at CA Inter, CMA Inter, CMA Final & CA Final Level

CA Final TOP "Category A Practical Questions" along with Solution For Nov 2020 Exam

- Nov Exams are on its way & every student feels fear from costing subject & students always remain tensed regarding his/her level of preparation. I know you need some helping hand  .
- Here comes this pdf file which contains "Important Questions For Nov 2020 Exam"
- Revising These Questions will ensure revision of more than **70% to 80% Concepts** of Costing.
- It includes most "**Comprehensive**" as well as "**Tricky**" Questions to check your preparation level for Exam.
- **Past Trend** has also been considered in deciding importance of chapters & topic therein in Exam. You also watch this vide :- **https://www.youtube.com/watch?v=EXH3fH_87hs**
- Answer has been presented in "Easy to Understand" Mode. Detailed explanation is also provided wherever required

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QUESTION 1

A company produces and sells a single product. The cost data per unit for the year 2019 is predicted as below:

	Rs. per unit
Direct Material	35
Direct Labour	25
Variable Overheads	15
Selling Price	90

The company has forecast that demand for the product during the year 201 9 will be 28,000 units. However, to satisfy this level of demand, production quantity will be increased?

There are no opening stock and closing stock of the product.

The stock level of material remains unchanged throughout the period.

The following additional information regarding costs and revenue are given:

- 12.5% of the items delivered to customers will be rejected due to specification failure and will require free replacement. The cost of delivering the replacement item is Rs.5 per unit.
- 20% of the items produced will be discovered faulty at the inspection stage before they are delivered to customers.
- 10% of the direct material will be scrapped due to damage while in storage.

Due to above, total quality costs for the year is expected to be Rs.10,75,556.

The company is now considering the following proposal:

1. To introduce training programmes for the workers which, the management of the company believes, will reduce the level of faulty production to 10%. This training programme will cost Rs.4,50,000 per annum.

2. To avail the services of quality control consultant at an annual charges of Rs.50,000 which would reduce the percentage of faulty items delivered to customers to 9.5%.

Required

(i) PREPARE a statement of expected quality costs the company would incur if it accepts the proposal. Costs are to be calculated using the four recognised quality costs heads.

(ii) Would you RECOMMEND the proposal? Give financial and non-financial reasons.

ANSWER :-

(i) **Statement of 'Expected Quality Costs'**

Particulars	Current Situation (Rs.)	Proposed Situation (Rs.)
Prevention Costs	---	4,50,000
Appraisal Costs	---	50,000

External Failure Costs	3,20,000	2,35,120
Internal Failure Costs	7,55,556	3,91,538
Total Quality Costs	10,75,556	11,26,658

Workings

External Failure Cost

Particulars	Current Situation	Proposed Situation
Customer's Demand …(A)	28,000 units	28,000 units
Number of units Dispatched to Customers …(B) $\left(\frac{28{,}000 \text{ units}}{87.5\%}\right); \left(\frac{28{,}000 \text{ units}}{90.5\%}\right)$	32,000 units	30,939 units
Number of units Replaced …(B) – (A)	4,000 units	2,939 units
External Failure Cost {4,000 units × Rs.(35+25+15+5)}; {2,939 units × Rs.(35+25+15+5)}	Rs.3,20,000	Rs.2,35,120

Internal Failure Cost

Particulars	Current Situation	Proposed Situation
Number of units Dispatched to Customers …(A)	32,000 units	30,939 units
Number of units Produced & Rejected …(B) $\left(\frac{32{,}000 \text{ units}}{80\%}\right); \left(\frac{30{,}939 \text{ units}}{90\%}\right)$	40,000 units	34,377 units
Number of units Discovered Faulty … (B) – (A)	8,000 units	3,438 units
Cost of Faulty Production …(D) {8,000 units × Rs.(35+25+15)}; {3,438 units × Rs.(35+25+15)}	Rs.6,00,000	Rs.2,57,850
Material Scrapped $\left(\frac{40{,}000 \text{ units}}{90\%} \times 10\%\right); \left(\frac{34{,}377 \text{ units}}{90\%} \times 10\%\right)$	4,444.44 units	3,819.67 units
Cost of Material Scrapped …(E) {4,444.44 units × Rs.35}; {3,819.67 units × Rs.35}	Rs.1,55,556	Rs.1,33,688
Internal Failure Cost …(D)+(E)	Rs.7,55,556	Rs.3,91,538

(ii)From financial point of view, company should not implement TQM since it result in extra cost of Rs.51103.

Company should implement TQM Proposal from non-financial reasons as prescribed below:

1) Decrease in specification loss may add new customers in future.
2) Decrease in downgrading loss will result in production of goods units leading to more sales.

Point to Remember

1) Cost of good Quality = Prevention cost + Appraisal Cost = Quality Compliance cost
2) Cost of poor quality = Internal failure cost + external failure cost = Quality Non-Compliance Cost

QUESTION 2.

KP Ltd. (KPL) manufactures and sells one product called "KEIA". Managing Director is not happy with its current purchasing and production system. There has been considerable discussion at the corporate level as to use of 'Just in Time' system for "KEIA". As per the opinion of managing director of KPL Ltd. –

"Just-in-time system is a pull system, which responds to demand, in contrast to a push system, in which stocks act as buffers between the different elements of the system such as purchasing, production and sales. By using Just in Time system, it is possible to reduce carrying cost as well as other overheads".

KPL is dependent on contractual labour which has efficiency of 95%, for its production. The labour has to be paid for minimum of 4,000 hours per month to which they produce 3,800 standard hours.

For availing services of labour above 4,000 hours in a month, KPL has to pay overtime rate which is 45% premium to the normal hourly rate of Rs.110 per hour. For avoiding this overtime payment, KPL in its current production and purchase plan utilizes full available normal working hours so that the higher inventory levels in the month of lower demand would be able to meet sales of month with higher demand level. KPL has determined that the cost of holding inventory is Rs.70 per month for each standard hour of output that is held in inventory.

KPL has forecast the demand for its products for the first six months of year 2019 as follows:

Month	Demand (Std. Hrs.)
Jan'19	3,150
Feb'19	3,760
Mar'19	4,060
Apr'19	3,350
May'19	3,650
Jun'19	4,830

Following other information is given:

(i) All other production costs are either fixed or are not driven by labour hours worked.

(ii) Production and sales occur evenly during each month and at present there is no stock at the end of Dec'18.

(iii) The labour are to be paid for their minimum contracted hours in each month irrespective of any purchase and production system.

Required

As a chief accountant you are requested to COMMENT on managing director's view.

ANSWER :-

Please note normally production is presented in number of units e.g. Labour produced 5000 units but in this question production is expressed in terms of standard hours e.g. 3800 hours produced. It means that labour produced production which can be produced in 3800 hours without wasting even a single minute.

Following will be effect of JIT

1. If JIT is not followed, company shall produce extra to utilize all hours hence this will lead to inventory holding cost.
2. If JIT is followed, company shall produce equal to demand. Hence Zero inventory cost. If demand gets higher in any month then it shall need to work overtime hence extra labour cost shall be incurred.

Statement showing "Inventory Holding cost" When JIT is not followed

Particulars	Jan	Feb	Mar	Apr	May	June	Total
Op. stock	**NIL**	650	690	430	880	1030	
Add Production	3800	3800	3800	3800	3800	3800	
Less Sold (Demand)	3150	3760	4060	3350	3650	4830	
Cl. Stock	650	690	430	880	1030	**NIL**	
Av. Stock (Op.+Cl.)/2	325	670	560	655	955	515	

Inventory holding cost @ RS.70 per unit (Rs.)	22750	46900	39200	45850	66850	36050	257600

Total inventory holding cost for 6 months = Rs.257600

Statement showing "Extra Labour cost" When JIT is followed

Particulars	Jan	Feb	Mar	Apr	May	June	Total
Op. stock	**NIL**	**NIL**	**NIL**	**NIL**	**NIL**	**NIL**	
Add Production	3150	3760	4060	3350	3650	4830	
Less Sold (Demand)	3150	3760	4060	3350	3650	4830	
Cl. Stock	**NIL**	**NIL**	**NIL**	**NIL**	**NIL**	**NIL**	
Possible Output hours	3800	3800	3800	3800	3800	3800	
Shortage in output hour **(A)**			260			1030	
Actual Hours required for shortage Hours **(A / 95%)**			273.68			1084.21	
Extra Labour Cost @ Rs.159.50 (Rs. 110 per hour + 45%)			43652			172931	216583

Extra labourcost for 6 months = Rs. 216583

Saving in Adopting JIT = Rs. 257600 - Rs. 216583 = Rs. 41,017

Comments

Company will save Rs.41,017 by adopting JIT Production so it is beneficial to adopt this method but following points should also be considered by organization:-

1. It has to ensure that it receives material from supplier on the exact date & exact time when it needs it so reliability of supplier must be checked.
2. Engineers of company must visit supplier factory & examine quality of raw material to ensure that quality of FG does not get reduced.
3. Company should give training to employees & also motivate them so that their efficiency can be increased above 95%.

QUESTION 3.

A manufacturer is considering implementing Just in time inventory system for some of its raw material purchases. As per the current inventory policy, raw materials required for 1 month's production and finished goods equivalent to the level of 1 week's production are kept in stock. This is done to ensure that the company can cater to sudden spurt in consumers' demand. However, the carrying cost of inventory has been increasing recently. Hence, the consideration to move to a more robust just in time purchasing system that can reduce the inventory carrying cost. Details relevant to raw material inventory are given below:

- Average inventory of raw material held by the company throughout the year is Rs.1 crore. Procurement of raw material for the year is Rs.12 crore. By moving to just in time procurement system, the company aims at eliminating holding this stock completely in its warehouse. Instead, suppliers of these materials are ready to provide the goods as per its production requirements on an immediate basis. Suppliers will now be responsible for quality check of raw material such that the raw material can be used in the assembly line as soon as it is delivered at the company's factory shop floor.
- Increased quality check service done by the suppliers as well as to compensate them for the risk of holding the inventory to provide just in time service, the company is willing to pay a higher price to procure raw material. Therefore, procurement cost will increase by 30%, total procurement cost will be Rs.15.6 crore per year. Consequently, quality check and material handling cost for the company would reduce by Rs.1 crore per year. Similarly, insurance cost on raw material inventory of Rs.20 lakh per year need not be incurred any longer.
- Raw material is stored in a warehouse that costs the company rent of Rs.3 crore per annum. On changing to Just in time procurement, this warehouse space would no longer be required.

- Production is 150,000 per year. The company plans to maintain its finished goods inventory equivalent to 1 week's production. Despite this, in order to have a complete cost benefit analysis, the management is also factoring the possibility of production stoppages due to unavailability of raw material from the suppliers. This could happen due to of delay in delivery or non-conformance of goods to the standard required. Labor works in one 8-hour shift per day and will remain idle if there is no material to work on. Due to stoppage of production for the above reason, it is possible to have stockout of 3,000 units in a year. Stockout represents lost sales opportunity due to unavailability of finished goods, the customer walks away without purchasing any product from the company. Therefore, in order to reduce this opportunity cost and to make up for the lost production hours, labor can work overtime that would cost the company Rs.10 lakh per annum. This is the maximum capacity in terms of hours that the labor can work. With this overtime, stockout can reduce to 2,000 units.
- Currently, sale price of phone is Rs.5,000 per unit, variable production cost is Rs.2,000 per unit while variable selling, general and administration (SG&A) cost is Rs.750 per unit. Raw material procurement cost is currently Rs.800 per unit, that will increase by 30% to Rs.1,040 per unit under Just in time inventory system.
- On an average, the long-term return on investment for the company is 15% per annum.

Required

(i) CALCULATE the benefit or loss if the company decides to move from current system to Just in Time procurement system.
(ii) RECOMMEND factors that the management needs to consider before implementing the just in time procurement system.

ANSWER :-

There are following considerable points

1) Company will pay 30% extra on raw material hence this 30% will become "Cost of JIT" i.e. Rs.12 Crore x 30% = Rs.3.60 Crore
2) Quality checking & material handling cost will reduce by Rs. 1 Crore hence it shall become "Benefit of JIT".
3) Insurance cost of Rs.20 Lakh will not be required in JIT hence it shall become "benefit of JIT"
4) Warehouse Rent of Rs.3 Crore per year will not be required in JIT hence it shall become "benefit of JIT"
5) Company will definitely incur stock out cost on 2000 units since not possible to produce even using overtime hence contribution to be lost on these 2000 units shall become "Cost of JIT"
6) On remaining 1000 units of stock out, we need to analyse whether overtime will be beneficial or not.
   a. If Overtime is not beneficial then contribution to be lost on these 1000 units shall become "Cost of JIT"
   b. If overtime is beneficial then Overtime cost shall become "Cost of JIT"

Working Note 1 cost benefit analysis of 1000 units stock out considering overtime cost

New contribution after JIT = Selling Price – Variable Production cost – Other Variable cost
= Rs.5,000 per unit – [Rs.2,000 p.u. + (1040 – 800) 30% Hike in material price] – Rs.750 p.u.
= Rs.2010 per unit

Contribution on 1000 units = 1000 units x Rs.2010 p.u. = Rs.20,10,000
Overtime cost on these 1000 units = Rs.10,00,000 (Given)

Hence it is beneficial to use overtime for making these 1000 units. Hence Overtime cost of Rs.10,00,000 shall become "Cost of JIT"

(i) Statement showing cost benefit analysis of adopting JIT

Particulars	Amount (Rs.)
Benefits of JIT	
Reduction in Quality Handling Cost	100,00,000
Reduction in insurance cost	20,00,000
Reduction in rent	300,00,000
Cost of JIT	
Extra cost of raw material	360,00,0000
Stock out cost on 2000 units x Rs.2010	40,20,000
Overtime Cost on 1000 units	10,00,000
Net Benefit	**9,80,000**

It is beneficial to implement JIT since initial saving of Rs.9,80,000. If company invest this amount @15% then this benefit will increase to Rs.11,27,000 in One year.

Point to Note:- ICAI considered Interest benefit of reduction in inventory level of raw material but it did not consider interest benefit on FG

Logical Adjustment:- We should logically consider savings due to reduction in working capital due to reduction in raw material inventory i.e. Rs.1 Crore x 15% = Rs.15 Lakh

It should be noted that till Edition 2019 of ICAI SM on SCMPE, ICAI did not considered Saving on reduction in working capital of Rs.1 Crore @15% but logically it should be done. So on a request to clarify same, ICAI confirmed that saving of Rs.15 Lakh due to reduction in working capital should be considered.

(ii) ESSENTIAL PRE-REQUISITE FOR JIT SYSTEM

Following things must be done before company can implement JIT

a. Vendor of raw material must be reliable so he dispatch material on time directly on production-floor.
b. Organization must have implemented TQM.
c. Organization must have implemented preventive maintenance system i.e. repair machines on regular basis without doing wait for breakdown
d. Demand of products must be stable so estimated demand can be calculated
e. Raw material must be of good quality i.e. defect free raw material

QUESTION 4.

NEC Ltd., forms a Committee consisting of its Production, Marketing, and Finance Directors to prepare a budget for the next year. The Committee submits a draft budget as detailed below:

Particulars	Rs.
Selling Price per unit	50
Less: Direct Material Cost per unit	9
Direct Labour Cost per unit	9
Variable Overhead per unit (3 hrs. @ Rs.2)	6
Contribution per unit	26
Budgeted Sales Quantity	25,000 units
Budgeted Contribution (25,000 × Rs.26)	6,50,000
Less: Budgeted Fixed Cost	5,00,000
Budgeted Profit	1,50,000

The Management is not happy with the budgeted profit as it is almost equal to the previous year's profit. Therefore, it asks the Committee to prepare a budget to earn at least a profit of Rs.3,00,000. To achieve the target profit, the Committee reports back with the following suggestions:

The unit selling price should be raised to Rs.55.
The sales volume should be increased by 5,000 units.
To attain the above said increase in sales, the company should spend Rs.40,000 for advertising.
The production time per unit should be reduced.
To win the acceptance of the workers in this regard the hourly rate should be increased by Rs.3 besides an annual group bonus of Rs.30,000.
There is no change in the amount and rates of other expenses. The company has sufficient production capacity.
As the implementation of the above proposal needs the acceptance of the work force to increase the speed of work and to reduce the production time per unit, the Board wants to know the extent of reduction in per unit production time.

Required

(i) CALCULATE the target production time per unit and the time to be reduced per unit.
(ii) IDENTIFY the other problems that may arise in production due to decrease in unit production time and also suggest the remedial measures to be taken.
(iii) STATE the most suitable situation for the adoption of Target Costing.

ANSWER

Statement Showing Target Cost (Direct Labour and Variable Overhead)

Particulars	**Amount (Rs.)**
Target Sales (Rs.55 × 30,000 units)	16,50,000
Less: Target Profit	3,00,000
Less: Direct Material Cost (Rs.9 × 30,000 units)	2,70,000
Less: Budgeted Fixed Costs	5,00,000
Less: Proposed Advertising	40,000
Less: Proposed Annual Group Bonus	30,000
Target Cost (Variable Overhead and Direct Labour) for 30,000 units	5,10,000

Let us assume T hour per unit will be required in future to earn target profit of Rs.3,00,000

We know that

Total Direct Labour Cost + Total Variable Overhead Cost = Rs.510000

= 30000 units x T hour Per unit x (Existing Rs.3 per hour + Additional Rs.3 per hour) + 30000 units x T hour Per unit x (Existing Rs.2 per hour) = Rs.510000

= 180000T + 60000T = Rs.510000

= 240000T = Rs.510000

T = 2.125 hour

Hence Target Production Time per unit = 2.125 hour

Present Production Time per unit = 3 hour

Desired reduction in Production Time per unit = 3 hour – 2.125 hour = 0.875 Hour

(ii) Since Company aims to reduce production time per unit by 0.875 hour, Following **Problems** can arise.

1) If Workers work under pressure to produce unit in lesser time then they may ignore optimum utilization of resources e.g. material usage may be excessive than required

2) Pressure to reduce production time may create unwanted pressure on process design & implementation stage.

Above Problems can be sorted out using following **remedial actions**

1) Use of less costly material can help in achieving Target cost

2) Hiring a Good Team Leader may ensure a strong control over design & implementation stage.

3) Workers should be penalized for adverse material usage variance and rewarded for facvourable material usage variance.

(iii) Following are most suitable situations where Target Costing can be adopted.

Following are useful situations in which target costing may be beneficial

1. Companies which are involved in assembly oriented products as opposed to production of repetitive products. Every time product needs new assembly
2. Companies which are involved in diversification of product lines. Diversification means range of new products.
3. Companies which use technologies like factory automation, office automation, computer-aided design & computer-aided manufacturing.
4. Companies which have experience in producing product with short product life

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QUESTION 5.

P & G International Ltd. (PGIL) has developed a new product ' 3 α 'which is about to be launched into the market. Company has spent Rs.30,00,000 on R&D of product ' 3 α '. It has also bought a machine to produce the product ' 3 α ' costing Rs.11,25,000 with a capacity of producing 1,100 units per week. Machine has no residual value. **The company has decided to charge price that will change with the cumulative numbers of units sold:**

Cumulative Sales (units)	Selling Price Rs. per unit
0 to 2,200	750
2,201 to 7,700	600
7,701 to 15,950	525
15,951 to 59,950	450
59,951 and above	300

Based on these selling prices, it is expected that sales demand will be as shown below:

Weeks	Sales Demand per week (units)

1-10	220
11-20	550
21-30	825
31-70	1,100
71-80	880
81-90	660
91-100	440
101-110	220
Thereafter	NIL

Unit variable costs are expected to be as follows:

	Rs. per unit
First 2,200 units	375
Next 13,750 units	300
Next 22,000 units	225
Next 22,000 units	188
Thereafter	225

PGIL uses just-in-time production system. Following is the total contribution statement of the product ' 3 α ' for its Introduction and Growth stage:

	Introduction	**Growth**	
Weeks	1 - 10	11 - 30	
Number of units Produced and Sold	2,200	5,500	8,250
Selling Price per unit (Rs.)	750	600	525
Variable Cost per unit (Rs.)	375	300	300
Contribution per unit (Rs.)	375	300	225
Total Contribution (Rs.)	8,25,000	16,50,000	18,56,250

Required

(i) PREPARE the total contribution statement for each of the remaining two stages of the product's life cycle.
(ii) DISCUSS Pricing Strategy of the product ' 3 α '.
(iii) FIND possible reasons for the changes in cost during the life cycle of the product ' 3 α '. Note: Ignore the time value of money.

ANSWER :-

1. Statement showing total contribution during maturity and decline stage (Rs.)

Particulars	**Maturity**	**Decline**
Weeks	31-70 Weeks	71-110 Weeks
Total units sold	44000 units	(8800+6600+4400+2200) units = 22,000 units
Total Sales (Rs.)	44000 units x Rs.450 = 1,98,00,000	22,000 units x Rs. 30 = 66,00,000

Total VC	= 22000 units x Rs.225 + 22000 units x Rs.188 = 90,86,000	= 22000 units x Rs. 225 = 49,50,000
Total Contribution	10714000	1650000

W. Note 1: Statement showing applicable selling price & variable cost

Weeks	Demand per week	Total Sales Qtty	Cumulative Sales Qtty	SP pu(Rs.)	VC pu (Rs.)
1-10	220	2,200	2,200	750	375
11-20	550	5,500	7,700	600	300
21-30	825	8,250	15,950	525	300
31-70	1,100	44,000	59,950	450	225 upto 22000 units & 188 for next 22000 units
71-80	880	8,800	68,750	300	225
81-90	660	6,600	75,350	300	225
91-100	440	4,400	79,750	300	225
101-110	220	2,200	81,950	300	225

2. Possible reasons for Reduction in variable cost from Rs.375 to Rs.188 are as follows

a) Production at big level (Economies of scale)
b) Learning curve effect if labour intensive method are used
c) Discount on bulk purchase of raw material
d) Reduction in promotional cost

Possible reasons for increase in variable cost from Rs.188 to Rs.225 are as follows

a) Production at small level
b) Unavailability of Discount on bulk purchase of raw material
a) High expenditure on promotional activities

QUESTION 6.

JFE, is following Life Cycle Costing. Its four products P4, P3, P2 and P1 are in the market respectively in Introduction, Growth, Maturity, and Decline stages (phases). The Management wants to analyse the marketing challenges faced by the products to take strategical measures to stabilise the products in the market. For this purpose, the Board directed the Secretary to get a

product-wise report from the marketing chief of each product. The chiefs were asked to give one characteristic possessed by the product because of which the product is being classified in the respective stage and two strategical measures to be taken to overcome the market challenges faced at that stage (phase). The Secretary received the report from all the chiefs and handed them over to the computer operator to get it printed in a tabulated form. But the operator, without understanding the significance of the products, phases, characteristics, and strategies, mixed all the twelve items [(1 + 2) × 4] and got it printed as a list as given below:

(1) Over capacity in the industry.
(2) The company can continue to offer the product to our loyal customers at a reduced price.
(3) Few competitors produce basic version of our product.
(4) Product features may be improved or enhanced to differentiate our product from that of the competitors.
(5) Attracting customers by raising awareness about our product through promotion activities.
(6) High volume of business and increase in competition.
(7) Use the present product as replacement product for launching another new product successfully in the market.
(8) Value-based pricing strategies may be considered.
(9) Profits start declining and at times become negative.
(10) Maintain control over product quality to assure customer satisfaction.
(11) Strengthening or expanding channel and supply chain relationships.
(12) Prices may have to be reduced to attract the price-sensitive customers.

The items are required to be tabulated as in the format given below:

Required

(i) Complete the table given below by entering the twelve items under appropriate category columns. You need not rewrite the items. Write the serial numbers of the items only in columns (3) and (4).

Products (1)	Phases (Stages) (2)	Characteristics (3)	Strategies (4)
P4	Introduction		
P3	Growth		
P2	Maturity		
P1	Decline		

(ii) List down the importance (any four) of Product Life Cycle Costing.

(iii) State the benefits (any four) of Product Life-Cycle Costing.

ANSWER :-

(i) Statement Showing Product Life Cycle Characteristics and Strategies

Products (1)	Phases (Stages) (2)	Characteristics (3)	Strategies (4)
P_4	Introduction	(3)	(5), (11)
P_3	Growth	(6)	(10), (8)
P_2	Maturity	(1)	(4), (12)
P_1	Decline	(9)	(2), (7)

(ii) Importance of Product Life Cycle (PLC) Costing

- As a Planning tool, it characterizes the marketing challenges in each stage and poses major alternative strategies, i.e. application of Kaizen.
- As a Control tool, the PLC concept allows the company to measure product performance against similar products launched in the past.
- As a Forecasting tool, it is very important because sales histories exhibit diverse patterns and the stages vary in duration.
- It leads to appropriate strategy formulation depending on the stages of the product life cycle.

(iii) Benefits of Product Life Cycle Costing

The benefits of product life cycle costing are summarized as follows:

- The product life cycle costing results in earlier actions to generate revenue or to lower costs than otherwise might be considered. There are a number of factors that need to the managed in order to maximize return on a product.
- Better decisions should follow from a more accurate and realistic assessment of revenues and costs, at least within a particular life cycle stage.
- Product life cycle thinking can promote long-term rewarding in contrast to shortterm profitability rewarding.
- It provides an overall framework for considering total incremental costs over the entire life span of a product, which in turn facilitates analysis of parts of the whole where cost effectiveness might be improved.
- It is an approach used to provide a long-term picture of product line profitability, feedback on the effectiveness of life cycle planning and cost data to clarify the economic impact of alternatives chosen in the design, engineering phase etc.
- It is also considered as a way to enhance the control of manufacturing costs. The thrust of product life cycle costing is on the distribution of costs among categories changes over the life of the product, as does the potential profitability of a product. Hence it is important to track and measure costs during each stage of a product's life cycle.
- Product life cycle costing traces research and design and development costs etc., incurred to individual products over their entire life cycles, so that the total magnitude of these costs for each individual product can be reported and compared with product revenues generated in later periods.

QUESTION 7.

A fertilizer company produces Grade A and Grade B fertilizers. One kilogram of Grade A fertilizer sells for Rs.280 per kilogram and one kilogram of Grade B fertilizer sells for Rs.400 per kilogram.

The products pass through three cost centers CC1, CC2 and CC3 during the manufacturing process. Total direct material cost per kilogram of fertilizer produced is Rs.300 and direct labor cost per kilogram of fertilizer produced is Rs.200. Allocation between the cost centres is given below:

Particulars	CC1	CC2	CC3	Total
Cost of Direct Material (per kg of fertilizer produced)	Rs.90	Rs.120	Rs.90	Rs.300
Cost of Direct Labour (per kg of fertilizer produced)	Rs.60	Rs.80	Rs.60	Rs.200
Cost Allocation to Grade A	30%	50%	30%	
Cost Allocation to Grade B	70%	50%	70%	

All of expenses (considered to be overheads) per kilogram of fertilizer produced is Rs.150. This is allocated equally between Grade A and Grade B fertilizer. Pricing decisions for the fertilizers is made based on the above cost allocation.
The management accountant of the company has recently come across the concept of environmental management accounting. Pricing of products should also factor in the environmental cost generated by each product. An analysis of the overhead expenses revealed that the total cost of Rs.150 per kilogram of fertilizer produced, includes incinerator costs of Rs.90 per kilogram of fertilizer produced. The incinerator is used to dispose the solid waste produced during the manufacturing process. Below is the cost center and product wise information of solid waste produced:

Waste produced (in tonnes per annum)	CC1	CC2	CC3	Total
Grade A	2	3	1	6
Grade B	2	2	5	9

Based in the impact that each product has on the environment, the management would like to revise the cost allocation to products based taking into account the incinerator cost that each product generates. The remaining overhead expenses of Rs.60 per kilogram of fertilizer produced can be allocated equally.

Required

(i) CALCULATE product wise profitability based on the original cost allocation. RECALCULATE the product wise profitability based on activity based costing methodology (environmental management accounting).
(ii) ANALYZE difference in product profitability as per both the methods.
(iii) RECOMMEND key takeaways for the company to undertake the above analysis of overhead costs and pricing as per environmental management accounting.

ANSWER :-

(i) Product Wise Profitability as per Original Allocation Methodology
(Figures in Rs. per kilogram of fertilizer produced)

Particulars	Grade A	Grade B	Total
Selling Price	280	400	680
Direct Material (Refer Table 1)	114	186	300
Direct Labour (Refer Table 1)	76	124	200
Overheads (allocated equally)	75	75	150
Total Expenses	265	385	650
Profit	15	15	30
Profitability	5.36%	3.75%	×

Table 1 Allocation of Direct Materials and Labour as per Cost Centre and Product

Particulars	CC1			CC2			CC3			Total for the company		
	A	B	CC Total	A	B	CC Total	A	B	CC Total	Gr. A	Gr. B	Grand Total
Direct Material	27	63	90	60	60	120	27	63	90	114	186	300
Direct Labour	18	42	60	40	40	80	18	42	60	76	124	200

Product Wise Profitability (activity based costing using environmental management accounting) requires the following steps:

1. Overhead expenses of Rs. 150 per kilogram of fertilizer produced be first bifurcated into incinerator costs and other overhead costs.
2. Incinerator costs of Rs. 90 per kilogram of fertilizer needs to be allocated first to the cost centres. This is done based on the waste generated at each cost centre. The individual cost allocated to each cost centre is again allocated to products based on the waste generated at each cost centre by each product. Refer part a of table 2 for detailed calculations.
3. As mentioned in the problem, other overhead costs are allocated to each product at each cost centre level equally. Refer part b of table 2 for detailed calculations.
4. The above allocations to each product at a cost centre level is then summed up to get the product wise overhead cost allocation. Refer part c of table 2 for detailed calculations.

Accordingly, the Revised Product Profitability would be as follows:
(Figures in Rs. per kilogram of fertilizer produced)

Particulars	Grade A	Grade B	Total
Selling Price	280	400	680
Less: Direct Material (refer table 1)	114	186	300
Less: Direct Labour (refer table 1)	76	124	200
Less: Overheads (refer table 2)	66	84	150
Profit	24	6	30
Profitability	8.57%	1.50%	×

Table 2 Allocation of Overhead Expenses to each Cost Centre and Product
(Figures in Rs. per kilogram of fertilizer produced)

Product Waste Produced (in tonnes per annum)	CC1	CC2	CC3	TOTAL
Grade A	2	3	1	6
Grade B	2	2	5	9
Total Waste (in tonnes)	4	5	6	15
Incinerator Cost Allocated to Cost Centres (based on waste generated)	24	30	36	90
Other Overhead Expenses	20	20	20	60
Total Cost Centre Wise Overhead Cost	44	50	56	150

Part A: Allocation of Incinerator Cost from Cost Centre to each product (based on waste produced at each cost centre by each product)				
Product	**CC1**	**CC2**	**CC3**	**Total**
Grade A	12	18	6	36
Grade B	12	12	30	54
Total Incinerator Cost	24	30	36	90
Part B: Allocation of Other Overhead Cost from Cost Centre to each product				
Product	CC1	CC2	CC3	Total
Grade A	10	10	10	30
Grade B	10	10	10	30
Total Other Overhead Cost	20	20	20	60
Part C: Total Overhead Cost (Cost Centre and Product Wise i.e. part a + b)				
Product	CC1	CC2	CC3	Total
Grade A	22	28	16	66
Grade B	22	22	40	84
Total Overhead Cost	44	50	56	150

Summarizing Product Profitability as per both methods:

Product	**(Profit in Rs. per kg of fertilizer produced)**		**Profit %**	
	Original Method	**ABC (as per EMA) Method**	**Original Method**	**ABC (as per EMA) Method**
Grade A	15	24	5.36%	8.57%
Grade B	15	6	3.75%	1.50%

(ii) As summarized above, originally the profit generated from Grade A and Grade B products, was Rs.15 per kilogram. Grade A was the more profitable product giving return of 5.36% compared to Grade B's return of 3.75%. This has been calculated by allocating overheads equally to Grade A and B.
During the year, 15 tons of waste is produced during the manufacturing process. Grade B fertilizer produces more waste that accounts for 60% of the waste. Therefore, Grade B should bear higher amount of the incinerator cost compared to Grade A. Allocation based on this premise, dramatically changes the profitability of the products. As calculated above, Grade A fertilizer, due to lower incinerator cost allocation, generates a profit of Rs.24 per kilogram of fertilizer. Grade B's profits accordingly are lower, since the product generates more waste and has to bear a larger share of clean-up expenses. Profitability of Grade A increases to 8.57% while Grade B falls dramatically to 1.50%.

(iii) The company can draw a number of conclusions from this analysis of overhead costs as per environmental management accounting. This analysis has helped the company reach the conclusion that Grade B fertilizer produces more waste. The company could adopt either of the following approaches:

(a) To maintain the same level of profitability, the company can increase the price of Grade B by another Rs.9 per kilogram. This is a 2.25% increase in the sale price of Grade B fertilizer. Depending on the market for this grade of fertilizer, the company has to decide whether to increase the price of the product. While a price increase may be possible if the company has a strong market hold, it might be difficult if competition in the market is high. or

(b) The other approach, a more sustainable approach that is the aim of environmental management accounting, would be to reduce the waste produced in the manufacturing process. This analysis, has quantified the waste generated in the process. Better manufacturing techniques, could save the company incinerator costs, that would yield better profits for the company.

QUESTION 8.

Golden Pacific Airlines Ltd. operates its services under the brand 'Golden Pacific'. The 'Golden Pacific' route network spans prominent business metropolis as well as key leisure destinations across the Indian subcontinent. 'Golden Pacific', a low-fare carrier launched with the objective of commoditizing air travel, offers airline seats at marginal premium to train fares across India.

Profits of the 'Golden Pacific' have been decreasing for several years. In an effort to improve the company's performance, consideration is being given to dropping several flights that appear to be unprofitable.

Income statement for one such flight from 'New Delhi' to 'Leh' (GP - 022) is given below (per flight):

	Rs.	Rs.
Ticket Revenue (175 seats x 60% Occupancy x Rs. 7,000 ticket price)		7,35,000
Less: Variable Expenses (Rs.1,400 per person)		1,47,000
Contribution Margin		5,88,000
Less: Flight Expenses:		
Salaries, Flight Crew	1,70,000	
Salaries, Flight Assistants	31,500	
Baggage Loading and Flight Preparation	63,000	
Overnight Costs for Flight Crew and Assistants at destination	12,600	
Fuel for Aircraft	2,38,000	
Depreciation on Aircraft	49,000*	
Liability Insurance	1,47,000	
Flight Promotion	28,000	
Hanger Parking Fee for Aircraft at destination	7,000	7,46,100
Net Gain / (Loss)		(1,58,100) *

Based on obsolescence

The following additional information is available about flight GP-022.

1. Members of the flight crew are paid fixed annual salaries, whereas the flight assistants are paid by the flight.
2. The baggage loading and flight preparation expense is an allocation of ground crew's salaries and depreciation of ground equipment.

3. One third of the liability insurance is a special charge assessed against flight GP-022 because in the opinion of insurance company, the destination of the flight is in a "high - risk" area.
4. The hanger parking fee is a standard fee charged for aircraft at all airports.
5. If flight GP-022 is dropped, 'Golden Pacific' Airlines has no authorization at present to replace it with another flight.

Required
Using the data available, prepare an ANALYSIS showing what impact dropping flight GP-022 would have on the airline's profit.

ANSWER :-

As per the statement given in the problem, FlightGP-022 incurs a net (loss) of Rs.158,100. This is the net result of revenue less costs. Revenue is entirely variable since it depends upon passenger occupancy. Costs are both variable and fixed nature.

To analyze the impact of dropping flight GP-022, we need to re-compute net gain/ (loss) that Golden Pacific earns when it operates the flight based on relevant costing principles.

Net benefit / (Loss) = Sales – Variable Cost

	Rs.	Rs.	Nature
Ticket Revenue (175 seats x 60% Occupancy x Rs. 7,000 ticket price)		7,35,000	
Less: Variable Expenses (Rs.1,400 per person)		1,47,000	**Variable**
Contribution Margin		5,88,000	
Less: Flight Expenses:			
Salaries, Flight Crew	1,70,000		Fixed
Salaries, Flight Assistants	31,500		**Variable**
Baggage Loading and Flight Preparation	63,000		Fixed
Overnight Costs for Flight Crew and Assistants at destination	12,600		**Variable**
Fuel for Aircraft	2,38,000		**Variable**
Depreciation on Aircraft	49,000*		Fixed
Liability Insurance	1,47,000		**1/3rd Variable**
Flight Promotion	28,000		**Variable**
Hanger Parking Fee for Aircraft at destination	7,000	7,46,100	Fixed

Net Gain / (Loss)		(1,58,100)	

Statement Showing Net Gain/ (Loss)

	Rs.
Sales if flight is continued	7,35,000
Less Relevant Variable Cost	
Variable Exp.	(147000)
Salaries, Flight Assistants	(31,500)
Overnight Costs for Flight Crew and Assistants	(12,600)
Fuel for Aircraft	(2,38,000)
Liability Insurance (1/3 × Rs.1,47,000)	(49,000)
Flight Promotion	(28,000)
Net Benefit	228900

The statement showing loss in operations of Rs.158,100 is misleading for decision making purpose because it accounts for costs that are fixed and irrelevant. However, since flight GP-022 yields a net gain of Rs.2,28,900, flight operations should continue.

QUESTION 9.

About Aditya Group

Aditya Group was established in 1975, manufactures and sells electronic personal grooming and beauty products. The group has two 100% subsidiaries AUS Ltd. and ANZ Ltd. AUS Ltd. manufactures luxury products that cater to niche customers who prefer specialized personal grooming and beauty care. ANZ Ltd. caters to regular daily beauty and grooming requirements that has a wide reach within the market. Factories of both companies are located within India. The products are sold to wholesalers, who supply these products to the retail market.

Aditya Group purchases its raw material requirements from both domestic and overseas markets. Additionally, certain products manufactured by AUS Ltd. can be enhanced based on the products manufactured by ANZ Ltd. Therefore, as per production requirements, AUS Ltd. sources some product components from ANZ Ltd.

Aditya Group has a centralized decision making set-up. Basic policy decisions for functions such as production planning, sales and client relationship, finance and human resources are handled at the group level. Individual units AUS Ltd. and ANZ Ltd. concentrate on the manufacturing alone.

About You

You are an Assistant Manager in Finance and Accounts department of Aditya Group, headed by Director- Finance Ms. Elsea. You assist and report to Ms. Fiona, Manager of yourdepartment. Sometime you also assist Director Finance in analysing financial and non - financial information, drafting reports for board meetings, preparation of presentation and staff trainings.

Business Situation- 1

Yesterday, 5.15 P.M.

You got an email from Ms. Elsea, with Cc to Ms. Fiona. Ms. Elsea, asked you to prepare a cost statement for making a quotation to a new customer. She has also informed you that the customer can also maintain a long- term business relation with us. You have been requested to gather information related to the specification from Sales Manager.

Yesterday, 5.25 P.M.
You have been called by Ms. Fiona, and provided the product specification received from Sales- Manager for which quotation has to be quoted. Ms. Fiona has also requested you to gather relevant information to prepare cost statement. Due to the expected long term business relationship that AUS Ltd. wants to have with the customer, the sales manager wants to quote the lowest possible price. AUS Ltd. currently has some spare capacity that can be utilized to cater to this entire order. Therefore, only the relevant cost to AUS Ltd. has to be considered to arrive at the quote.
After meeting with your reporting officer, you mailed to various concerned department and requested for data.
The following information has been obtained in relation to the contract:

Today, 10.05 A.M.
You got an e-mail from Production Manager, it has been informed that 40 tonnes of material Dx would be required. This material is in regular use by AUS and has a current purchase price of Rs.380 per tonne. Currently, there are 5 tonnes in inventory which cost Rs.350 per tonne. The resale value of the material in inventory is Rs.240 per tonne.
Further, with regards to components, it has been informed that 4,000 components would be required. These could be bought externally for Rs.15 each or alternatively they could be supplied by ANZ Ltd. The variable cost of the component if it were manufactured by ANZ Ltd. would be Rs.8 per unit. ANZ Ltd. has sufficient capacity to produce 2,500 components without affecting its ability to satisfy its own external customers. However, in order to make the extra 1,500 components required by AUS Ltd., ANZ Ltd. would have to forgo other external sales of Rs.50,000 which have a contribution to sales ratio of 40%. To have uniformity in the quality of the component, it is assumed that AUS Ltd. would procure its entire requirement of 4,000 components either externally or from ANZ Ltd. The transfer pricing policy of Aditya Group for sales between units aims at goal congruence. The unit selling the goods would be allowed to charge any opportunity cost on account of catering to internal demand, while the purchasing unit should ensure that the company is not at a loss.

Today, 10.45 A.M.
You got an e-mail from Personnel Manager, it has been informed that 2,000 high skilled labour hours would be required. The grade of labour required is currently paid Rs.5 per hour. Highly skilled labour is in short supply and cannot be increased significantly in the short-term. This labour is presently engaged in meeting the, demand for product 'G', which requires 4 hours of highly skilled labour. The contribution from the sale of one unit of product L is Rs.24.
It has also been informed that the contract would require a specialist machine. The machine could be hired for Rs.15,000 or it could be bought for Rs.50,000. At the end of the contract if the machine were bought, it could be sold for Rs.30,000. Alternatively, it could be modified at a cost of Rs.5,000 and then used on other contracts instead of buying another essential machine that would cost Rs.45,000. The operating costs of the machine are payable by AUS whether it hires or buys the machine. These costs would total Rs.12,000 in respect of the new contract.

Supervisor
The contract would be supervised by an existing manager who is paid an annual salary of Rs.50,000 and has sufficient capacity to carry out this supervision. The manager would receive a bonus of Rs.5,000 for the additional work.

Development Time
15 hours of development time at a cost of Rs.30,000 have already been worked in determining the resource requirements of the contract.

Fixed Overhead Absorption Rate
AUS uses an absorption rate of Rs.20 per direct labour hour to recover its general fixed overhead costs. This includes Rs.5 per hour for depreciation.

Today, 11.15 A.M: Ms. Fiona called you in her place as asked you the following:

Required

(i) CALCULATE the relevant cost of the contract to AUS. You must present your answer in a schedule that clearly shows the relevant cost value for each of the items identified above. You should also EXPLAIN each relevant cost value you have included in your schedule and why any values you have excluded are not relevant. Ignore taxation and the time value of money.

(ii) DISCUSS two problems that can arise as a result of setting prices using relevant costing.

Business Situation- 2

Today, 5.26 P.M: A memo from Managing Director of the group has been circulated to all officers of the group which stated "My objective for the forthcoming year is to reduce our quality costs in each of the primary activities in our value chain". The company is keen to build a reputation for quality and gives a five-year guarantee with all of its products.

Today, 5.37 P.M: Ms. Fiona, called you in her place and asked the following:

Required

(iii) EXPLAIN, by giving examples, how each of the four types of quality cost could be reduced. You should also IDENTIFY in which primary activity each one of your examples would occur in Aditya Group's value chain.

ANSWER :-

(i) Statement Showing Relevant Cost

Type of Cost	Explanation	Amount (Rs.)
Material Dx (40 tonnes × Rs.380)	1	15,200
Components	2	52,000
Direct labour (2,000 hrs. × Rs.11)	3	22,000
Specialist machine	4	10,000
Machine operating cost	5	12,000
Supervision	6	5,000
Development time	7	Nil
General fixed overhead	8	Nil
Total relevant cost		1,16,200

Explanation

1. Company never disturb stock of material which is in regular use hence we shall buy required material from market hence purchase cost of material shall be relevant cost = 40 Tonnes x Rs.380 per tonne = Rs.15,200
2. Company have 2 options to acquire components

   Option 1:- Buy it from market:- Relevant cost = 4000 units x Rs.15 = Rs.60,000

   Option 2:- Obtain internally:- Relevant cost = 2500 units x Rs.8 + 1500 units x Rs.8 + Rs.50000x40%(Opp. Cost) = Rs.52,000

   Company shall choose lowest cost option hence Rel. cost shall be Rs.52000

1. Labour is in short supply hence we need to divert from regular production hence relevant labour cost shall be payment to labour plus opp. Cost

   Rel. cost = 2000 hours x Rs.5 + Rs.24 per unit / 4 hour per unit x 2000 hour = Rs.22,000
2. Company has 3 option w.r.t. machine

   Option 1:- Hire Machine - Rel. cost = Rs.15000

   Option 2:- Purchase & Sale as scrap – Rel. Cost = Rs.50000 – Rs.30000 = Rs.20000

   Option 3:- Purchase & Use for other contract also – Rs.50000 + Rs.5000 – Rs.45000 (Benefit since machine would not required to be purchased) = Rs.10000

   Company shall choose lowest cost option
3. Machine operating cost of Rs.12000 is relevant cost since has to incur
4. Annual salary to supervisor is not relevant cost but bonus of Rs.5000 shall be relevant cost
5. Development cost is already incurred hence sunk cost therefore not relevant for offer
6. Recovery of general fixed overhead is always sunk cost.

(ii) Two main issues arise when pricing work based on relevant costs:

- Profit reporting Issue:- Since pricing is based on estimated relevant cost and there are chances that actual cost may be higher than cost estimated. In such case company may need to bear loss. Hence manager may find it difficult to reply the reasons on "why there is loss"
- Pricing of future work:- since pricing is based on estimated relevant cost and it is purely dependent upon spare capacity available with company right now but in future it may not be possible for company charge same amount for same quantity of work. So this may

customer feel that their loyalty is being penalized.

(iii) Prevention

Operations: Preventative maintenance and checking of the calibration of machinery. This would reduce the number of potentially faulty products being produced and therefore reduce guarantee claims.

Appraisal

Inbound Logistics: Reduce costs of incoming inspections by building close links with suppliers and getting them to adopt TQM. If suppliers can guarantee their quality, the n inbound inspections could be eliminated.

Internal Failure

Operations: Reduce costs of re-works by training employees on a continual basis e.g. quality circles. This would reduce failure costs and also improve quality.

External Failure

Service: Design quality into the product to try to prevent guarantee claims and therefore the cost of servicing/repairing the product.

QUESTION 10.

Baithway India Ltd. (BIL) is an ISO 9001:2008, a premier multi-discipline company. BIL manufactures a diverse range of products viz. Pressure Vessels, Wagons, Steel Castings etc. To manufacture Wagons, BIL undertake structural fabrication jobs and manufacturing, retrofitting of EOT crane. It is presently the flagship company of the Baithway Group comprising of renowned companies such as Krishna Agriculture, Chiang Phosphate etc. The Group was launched with the idea of one virtual company with diversified businesses, and is based on four fundamental principles - Collaboration, Sustainability, Inclusiveness and being Global.

Baithway India Ltd. has two Divisions namely, Bogie Division (BD) and Wagon Division (WD) for manufacturing of Wagon. 'BD' manufactures Bogies and 'WD' manufactures various type of Wagons like Freight Wagon, Tank Wagon, Special Wagon etc. To manufacture a Wagon, 'WD' needs 4 Bogies. 'BD' is the only manufacturer of the Bogies and supplies both 'WD' and outside customers. Details of 'BD' and 'WD' for the coming financial year 2018-19 are as follows:

	BD	**WD**
Fixed Costs (Rs.)	9,20,20,000	16,45,36,000
Variable Cost per unit (Rs.)	2,20,000	4,80,000*
Capacity per month (units)	320	12

* excluding transfer costs

Market research has indicated that the demands in the market for Baithway India Ltd.'s products at different quotations are as follows

For Bogies: Quotation price of Rs.3,20,000 no tender will be awarded, but demand will increase by 30 Bogies with every Rs.10,000 reduction in the unit quotation price below Rs.3,20,000.

For Wagons: Quotation price of Rs.17,10,000 no tender will be awarded, but the demand for Wagons will be increased by 2 Wagons with every Rs.50,000 reduction in the unit quotation price below Rs.17,10,000.

Further, 'BD' is the only manufacturer of Bogies but due to increased demand, competitors are entering the market. The division is reviewing its pricing policy and carrying out some market research. After the market research, the division 'BD' has decided to introduce new type of "E" Class Bogies in the market and to obtain the patent right for such unique Bogies. High growth in future characterizes this Class.

Required

(i) CALCULATE the unit quotation price of the Wagon that will maximise Baithway India Ltd.'s profit for the financial year 2018-19.

(ii) CALCULATE the unit quotation price of the Wagon that is likely to emerge if the divisional managers of 'BD' and 'WD' both set quotation prices calculated to maximise divisional profit from sales to outside customers and the transfer price is set at market selling (quotation) price.
[Note: If P = a – bQ then MR = a – 2bQ]

(iii) RECOMMEND appropriate pricing strategy while introducing the "E" Class Bogies.

ANSWER :-

(i) Assumed Quotation Price 'P', Quantity 'Q'

The Marginal Cost of a 'Wagon' is Rs.13,60,000
(Rs.2,20,000 × 4 Bogies + Rs.4,80,000)

Demand Function for a 'Wagon'

P	= Rs.17,10,000 – (Rs.50,000 / 2) × Q
Revenue (R)	= Q × [17,10,000 – 25,000 × Q]
	= 17,10,000 Q – 25,000 Q2
Marginal Revenue (MR)	= 17,10,000 – 50,000 Q
Marginal Cost (MC)	= 13,60,000

Profit is Maximum where Marginal Revenue (MR) equals to Marginal Cost (MC)

17,10,000 – 50,000 Q	= 13,60,000
Q	= 7.00 units

By putting the value of 'Q' in Demand Function, value of 'P' is obtained.

P	= 17,10,000 – (50,000/ 2) × Q
	= 17,10,000 – 25,000 × 7.00
	= Rs.15,35,000

At Rs.15,35,000 unit Quotation Price of a Wagon, the Baithway Company Ltd.'s Profit will be Maximum.

(ii) At 'BD' the Divisional Manager would ensure that Divisional Marginal Revenue should be equal to Division's Marginal Cost so that Profit can be Maximum.

MR of a Bogies	=	MC of Manufacturing a Bogies
3,20,000 – 2(10,000/ 30) × Q	=	2,20,000
Q	=	150 units

Selling Price of a Bogie i.e 'P' is

P	=	3,20,000 – (10,000/ 30) × 150
	=	Rs.2,70,000

'BD' will earn Maximum Profit when it will Quote Rs.2,70,000 to the Outside Market. Since, Outside Market Quotation is Transfer Price as well, so Transfer Price to WD will be Rs.2,70,000 and it forms part of WD's Marginal Cost.
At 'WD', Division Manager would ensure that Divisional Marginal Revenue should be **equal to** Division's Marginal Cost so that Profit can be Maximum.

MR of a Wagon	=	MC of Manufacturing a Wagon
17,10,000 – 50,000 × Q	=	(2,70,000 × 4 Bogies) + Rs.4,80,000
Q	=	3.00 units

Quotation Price of a Wagon 'P' should be:

P	=	Rs.17,10,000 – 25,000 × 3.00
	=	Rs.16,35,000

The unit Quotation Price of Wagon that emerges as a result of Market Based Transfer Pricing is Rs.16,35,000.

(iii) Whenever a new product is launched into the market, management can adopt either Skimming or Penetration strategy.

The idea behind Skimming Strategy is to intentionally keep a price high to recover the high R&D and marketing expenses associated with developing a new product. For Price Skimming to work, the product must be perceived as having unique advantage over its competing products, very difficult to copy or protected by patents.
Division 'BD' may follow Skimming Strategy by taking advantage of the distinctive features of Bogie "E". High prices in the early stages of a Bogies' life cycle are expected to generate high initial cash flows, this will help the division to recover the high development costs it would incur. Further, this new Bogie "E" is protected from competition through entry barrier. Such barrier is patent.
With Penetration Strategy, a low price is initially charged for the product rather than high prices. The idea behind this is that the price will make the product accessible to many buyers and therefore the high sales will compensate for the lower prices being charged. This penetration pricing is adopted for rapid market acceptance, maximum sales and discouraging competition from the market, however this strategy is not for all companies since it requires a cost structure and scale economics that remain unaffected by narrow profits margin.

The circumstances which may favor a penetration pricing policy are:

– Highly elastic demand for the product, i.e. the lower the price, the higher the demand. This situation is not mentioned in this case for Bogies "E".
– If significant economies of scale could be achieved so that higher sales volumes would result in reductions in costs. However, in this case, it cannot be ascertained.
– Where entry barriers are low, however in this case, new competitors cannot enter the market as Bogies "E" is protected by patent.
– If company desires to shorten the initial period of the product's life-cycle to enter the growth and maturity stages quickly, however, there is no evidence the division 'BD' wish to do this.

Overall, Due to the uniqueness, heavy R&D cost, and barrier to entry for competitor, a market skimming pricing strategy is appeared to be the more appropriate pricing strategy for Bogie "E".

QUESTION 11.

You are a paid assistant working in SBC LLP – an accounts consultancy firm. You have received the following email from one of SBC's senior partner:

To: DG
From: SB

Date: 22/06/20XX
Subject: PEL meeting this afternoon
As you are probably aware, we are meeting with the managers of PEL later this afternoon to discuss several key issues, and I need you to do some research for me. I need a report that covers the following:
Analysis of the new proposal for the period 2017 to 2019 based on
- external effectiveness and
- internal efficiency
To help you with this, I've attached a copy of our forecast of PEL's financial and non-financial data for the period 2017 to 2019. Please read it carefully and email me back as soon as possible so I have time to prepare before the meeting.
Thanks
SB

----------Attachment----------

Background to PEL
Precision Engineering Ltd (PEL) specialises in engineering design and manufacture in the automotive and motorsport industry. PEL's design team has many years' experience in the design and development of engine components for the market and high performance engines. PEL has identified a number of key competitors and intends to emphasis on close co-operation with its customers in providing products to meet their specific engineering design and quality requirements. Efforts will be made to improve the effectiveness of all aspects of the cycle, from product design to after-sales service to customers. This will require data from a number of departments in the achievement of the specific goals of the new proposal. Efforts will be made to improve productivity in conjunction with increased flexibility of methods.

Forecast of PEL's Financial and Non-Financial Data

Particulars	2017	2018	2019
Total Market Size (RS.lacs)	110	115	120
PEL Sales (RS.lacs)	18	21	23
PEL Total Costs (RS.lacs)	14.10	12.72	12.55
Production Achieving Design Quality Standards	95.5%	98.0%	98.5%
Returns from Customers (% of Deliveries)	2.0%	1.0%	0.5%
Cost of After-Sales Service (RS.lacs)	1.3	1.1	1.0
Sales Meeting Planned Delivery Dates	85%	90%	95%
Average Cycle Time (Customer Enquiry to Delivery) (weeks)	5.0	4.5	4.0
Components Scrapped in Production (%)	6.5%	4.0%	1.5%
Idle Machine Capacity (%)	9%	5%	1%

Required
Draft the email as requested by the partner.

SOLUTION :-

To: SB

From: DG

Date: 22/06/20XX

Subject: Re: PEL Meeting this afternoon

Please find below my analysis of the points you wished me to examine for PEL. Please let me know

if you wish to discuss any of these points in more detail.

Kind regards

DG

External Effectiveness- The marketing success of the proposal is associated with the achievement of customer satisfaction. The success will need an efficient business operating system for all aspects of the cycle from product design to after-sales service to customers. Customer satisfaction is linked with Improved quality and delivery.

Quantitative measures of these factors are as follows:

- Quality is expected to improve. The percentage of production achieving design quality standards is expected to increase from 95.5% to 98.5% between 2017 and 2019. In the same period, returns from customers for replacement or rectification should drop from 2% to 0.5% and the cost of after-sales service should drop from Rs.1.3lacs to Rs.1.0lacs.
- Delivery efficiency improvement that is expected may be measured in terms of the rise in the percentage of goods achieving the planned delivery date. This percentage rises from 85% in 2017 to 95% in 2019.

Internal Efficiency- The financial success of the proposal is linked to the achievement of high productivity. This should be helped through reduced cycle time and decreased levels of waste. Quantitative measures of these factors are as follows:

- The average total cycle time from customer enquiry to delivery should drop from 5 weeks in 2017 to 4 weeks in 2019.
- Waste in the form of idle machine capacity is expected to drop from 9% to 1% between 2017 and 2019. Also, component production scrap is expected to drop from 6.5% in 2017 to 1.5% in 2019.

QUESTION 12.

BYD Alloy Ltd. first opened its door in 1990 for business and now it is a major supplier of metals supporting over a dozen different industries and employs experts to support each industry. These include Wood & Panel Products Manufacturing, Hearth Products , Site Furnishings, Commercial and Residential Construction etc. It has grown through devotion to its customers, dedication to customer service and commitment to quality products. The company has two divisions: Division 'Y' and Division 'D'. Each division work as an investment centre separately. Salary of each divisional manager is RS.720,000 per annum with

the addition of an annual performance related bonus based on divisional return on investment (ROI). A minimum ROI of 12% p.a. is expected to be achieved by each divisional manager. If a manager only achieves the 12% target, he will not be rewarded a bonus. However, for every whole 1% point above 12% which the division achieves for the year, a bonus equal to 3% of annual salary will be paid subject to a maximum bonus of 20% of annual salary. The figures belonging to the year ended 31 March 2019 are given below:

	Division 'Y' ('000)	**Division 'D' ('000)**
Revenue	29,000	17,400
Profit	5,290	3,940
Less: Head Office Cost	(2,530)	(1,368)
Net Profit	2,760	2,572
Non- Current Assets	19,520	29,960
Cash, Inventory, and Trade Receivable	4,960	6,520
Trade Payable	5,920	2,800
Manager Responsible	HAI	FAI

During the financial year 2018-19, FAI manager of Division 'D' invested RS.13.6 million in new equipment including an advanced cutting machine, which will increase productivity by 10% per annum. HAI, manager of Division 'Y', has made no investment during the year, even its computer system needs updation. Division 'Y''s manager has already delayed payments of its suppliers due to limited cash & bank balance although the cash balance at Division 'Y' is still better than that of Division 'D'.

Required

(i) For each division, COMPUTE, ROI for the year ending 31 March 2019. Justify the figures used in your calculation.
(ii) COMPUTE bonus of each manager for the year ended 31 March 2019.
(iii) DISCUSS whether ROI provides justifiable basis for computing the bonuses of managers and the problems arising from its use at BYD for the year ended 31 March 2019.

ANSWER :-

(i) ROI

Division 'Y'

Controllable Profit = RS.5,290K
Net Assets = RS.19,520k + RS.4,960K – RS.5,920K = RS.18,560K
ROI = 28.5%

Division 'D'

Controllable profit = RS.3,940K
Net Assets = RS.29,960K + RS.6,520K – RS.2,800K = RS.33,680K
ROI = 11.7%

In computation of ROI of both division, controllable profit has been taken into consideration. The reason behind this is that the Head Office costs are not controllable and responsibility accounting considers that managers should only be held responsible for costs over which they have control. The assets figures being used also depend on the same principal. Figures of current assets and the current liabilities have been taken into consideration as they are such items over which managers have complete control.

(ii) Bonus Bonus to be paid for each percentage point = RS.7,20,000 × 3% = RS.21,600
Maximum Bonus = RS.7,20,000 × 20% = RS.1,44,000

Division 'Y'
ROI = 28.5% (16 whole percentage points above minimum ROI)
16 × RS.21,600 = RS.3,45,600
Therefore, manager will be paid the bonus of RS.1,44,000 (max.)

Division 'D'
ROI = 11.7% (Zero, percentage point above minimum)
Therefore Bonus = NIL

(iii) Discussion

FAI will not receive any bonus since he has not earned any point above minimum percentage. This is due to the large asset base on which the ROI figure has been computed. Total assets of Division 'D' are almost double the total assets of Division 'Y'. The major reason behind this is that Division 'D' invested RS.13.6 million in new equipment during the year. If this investment were not made, net assets would have been only RS.20.08 million and the ROI for Division 'D' would have been 19.62% resulting in payment of a bonus RS.1,44,000 (7 × RS.21, 600 = RS.1,51,200; subject to maximum of RS.1,44,000) rather than the nothing. FAI is being penalized for making decisions which are in the best interests of his division. It is very surprising that he decided to invest where he knew that he would receive lesser bonus subsequently. He acted in the best interests of the BYD altogether. On the other hand, HAI has taken benefit from the fact that he has not invested anything even though it was needed for computer system updation. This is an example of sub-optimal decision making.

Further, Division 'Y''s trade payables are over double those of Division 'D'. In part, one would expect this due to higher sales (almost 66% more than Division 'D') and low cash levels at Division 'Y'. Higher trade payable leads to reduction in net assets figures. The fact that BYD is rewarding HAI with bonus, even though relationships with suppliers may be badly affected, is again a case of sub-optimal decision making.
If the profit margin (excluding head office cost) as percentage of sales is calculated, it comes to 18.24% for Division 'Y' and 22.64% for Division 'D'. Therefore it can be seen that Division 'D' is performing better if capital employed is ignored. ROI is simply making the division 'D''s performance worse.

FAI might feel extremely disappointed by getting nothing and in the future, he may opt to postpone the investment to increase the bonus. Non- investing in new technology and equipment will mean that the BYD will not be kept updated with industry changes and its overall future competitiveness will be affected.

Briefly, the use of ROI is resulting in sub-optimal decision making and a lack of goal congruence i.e. what is good for the managers is not good for the company and vice versa. Fortunately, Division 'D''s manager still seems to be acting for the benefit of the BYD but the other manager is not. The fact that one manager is receiving a much bigger bonus than the other is not justifiable here and may result in conflict in long run. This i s disappointing for the company especially in the situation when the divisions need to work in unison.

QUESTION 13.

Water Utilities Services (WUS) is a parastatal company established with an aim for supply and distribution of water in Mumbai as well as supply of water to the various local authorities for distribution to villages and other small cities adjacent to Mumbai. This involved planning, operating, treating, maintaining, and distributing water resources in the country's urban centres and other areas mandated by Maharashtra Government. Its mission is "To provide sustainable water in a cost effective and environmentally friendly manner to the economy".

The government ensures that WUS does not take advantage of its monopoly position in the regional area by increasing prices. The government controls majority of services through its water regulatory body which determines an acceptable margin level (ROCE) and ensures that the pricing of WUS within these areas does not break this level. The remaining work i.e. a water bottle

operation (WBO) is not regulated by government and WUS charges a market rate for water supply in bottle. The regulator compute return on capital employed (ROCE) of WUS based on its own valuation of the capital assets which are used in operation and the profit from those services.

Acceptable level of ROCE set by the regulator is 7.00%. If WUS breach this level, then the company would be penalized. WUS board is trying to improve the performance for the benefit of the shareholders. In order to communicate the objective of maximizing shareholders' wealth, the directors have decided to consider economic value added (EVA) as the key performance indicator.

Compute EVA of WUS based on the following information for the year ending 31 March 2019:

Particulars	**Water Distribution Operation (WDO)**	**Water Bottle Operation (WBO)**	**Total**
	RS. in Crore	**RS. in Crore**	**RS. in Crore**
Revenue	555.00	186.00	741.00
Less: Operating Cost	460.00	119.00	579.00
Operating Profit	95.00	67.00	162.00
Less: Finance Charges			46.00
Profit Before Tax			116.00
Less: Tax at 30%			34.80
Profit After Tax			81.20
Capital Employed		2018-19	2017-18
		RS. in Crore	RS. in Crore
Audited Accounts		1,616.20	1,495.00
Determined by the Regulator (for WDO Only)		1,558.00	1,422.00

Notes

1. **Operating Costs includes:**

Particular	**2018-19**	**2017-18**
	RS. in Crore	**RS. in Crore**
Depreciation	118	114
Provision for doubtful debts	4	1
Research and Development	24	–
Other non-cash items	14	12

2. Economic depreciation is RS.166 Crore in 2018-19. In FY 2017-18, economic and accounting depreciation were assumed to be the same.
3. Current year tax paid is (RS.18crore) and deferred tax provisions of RS.1.50 crore has been adjusted. There was no deferred tax balance before 2018-19. The provision for doubtful debts was RS.9 crore in the 2018-19 balance sheet.
4. Research and development has been non-capitalized. It belongs to a new project that will be developed over five years and is expected to be of long-term benefit to the company. 2018-19 is the first year of this project.
5. **Cost of Capital**

Equity	14%
Debt (Pre-Tax)	6%

6. **Gearing of WUS**

Equity	45%
Debt (Pre-Tax)	55%

Required

(i) EVALUATE the financial performance of WUS using EVA.
(ii) ASSESS whether WUS comply with its acceptable ROCE level
(iii) Advise on how to improve profitability.

ANSWER :-

(i) Computation of NOPAT

Particulars	RS. in Crore
Operating Profit	162.00
Add:	
Non-Cash Items	14.00
Accounting Depreciation	118.00
Doubtful Debts	4.00
Research and Development	24.00
Less:	
Economic Depreciation	166.00
Tax Paid	18.00
Tax Saving on Interest (RS.46 × 30%)	13.80
NOPAT	124.20

Computation of Capital Employed

Particulars	RS. in Crore
Capital Employed as on 31.03.2018	1,495.00
Add:	
Provision for Doubtful Debt as on 31.03.2018	5.00
Other Non-Cash Items (incurred in 2017-18)	12.00
Adjusted Opening Capital Employed	1,512.00

WACC = 0.45 × 14% + 0.55 × 6% × (1 – 30%)) = 8.61%
EVA = NOPAT – (WACC × Capital Employed) = – 5.98 Crores

Evaluation
Presently, WUS is distorting value as it is not able to meet the economic cost of its own capital. This put the company into the question of perpetual succession and lead the company against shareholder's interest. The reason could be a higher cost of equity for WUS. The investing risk should be low since 75% of the services that the company renders are important for the economy and demand is guaranteed in future. Optionally, WUS needs to either increase its NOPAT enough for break even on economic value added or slash its capital employed by selling unutilized or under-utilized assets.

(ii) Regulatory ROCE: Target 7.00%

$$\text{ROCE} = \left(\frac{OPERATING\ PROFIT}{CAPITAL\ EMPLOYED}\right)$$

$$= \left(\frac{95}{1{,}422}\right) \times 100.00\%$$

$$= 6.68\%$$

The ROCE is within the acceptable ROCE of 7.00%.

(iii) Operating Margins

Water Distribution Operation = 17.12%
Water Bottle Operation = 36.02%

Advise
Operating margin from WBO is 36.02% compared to 17.12% (WDO). WUS may use the WDO activities as a trusted source of cash profit to reinvest in expansion of the WBO. Expansion through acquisition of appropriate non-regulated businesses using the cash generated by the regulated activities might be a good decision.
Further, WUS may improve profitability by controlling costs within WDO activities through performance measurement. The regulatory body cannot argue that the company is overcharging its customers to increase profit margin. This is possible through strict observance of expenses and using cost savings techniques through efficiency improvements. In order to control cost within WDO, targets should be based on minimal variances and adopting cost cutting methods.
Overall, In WDO, there is only a limited scope for increase in the operating profit since the maximum operating profit allowed is RS.99.54 crore i.e. 7.00% of RS.1,422 crore of capital employed. Thus, WUS should go to expand its WBO as this is producing higher operating profit margins.

QUESTION 14

Beta Control (BC) is a global leader in manufacturing of commercial building control systems with over 250 distributors and many thousands of installations in more than 50 countries. Control systems involve air conditioning systems, facility management, energy and water management, access control and security controls etc. At BC, manufacturing is done at a number of factory sites where some products are easy and largely produced and have a long life while other products are intricated and have a short life due to changing technologies. BC's mission statement is 'to keep you ahead through control systems that improve productivity and save energy'.

A Newly appointed chief executive officer (CEO) is anxious about declining share price of BC in the last two years. She identified that the business has grown through acquisition and senior management have focused on making corporate deals but not on making control systems. She announced that the BC's focus must be on optimization and upgradation of its value generation rather than just getting bigger through acquisitions.
Assuming yourself as a performance management expert of BC, the CEO has asked you to aid her in her improvement programme. Firstly, she wants your views on the use of EVA as the key performance metric at BC. You are given the current EVA computation (Annexure1) but there is some suspicion about whether the assistant who has done this work is sufficiently well trained about this method. So, she requires you to examine his accuracy and the assumptions forming part of the calculation.

Required
Write a report to the chief executive officer to EVALUATE the accuracy of the EVA calculation and the assumptions.

--

Annexure 1

NOPAT

Particulars	Year ended 31st March 2019	
	RS. in Lacs (L)	Notes
Operating Profit	1,102.80	
Add:		
Non-Cash Expenses	30.20	
Marketing Expenditure Capitalised	46.20	7
Less:		

Tax	269.60	9
Lost Tax Relief on Interest	48.96	
Net Operating Profit After Tax (NOPAT)	860.64	

Capital Employed

Particulars	Year ended 31st March 2019	
	RS. in Lacs (L)	Notes
From the Statement of Financial Position	4,802.00	10
Add:		
Marketing Expenditure Capitalized	46.20	7
Adjusted Capital Employed	4,848.20	

WACC = (1/2 × 15%) + (1/2 × 7·8%)
= 11.40%
EVA = NOPAT – (WACC × Capital Employed)
= RS.860.64 L – RS.4,848.20 L × 11.40%
= RS.860.64 L – RS.552.69 L
= RS.307.95 L

Assumptions and Notes
1. Debt/Equity 1:1
2. Cost of Equity is 15.00%
3. Cost of Debt (pre-tax) is 7.80%
4. Tax Rate is 30.00%
5. Interest charged in the period was RS.163.20 L.
6. In current fiscal year, BC spend RS.80.00 L in Training and Development by leveraging the latest digital technologies including virtual classrooms to deliver highly relevant training to staff at the point of need.
7. Marketing Expenditure has been RS.46.20 L each year for the last two years to build the long- term brand.
8. The total R & D spending was RS.20 L during this year for in- depth study of the TCP/IP protocols. The TCP/IP based products have not been launched yet.
9. BC has paid Tax of RS.260 L while the tax charged per the accounts was RS.269.60 L.
10. Capital employed during the Period (from the statement of financial position):

Opening	4,564.00 L
Closing	4,802.00 L

ANSWER :-

Report
To: CEO, Beta Control
From: Performance Management Expert
Date: 31st May 2019
Subject: Evaluation of EVA at Beta Control

EVA provides a link between decisions, performance measures and rewards, which focuses managers on performing better. Incentive schemes based on EVA provide better quality information and motivation in making decision which in turn maximise shareholder's wealth. In other words, EVA links the operating returns to the assets that were used to generate those returns. The learning which flows from EVA analyses can be perceptive and can allow the manager not only to identify areas of weakness in performance but also to easily find solutions. BC is a multiproduct company having number of factory sites. EVA

can help to appraise divisional contributors to, or detractors from, overall profitability. Thus, managers may be educated through EVA and pursue such objectives that improve operating profits investing more capital.

In addition, this report deals with evaluation of the accuracy and assumptions used in the calculation of BC's EVA. There are many errors in the present calculation of EVA. These have been discussed below and revised calculations are enclosed.

- Non-Cash Expenses have been correctly added back to the profit as these are expenses which do not affect the cash flow of a given period.
- Addition back of Marketing Expenditure is also correct as spending contributes to future value-creation. For the same reason, the prior year spending is also added in to capital employed.
- Training and Development Expenses should be capitalised. Training and Development Expenses have been treated as an expense in the income statement, they should be added back to profit, and added to capital employed (at the end of the year).
- Research and Development (R & D) Expenses should be treated as marketing expenditure for long period.
- The tax expenses in the EVA calculation should be the tax paid with adjustment for lost tax relief on interest and not the adjusted amount of tax charged in the accounts.
- The WACC is incorrect because it should be based on post-tax cost of debt.
- Generally, a company takes, at least, a year's time to earn a return on investment. Thus, the capital employed figure should be based on the beginning numbers.

NOPAT

Particulars	**Year ended 31st March 2019**
	RS. in Lacs
Operating Profit	1,102.80
Add:	
Non-Cash Expenses	30.20
Marketing Expenditure Capitalised	46.20
Training & Development Expenses	80.00
R & D Expenses	20.00
Less:	
Tax	260.00
Lost Tax Relief on Interest	48.96
Net Operating Profit After Tax (NOPAT)	970.24

Capital Employed

Particulars	**RS. in Lacs**
From the Statement of Financial Position (Starting)	4,564.00
Marketing Expenditure Capitalized	46.20
Adjusted Capital Employed	4,610.20

WACC = (1/2 × 15%) + (1/2 × 7·8% × 70%)
= 10.23%

EVA = NOPAT – (WACC × Capital Employed)
= RS.970.24 L – RS.4,610.20 L × 10.23%
= RS.498.62 L

The recomputed EVA has increased from RS.307.95 Lacs to RS.498.62 Lacs which shows a positive position for BC as it adds up the shareholder's wealth.

QUESTION 15.

Healthcare hospital provides medical care to patients to all strata of the society at nominal cost. Hospital has been operating for the last 15 years. It gets grant from the government that helps it sustain its operations. Each year an annual report is submitted to the officials in the health ministry that is in charge of giving out grants to hospitals. Each year over the last 15 years, grants given to the hospital has been increasing. This increment was found necessary to meet the increase in operational costs due to inflation. While operations have been moderately successful in the recent years, the grants committee is of the opinion that the hospital can manage its funds better.

To benchmark performance, performance of Healthcare hospital is being compared with the performance of another government funded hospital within the same city, Lifeline hospital. Both hospitals have similar scale of operations and get the same amount of gr ant. Given below are some of the parameters that are tracked at both hospitals:

Operational Parameters	**Healthcare Hospital**		**Lifeline Hospital**
	Budget	**Actual**	**Actual**
Total inpatients	1,10,000	96,000	1,00,000
Delay in admission due to unavailability of beds			
Number of inpatients waiting for more than 1 week	1,100	2,880	500
Number of inpatients waiting for more than 2 weeks	-	960	-
Total outpatients	90,000	95,000	93,000
Delay in appointment due to unavailability of medical staff			
Number of outpatients waiting for more than 1 week	900	1,900	465
Number of outpatients waiting for more than 2 weeks	-	475	-
Number of emergency admissions	400	600	500
Delay in providing medical care to emergency admissions	-	5	-
Number of medical staff shortages (positions not filled for more than one month)	3	5	1
Cancelled or delayed operations (due to non-clinical reasons)	5	20	6
Number of complaints received related to medical care	500	1,350	600
Number of complaints resolved within 15 days	500	1,080	550
Number of deaths post operation (all inpatients)	4,400	2,880	2,000
Number of medical negligence case that the hospital lost	2	5	-
Number of errors in prescription of drugs	15	45	10
Number of infection outbreaks within the hospital	-	2	-
Bed occupancy rate	90%	85%	94%
Average patient stay (days)	4	6	5
Operating theatre utilization rate	95%	90%	95%
Revenue including government grant (in crores)	15	13	16
Operating expenses (in crores)	12	12	12
ROI	8%	5%	9%
Staff Training sessions (hours)	500	500	600
Research publications	5	3	6

- Both hospitals have 50 wards with 10 beds in each ward.
- Each hospital has 50 doctors from various specialties and 75 nurses.
- Both hospitals were open all days of the year.

Required

(i) The grants committee wants to ANALYZE performance of both hospitals with respect to:
- Access to services

- Clinical performance
- Efficiency of operations
- Financial management
- Innovations

(ii) While preparing the balanced scorecard, how will you CATEGORIZE the above performance measures?

ANSWER :-

(i) Analysis of Performance of hospital with respect to:

Access to Services:- It is an indicator of whether patients are getting medical care on time or not. It is checked on following parameters.

(a) Delay in admission to inpatients due to unavailability of beds.

(b) Delay in appointments to outpatients due to unavailability of medical staff.

(c) Delay in providing medical care for emergency admission.

(d) Number of medical staff shortages.

(e) Cancelled or delayed operations.

(a) Delay in admission to inpatients due to unavailability of beds :

Operational Parameters	Healthcare Hospital		Lifeline Hospital
	Budget	Actual	Actual
Total inpatients	1,10,000	96,000	1,00,000
Delay in admission			
▪ Patients waiting for more than 1 week	1100 (1% of Total)	2880 (3% of Total)	500 (0.50% of Total)
▪ Patients waiting for more than 2 weeks	-	960 (1% of Total)	-

Analysis

1. Healthcare Hospital has a target to provide admission to 99% inpatients within 1 week while it was able to provide admission to 97% inpatients within 1 week. Lifeline Hospital provided admission to 99.50% inpatients within 1 week. Performance of lifeline hospital is better
2. inpatients waiting for admission for more than 2 weeks is 1% in case of healthcare hospital while there was no such instance in case of lifeline hospital hence performance of lifeline is better.

(b) Delay in admission to inpatients due to unavailability of beds :

Operational Parameters	Healthcare Hospital		Lifeline Hospital
	Budget	Actual	Actual
Total outpatients	90,000	95,000	93,000
Number of outpatients waiting for ▪ more than 1 week ▪ more than 2 week	900 (1%)	1,900 (2%) 475 (0.5%)	465 (0.50%)

Analysis

1. Healthcare Hospital has a target to provide appointment on time to 99% outpatients within 1 week while it was able to provide appointment to 98% outpatients within 1 week. Lifeline Hospital provided appointment to 99.50% outpatients within 1 week. Performance of lifeline hospital is better.
2. Outpatients waiting for appointment for more than 2 weeks is 0.5% in case of healthcare hospital while there was no such instance in case of lifeline hospital hence performance of lifeline is better.

(c) Delay in providing medical care for emergency admission

Operational Parameters	Healthcare Hospital		Lifeline Hospital
	Budget	Actual	Actual

Delay in providing medical care to emergency admissions	-	5	-

Analysis

1. Healthcare hospital was targeting "Zero" delay in providing medical care to emergency admission but there were 5 instances where delay happned. Lifeline has no such instances. Hence lifeline is better.

(d) **Medical staff shortage**

Healthcare has shortage of 5 medical staff for more than 1 month as against target shortage of 1 staff. In comparison, lifeline hospital has only 1 position that was vacant for more than 1 month. Hence lifeline is better.

(E) Cancelled or delayed operations due to non-clinical reasons

Non-clinical reasons means unavailability of operation theatres, unavailability of medical staff & unavailability of required medicine instruments. The actual cancellations of operations due to non-clinical reasons happened 20 times as compared to 5 times as targeted. In comparison, lifeline hospital has only 6 instances of such type hence lifeline is better.

Analysis of performance with respect to Clinical Performance:-

it can be evaluated based on following parameters.

1. Healthcare hospital received 1350 complaints related to medical care while lifeline received only 600 complaints hence healthcare received complaints 2 times. Healthcare resolved 1080 (80%) complaints while lifeline resolved 550 (91.66%) complaints. Both these things shows that lifeline is performing better.
2. Actual number of deaths post operation is less in lifeline as compared to healthcare hospital. It indicates that lifeline is providing good quality services.
3. Health has lost 5 medical negligence cases while lifeline has not lost any such case. It indicates that lifeline is providing good medical services

4. Prescription of drugs to cure an ailment should always be accurate since any error may cause death of patient. There has been 45 such instances where errors were noticed in healthcare in case of healthcare while there are only 10 instances in case of lifeline hospital. It indicates that lifeline has good medical records
5. Outbreak within hospital indicates that proper standards of hygiene were not maintained. So proper hygiene was not maintained in healthcare while there was no such instances. It indicates that lifeline is maintaining proper hygiene.

Analysis of performance with respect to efficiency of operations:-

It can be analysed on following parameters

1. Bed occupancy Rate:- it shows % of beds occupied by patients as compared to total beds available. It shows capacity utilization. Actual bed occupancy rate of healthcare is 85% as against target of 90% while this rate is 94% in case of lifeline. It indicates that lifeline has sufficient number of beds to meet demand.
2. Average patient stay (Days):- Stay depends upon type of ailment. In healthcare, on an average, patient stays in hospital for 2 days more than target of 4 days. More patients can utilize same resources if patient stay is shorter. It indicates that lifeline is performing better in this
3. Operating theaters utilization rate:- This ratio ensures that resources are fully utilized or not. Lifeline hospital is having 95% utilization ratio as compared to 90% in case of healthcare.

On above parameters, lifeline is better

Analysis of performance with respect to Financial Management:-

Healthcare has an actual surplus of Rs.1 Crore as compared to budget of Rs.3 Crores. Surplus means Revenue Minus Operating Expenses. ROI is 5% which is below target of 8%. It indicates funds of government is wasted in healthcare.

Lifeline has surplus of Rs. 4 Crore and at the same time it is earning ROI of 9%.

Therefore lifeline is managing funds in better way i.e. better financial management.

Analysis of performance with respect to Innovations:-

Research publications indicate that newer discoveries have been made in fields that can enhance the horizons of knowledge. Therefore, research publications are an important indicator of innovation. Staff training is not directly related to innovations, they do keep the experts up to date in their subject area of expertise.

Lifeline has 6 research publications while healthcare has only 3 publications. Hence lifeline is better.

(ii) Performance Measures Categorized into the Balance Scorecard

- Customer Perspective would include availability of service measures and clinical performance measures.
- Internal Processes Perspective would include measures used to determine efficiency of operations.
- Financial Perspective would include details of the surplus generated and ROI.
- Learning and Growth Perspective would include staff trainings and research publications.

Combined with other parameters that the grant committee finds important the balanced scorecard can benchmark the hospital's performance with its own targets and the performance of Lifeline hospital. Decision to extend grants and its quantum can be decided on this basis.

QUESTION 16.

Learning Horizons is an educational institute that conducts courses for students in accounting, law and economics. The institute is partially funded by the government. The institute aims to provide quality education to students of all backgrounds. The institute admits students who can fund their education privately as well as those who get sponsorship from the government. Knowledgebase is another educational institute in the same city providing courses similar to Learning Horizons. It is entirely

private funded college where students arrange to pay for their own fees. It can be taken as a peer institution for comparison purposes.

Information about their operations for the year ended March 31, 2019 are as follows:

(1) Both Learning Horizons and Knowledgebase offer their courses that last the entire year. All of them are regular classroom lectures conducted through the week.

(2) Budget and actual fee rate structure for the year are the same. Information about the fees for each course are as follows: Budget and Actual Fees in RS. Course Type Learning Horizons Knowledgebase Privately Funded Government Funded Privately Funded Accounting 1,20,000 75,000 1,00,000 Law 1,20,000 90,000 1,50,000 Economics 80,000 60,000 1,00,000

(3) Salary details for lecturers and administrative staff are as follows: Salaries in RS. Staff Type Learning Horizons Knowledgebase Budget Actuals Actuals Lecturers 5,00,000 5,50,000 6,00,000 Administrative staff 3,00,000 3,00,000 4,00,000

(4) Budgeted costs for the year based on 8,500 students per annum for Learning Horizons are as below: Costs Amount RS. Variable Cost % Fixed Cost % Tuition Material 40,00,00,000 100% --- Catering 10,00,00,000 75% 25% Cleaning 1,00,00,000 25% 75% Other operating costs* 5,00,00,000 25% 75% Depreciation 1,00,00,000 --- 100% * includes cost of freelance staff

(5) Actual costs (other than salary costs) incurred during the year: Costs Learning Horizon Knowledgebase Tuition Material 42,00,00,000 40,00,00,000 Catering 10,00,00,000 13,00,00,000 Cleaning 1,00,00,000 1,50,00,000 Other Operating Costs* 6,00,00,000 5,00,00,000 Depreciation 1,00,00,000 1,50,00,000 * includes cost of freelance staff

(6) Keeping in line with latest technological developments, the management of Knowledgebase is introducing on-line tuition support by its lecturing staff. Learning Horizons on the other hand offers distance learning course. A general feedback from prospective students has revealed that some students would like weekend courses since during the week they focus on their regular jobs. Also, some students have requested for intermediate qualification, in the event that they discontinue the course halfway due to inability to complete the course or for other personal reasons.

(7) Both Learning Horizon and Knowledgebase have a policy to have a lecture staff of 50 throughout the year. When there is a shortfall in teaching staff available, instead of recruiting a fulltime lecturer, Knowledgebase substitutes the requirement with freelance staff for lectures. The cost of freelance staff is much lower than regular staff.

(8) Appendix with further details:

Sundry Statistics
For the year ended 31st March 2019

Particulars	**Learning Horizons**		**Knowledgebase**
	Budget	**Actuals**	**Actuals**
Number of students:			
Accounting	4,000	3,800	4,100
Law	2,500	2,550	2,500
Economics	2,000	1,500	1,200
Total students	8,500	7,850	7,800
Student mix (%) for each course:			
Privately funded	80%	70%	100%
Government funded	20%	30%	0%
Number of enquiries received:			
Accounting	4,500	4,500	4,600
Law	2,800	2,700	3,050
Economics	2,200	1,600	1,225
Total enquiries	9,500	8,800	8,875
Number of lecturers employed during the year	50	50	50
Number of lecturers recruited during the year:			
Accounting	2	4	1
Law	1	3	-

Economics	1	3	-
Total recruitment	4	10	1
Number of administrative staff	12	12	9
Pass Rate:			
Accounting	95%	99%	93%
Law	95%	98%	90%
Economics	95%	95%	95%
Overall Pass rates for the courses	95%	97%	93%
Days in a year when freelance lecturers were used	-	-	30
Number of new courses under development	-	-	6

You are the management accountant of Learning Horizons. The results for the year are to be reviewed next week by the management. To assess performance, you want to prepare the report as per the Fitzgerald and Moon model.

Required

(i) Using the "Results" dimension of performance as per the Fitzgerald Moon model prepare a variance ANALYSIS of Learning Horizons actual and budgeted financial performance. Also, based on the information given in the problem, collate the actual financial figures for Knowledgebase, use it as a basis to prepare ANALYSIS of competitiveness of Learning Horizons and Knowledgebase.

(ii) Using the "Determinants" dimension of performance as per the Fitzgerald Moon model EXPLAIN
(a) Quality of service
(b) Flexibility
(c) Resource utilization
(d) Innovation

(iii) Course fees set by the government for various subjects cannot be increased beyond an average of RS.75,000 per student. If the costs are maintained within this budget, the government can provide more sponsorship or grants in future. ADVISE a method that the management of Learning Horizons can use to resolve this.

ANSWER :-

(i) The Original budget has been prepared for 8500 students while actual enrollments is 7850 students. To calculate variance, we need to make budget based on 7850 students & compare it with actuals at 7850 students.

W. Note 1:- Calculation of actual number of students

- Accounting = 3800 (Given)
- Law = 2550 (Given)
- Economics = 1500 (Given)
- Total = 7850 (Given)

Actual Students Mix (%) for each course between "Privately funded" & "Govt Funded" is 70:30

Course	Total	Total Private Funded (70%)	Govt. Funded (30%)
Accounting	3800	2660	1140
Law	2550	1785	765
Economics	1500	1050	450

W. Note 2:- Calculation of budgeted number of students adjusted according to actual number of students

- Total Actual Students is 7850 and budgeted students mix ratio is 80:20 between privately funded & government funded.
  (RSQ = Divide Total actual in standard ratio)
- And since we have to categorize in course-wise hence we further need to divide in budgeted students ratio i.e. 4000:2500:2000

Course	Total	Total Private Funded (80%)	Govt. Funded (20%)
Accounting		6280 x 40/85 = 2955	1570 x 40/85 = 739
Law		6280 x 25/85 = 1847	1570x 25/85 = 462
Economics		6280 x 20/85 = 1478	1570x 20/85 = 369
Total	7850	7850 x 80% = 6280	7850 x 20% = 1570

Statement showing budgeted & actuals for "Learning Horizons" & actuals for Knowledgebase

Particulars	Learning Horizons				Knowledgebase	
	Budget		Actual		Actual	
	Number	Amount Rs.	Number	Amount Rs.	Number	Amount Rs.
Revenue						
(a) Private Funded						
Accounting@ Rs.120000 per	2,955	35,46,00,000	2,660	31,92,00,000	4,100	41,00,00,000

student						
Law@ Rs. 120000 per student	1,847	22,16,40,000	1,785	21,42,00,000	2,500	37,50,00,000
Economics@ Rs.80000 per student	1,478	11,82,40,000	1,050	8,40,00,000	1,200	12,00,00,000
subtotal (a)	6,280	69,44,80,000	5,495	61,74,00,000	7,800	90,50,00,000
(b) Government Funded						
Accounting@ Rs.75000 per student	739	5,54,25,000	1,140	8,55,00,000	---	---
Law@ Rs.90000 per student	462	4,15,80,000	765	6,88,50,000	---	---
Economics@ Rs.60000 per student	369	2,21,40,000	450	2,70,00,000	---	---
Subtotal (b)	1,570	11,91,45,000	2,355	18,13,50,000	---	---
Total Revenue (a)+(b)	7,850	81,36,25,000	7,850	79,87,50,000	7,800	90,50,00,000
Expenditure						
Salaries Lecturers@Rs. 5 Lakh/5.50 Lakh per student	50	2,50,00,000	50	2,75,00,000	50	3,00,00,000
Salaries Administrative staff @Rs.3 Lakh /3 Lakh per student	12	36,00,000	12	36,00,000	9	36,00,000
Tuition Material	W.N-3	36,94,11,765	Given	42,00,00,000	Given	40,00,00,000
Catering	W.N-3	9,42,64,706	Given	10,00,00,000	Given	13,00,00,000
Cleaning	W.N-3	98,08,824	Given	1,00,00,000	Given	1,50,00,000
Other Operating Costs	W.N-3	4,90,44,118	Given	6,00,00,000	Given	5,00,00,000
Depreciation	W.N-3	1,00,00,000	Given	1,00,00,000	Given	1,50,00,000
Total Expenditure		56,11,29,413		63,11,00,000		64,36,00,000
Net Profit		25,24,95,587		16,76,50,000		26,14,00,000

W.N-3 Calculation of Budgeted amount from Learning Solutions. Budget amount has been given for 8500 students but actual students were 7850 so variable cost shall be adjusted for this and fixed part shall also be further added.

Particulars	Variable part	Fixed part	Adjusted Variable part	Fixed	Total
Tuition Material	40 Crore x 100% = 40 Cr.	NIL	40 Cr. X 7850 / 8500 = 36,94,11,765	NIL	36,94,11,765
Catering	10 Cr. X 75% = 7.50 Cr.	2.50 Cr.	7.5 Cr. X 7850 / 8500 = 6,92,64,705	2.5Cr	9,42,64,705
Cleaning	1 Cr. X 25% = 25 Lakh	75 Lakh	25 Lakh X 7850 / 8500 = 23,08,823	75 Lakh	98,08,824
Other Operating Cost	5 Cr. X 25% = 1.25 Cr.	3.75 Cr.	1.25Cr. X 7850 / 8500 = 1,15,44,117	3.75Cr	4,90,44,118
Depreciation		1 Cr.		1 Cr.	1 Cr.

Variance Analysis of Learning Horizons Actual & Budgeted Financial performance

1. There is a variance between Budgeted number of students and actual number of students. Budgeted students were 8500 while actual students were 7850.
2. Budgeted sales is Rs.81.4 Crore and actual sales is Rs.80 Crore. Reasons for this change is change in students mix ratio from 80:20 to 70:30. This cannot be due to fees since budgeted & actual fees per student is same
3. Actual exp. Cost is Rs. 63 crore approx. while budgeted is 56 crore. Actual cost is more than 12% of budgeted cost. This is due to 2 reasons
   a. 1st reason is that actual salary of lecturer is higher than budgeted salary
   b. 2nd reason is that change in students mix ration from 80:20 to 70:30.

Competitive Performance of Learning Horizons and Knowledgebase

Average Revenue and Cost per student

Particulars	Learning Horizons		Knowledgebase
	Budget	Actual	Actual
Total revenue (Rs.)	81,36,25,000	79,87,50,000	90,50,00,000
Number of students	7,850	7,850	7,800
Revenue per student (Rs.)	1,03,646	1,01,752	1,16,026
Total cost (Rs.)	56,11,29,413	63,11,00,000	64,36,00,000
Number of students	7,850	7,850	7,800
Cost per student (Rs.)	71,481	80,395	82,513

The cost per student at Learning Horizons is marginally lower than Knowledgebase. However, the revenue per student at Knowledgebase is much higher. Analyzing the components further:

(a) **Student Mix**: Knowledgebase has higher revenue by more than 10 crore, almost 13.3% higher compared to Learning Horizons. Reasons could be on account a higher fee rate structure at Knowledgebase as compared to Learning Horizons, where part of the fee structure is government funded at a lower rate.

(b) **Course Rate**: Learning Horizons charges Rs.1,20,000 per year for its accountancy course which is higher compared to Knowledgebase's rate of Rs.100,000 per year. This might be a reason for a higher enrollment at Knowledgebase of 4,100 students compared to Learning Horizons enrollment of 3,800 for the same course. The management has to verify if this higher ra te is sustainable.

(c) **Course Rate:** Learning Horizons charges Rs.120,000 for its law course compared to Rs.150,000 at Knowledgebase. However, despite being lower, the enrollment for the course is almost the same. The management has to look at non-financial parameters related to quality, in order to improve enrollments for this course.

(d) **Course Rate**: Learning Horizons charges Rs.80,000 for its economics course compared to Rs.100,000 at Knowledgebase. Consequently, it is able to have higher enrollment for its economics course.

(e) Compared to Learning Horizons, Knowledgebase is incurring Rs.2 crore lesser on tuition materials. As pointed out earlier, Learning Horizons must try to find out reasons for its higher cost and try to economize on this expense, if required

(f) Knowledgebase has been using freelance staff for 30 days in a year to keep its expenses lower. Therefore, although it has a higher pay scale for its lecturers, it uses a lower cost resource to meet its teaching staff requirements. Compared to 1 new recruitment by Knowledgebase, Learning horizons has 10 new recruitments during the year. Knowledgebase has substituted any shortfall in teaching staff by hiring freelancers during the year. At the same time, non-financial aspects like quality of education need to be assessed while using the service of freelancers.

(g) The other indicator of competitive performance, the take up rate, the rate of conversion of enquiries from prospective students into enrollments for the course. Reference to the budget here is the original budget prepared for 8,500 students, which represents the capacity that Learning Horizons wants to achieve.

Particulars	Learning Horizons		Knowledge.
	Budget	**Actual**	**Actual**
Accounting - Number of students	4,000	3,800	4,100
Number of enquiries	4,500	4,500	4,600
Take up rate	**89%**	**84%**	**89%**
Law - number of students	2,500	2,550	2,500
Number of enquiries	2,800	2,700	3,050
Take up rate	**89%**	**94%**	**82%**
Economics - number of students	2,000	1,500	1,200
Number of enquiries	2,200	1,600	1,225
Take up rate	**91%**	**94%**	**98%**
Overall - number of students	8,500	7,850	7,800
Number of enquiries	9,500	8,800	8,875
Take up rate	**89%**	**89%**	**88%**

The take up rate is lower for accounting course at Learning Horizons as compared to Knowledgebase. As explained in point (b), this may be attributed to the higher rate that Learning Horizons charges privately funded students. The higher rate should be justifiable.

The take up rate for law is higher compared to Knowledgebase. As explained in point (c) this could

be due to the lower fee rate. Higher enrollment could indicate the popularity of the course. At the same time the comparative pass rate may have to be looked into to judge the quality of the course.

The take up rate for economics is marginally lower than Knowledgebase. However, overall enrollment for this course is much higher compared to Knowledgebase, possibly to the substantially lower rate offered for the course. The management could look at better publicity to improve the take up rate.

(ii) **Analysis of the "Determinants"** dimension of performance as per the Fitzgerald and Moon model

Quality of Service

The pass rate for each course indicates the quality of course offered. Summarizing from the problem:

Pass rate

	Learning Horizons		Knowledgebase
	Budget	**Actual**	**Actual**
Accounting	95%	99%	93%
Law	95%	98%	90%
Economics	95%	95%	95%
Overall Pass rates for the courses	95%	97%	93%

The targeted pass rate of 95% has been met in all courses, thereby it indicates that a satisfactory level of education is being imparted. In comparison with Knowledgebase the pass rate for all courses is higher, which is a good indicator. This could be a reason to justify the use of full time staff instead of substituting it with freelancer staff.

In the case of accountancy, the management can use the higher pass rate to justify the higher course rate, which may lead to better enrollments for the course. In the case of law, it has the potential of becoming a very popular course, lower course fee with higher pass rate. This can be used to improve enrollments. In the case of economics, the pass rates are at par. The management may use the lower course fee to attract students else may find other ways to make the course more attractive to have higher enrollments.

Feedback from current students and the institute's alumni also provide value information about the quality of the courses and opportunities to improve.

Flexibility

The management of Learning Horizons has to consider the feedback from current and prospective students in order to bring in flexibility to their services. While long distance learning offers some flexibility, the management has to look at alternate channels of delivery like online lecture support by faculty similar to the model that Knowledgebase has developed. Also, offering weekend courses could help improve enrollments. Providing the option to get an intermediate degree gives flexibility to students who are not able to cope up with the course. While this cannot be a main objective of the institute, it still can maintain its motto of imparting quality education for students of all backgrounds.

Resource Utilization

The main resource of an educational institute is its staff. Management of Learning Horizon has to look at the teacher student ratio and compare it to benchmarks of peer institutes. Learning Horizons is having a higher recruitment of 10 lecturer s for the year as compared to a budget of 4 recruitments for the year. Reasons for the same need to be looked into. One reason could be a higher turnover ratio among lecturers due to lower salary paid in comparison to the market rate. In comparison, Knowledgebase has a more stable staff, having a recruitment of only 1 lecturer during the entire year. This might be due to the use of freelance teaching staff. Learning Horizon can explore options of using freelance teaching staff to meet its teaching needs, without compromising quality of education.

Innovation

From the information provided, Learning Horizons has a better quality of service in terms of pass rates. However, Knowledgebase planning to offer 6 new courses in the future. Learning Horizons has to explore options to improve on its current course offerings in order to maintain its market share.

(iii) There is a limit to fees sponsored by the government. Currently, government funded revenue is Rs.18 crore, almost 23% of the total revenue of 80 crore. Aver age actual cost per student, referring to the table above, is Rs.80,395. Since, the government is unwilling to spend more than Rs.75,000 per student, the management could look at target costing methods to resolve this issue. This reduction of Rs.5,395 per student can be achieved by identifying opportunities to economize on costs. If feasible, the cost per student can be

calculated for each of the courses, to identify where these economies can be achieved. This drive should encompass the administration and support services too. Thus, using target costing approach, the cost can be reduced below Rs.75,000 to make government funded education profitable, within reasonable limits.

QUESTION 17.

PHL, South Asia's premier express air and integrated transportation & distribution firm, offers a wide range of innovative supply chain services including Express Distribution, 3PL and Consulting. PHL offers innovative logistics solutions to its customers, enabling them to focus on their core competencies. The firm adds maximum value to businesses at every level, right from providing world-class warehousing support to ensuring time-definite deliveries of goods anywhere in Country 'X'.

The following information is available:

(1) Each warehouse of PHL is solely responsible for all customers within a specified area. It collects couriers from customers residing within ambit of its own area for delivery both within the specific area covered by the warehouse and elsewhere in India.

(2) After collections of couriers, a warehouse forward them for delivery outside its own area to the warehouses from which the deliveries are to be made to the customers.

(3) Therefore, each warehouse must integrate its deliveries to customers to include:
- **(i)** couriers that it has collected within its own area; and
- **(ii)** couriers that are transferred to it from other warehouses for delivery to customers in its area.

(4) Each warehouse's revenue is based on the invoice value of all couriers collected from customers in its area, irrespective of the location of the ultimate distribution warehouse.

(5) Each warehouse costs consist its own operating costs plus some allocated proportion including centralised administration services (i.e. salary, legal & professional fees etc.) and distribution centre costs.

(6) The management team and all employees of each warehouse are paid incentives which remains payable quarterly. The bonus is based on the achievement of a series of target values by each warehouse.

(7) Internal benchmarking is used at PHL as to provide sets of absolute standards that all warehouses are expected to achieve.

(8) The Annexure exhibit the target values and the actual values achieved for each of a sample group of four warehouses situated in City SG, City HK, City NY, and City NZ. The target values consist of:
- **(i)** Warehouse revenue and profitability;
- **(ii)** Courier delivery services and customer care; and
- **(iii)** Credit period control and administrative efficiency.

Incentives are based on a points system. It is also used as a stimulus for each warehouse improving the operational effectiveness. One point is awarded in case where the target value for each item in the Annexure is either achieved/ exceeded, and a zero point where the target is not achieved.

Annexure

Revenue and Profitability

Particulars	Revenue		Profit	
	Target	Actual	Target	Actual
	Rs.million	Rs.million	Rs.million	Rs.million
Company Overall	300	360	45	48
Warehouse City SG	24.00	22.50	3.60	3.45
City HK	21.00	27.00	3.15	3.60

City NY	18.00	21.00	2.70	3.30
City NZ	27.00	33.00	4.05	4.20

In order to calculate points of each warehouse, actual profit as a % of actual revenue must exceed the target profit as a % of target revenue.

Courier Delivery Services and Customer Care

Particulars	Target %	Actual			
		SG %	HK %	NY %	NZ %
Measure (% of total):					
Late collection of couriers	3.00	2.85	3.15	2.70	3.60
Misdirected couriers	6.00	6.30	5.85	4.95	7.65
Delayed response to complaints	1.50	1.05	1.35	1.20	1.80
Delays due to vehicle breakdown	1.50	1.65	2.10	0.45	3.00
Measure (% of revenue):					
Lost items	1.50	0.90	1.35	1.20	2.85
Damaged items	3.00	2.25	3.60	2.25	2.70

Credit Control and Administration Efficiency

Particulars	Target %	Actual			
		SG %	HK %	NY %	NZ %
Average debtor weeks	5.50	5.80	4.90	5.10	6.20
Debtors more than 60 days (% of total)	5.00	?	?	?	?
Invoice queries (% of total)	5.00	1.50	1.40	0.80	2.70
Credit notes as a % of revenue	0.50	?	?	?	?

Other Information

('000)

Particulars	SG	HK	NY	NZ
Debtor Aging Analysis (extract)				
Less than 30 days	1,950.00	2,250.00	1,770.00	3,000.00
31–60 days	481.50	199.50	229.50	828.00
Value of Credit Notes raised during the period	67.50	54.00	42.00	198.00

Note: PHL operates all year round.

Required

Prepare a report for the directors of PHL.

(i) ANALYSE the comparative performance of the four warehouses.

(ii) ASSESSE PHL from perspective of financial performance, service quality, resource utilisation, flexibility, innovation, and competitiveness; and

(iii) EVALUATE the performance measurement system at PHL.

ANSWER :-

To: The Directors of PHL

From: Management Accountant Subject:

Warehouse Performance Date: 11th May 2019

(i) NY has achieved the best performance with (12) points. SG and HK have given a reasonable level of performance with (8) points each. NZ is under performed earning only (4) out of the twelve points.

NY is the only warehouse which has achieved both increased revenue and increased profit over targets.

In the courier delivery services and customer care, NY has achieved all (6) of the target standards, SG (4); HK (3). The data of NZ indicates, the need for investigation due to achievement of only (1) out of six targets.

In respect of the credit control and administrative efficiency, HK and NY have achieved all (4) standards and SG has achieved (3) of the four standards. Once again, NZ is the 'bad performer' and achieved only (2) of the four standards.

(Refer points table)

(i) The terms mentioned in the problem might be seen as representative of the dimensions of performance. The analysis of dimensions may be translated into results and determinants.

Results are the outcome of decisions and actions taken by management in the past. Measurement of the results may be done by focusing on financial performance and competitiveness. Financial performance may be measured in terms of revenue and profit as shown in the points table. The points system shows which warehouses have achieved or exceeded the target. Besides, liquidity is another criterion for the measurement of financial performance. The total points in table showed that HK and NY warehouses appear to be the best performer in aspects of credit control. Competitiveness may be assessed in terms of sales growth or in terms of market share or increase in customers etc.

The determinants are the factors which may be seen to contribute to the achievement of the results. In other words, Determinants refer to the forward-looking dimensions of Fitzgerald and Moon model, for example- what areas of future performance are most important for PHL to achieve positive financial and competitive results? Quality, resource utilization, flexibility and innovation are the determinants of future success and they are also the contributors to the achievement of competitiveness and financial performance.

In PHL a main quality issue seems to be courier delivery services and customer care. Points table shows that the NZ warehouse has a major problem in this area and achieved only (1) point out of the six available.

Resource utilisation for PHL is critical to its financial success and may be measured by effective and efficient use of drivers, vehicles, and financial resources. To some extent, such measurement can be seen in the data relating to courier delivery services and customer care. For example, the reason of late collection of couriers from customers may be a shortage of vehicles and/or drivers. Such shortages might be due to sickness, staff shortage, problems of vehicle availability, vehicle maintenance etc.

Flexibility may be an issue like varied range of service as to meet different segment of customer is unavailable. Possibly, a short-term sub-contracting of vehicles or collections or deliveries may help in overcoming late collection problems.

The points table i.e. 'target vs actual' may be considered as an example of innovation by PHL. This gives a comprehensive set of measures providing an incentive for improvement at all warehouses. The points table may demonstrate the extent of achievement or non-achievement of PHL strategies for success. For instance – the firm may have a customer care commitment policy which identifies factors that should be achieved on a continual basis. For example, timely collection of couriers, misdirected

couriers re-delivered at no extra charge, prompt responses to customer claims and compensation for customers.

(ii) The performance measurement system used by PHL is simple to use. However, it may be looked upon measuring the right things since the specific measures used in point s table encompass a range of dimensions designed to focus the organization on factors essential for PHL's success and not restricted to traditional financial measures.

At PHL, internal benchmarking has been used to provide sets of absolute standards that all warehouses are expected to achieve. This will help to ensure a continuous focus upon the adoption of 'best practice' at all warehouses. Benchmarks on delivery performance give importance to quality of service whereas benchmarks on profitability i.e. target profits focus solely upon profitability.

Incentive schemes have been used at PHL, linking the achievement of firm targets with rewards. It might happen that the profit incentive would act as a booster to each warehouse management team. However, what is required for the prosperity of PHL is a focus of management on the determinants of success rather than the results of success.

Workings

Warehouse – Points Table for the year ended 31 March 2019

	SG	**HK**	**NY**	**NZ**
Revenue and Profit				
Revenue	0	1	1	1
Profit (see note below)	1	0	1	0
Total Points earned …(A)	1	1	2	1
Ranking	II	II	I	II
Courier Delivery Services and Customer Care				
Late collection of couriers	1	0	1	0
Misdirected couriers	0	1	1	0
Delayed response to complaints	1	1	1	0
Vehicle breakdown delays	0	0	1	0
Lost items	1	1	1	0
Damaged items	1	0	1	1
Total Points earned …(B)	4	3	6	1
Ranking	II	III	I	IV
Credit Control and Administrative Efficiency				
Average Debtor weeks	0	1	1	0
Debtors more than 60 days	1	1	1	1
Invoice queries (% of total)	1	1	1	1
Credit notes (% of revenue)	1	1	1	0
Total Points earned …(C)	3	4	4	2
Ranking	II	I	I	III
Total Points …(A)+(B)+(C)	8	8	12	4

(a) Profit Points Calculation
Actual Results e.g. SG = 3.45/22.50 = 15·3% (1 point); HK = 3.60/ 27.00 = 13·3% (0 point)

(b) Debtors more than 60 days (% of total)

Particulars	SG	HK	NY	NZ
Revenue ('000)	22,500	27,000	21,000	33,000
Debtor weeks	5.80	4.90	5.10	6.20
∴ Debtors …(A)	2,510	2,544	2,060	3,935
Less than 30 days …(B)	(1,950)	(2,250)	(1,770)	(3,000)
31–60 Days …(C)	(481.50)	(199.50)	(229.50)	(828.00)
More than 60 days …(A) - (B) - (C)	78.50	94.50	60.50	107.00
Debtors in more than 60 days (% of total)	3.13	3·71	2·94	2·72

(C) Value of credit notes raised as a % of revenue e.g. SG = Rs.67,500/ Rs.2,25,00,000 = 0·30%

QUESTION 18.

West Coast community operates Homelessness Services (HS) on a not-for-profit basis as a local solution to local housing needs. The primary objective is to meet the accommodation needs of persons within its locality targeting those living in the low/middle income groups and senior citizens. Accommodation is basically furnished; it consists of a small house, with kitchen, bathroom, bedroom/(s), and a sitting room. HS manages 450 such houses across various localities. Exclusive Services (ES) is a profit-seeking organisation which provides rented accommodation to the public. ES manages 200 such houses across localities similar to HS' operations.

Income and Expenditure accounts for the year ended 31st March 2019 were as follows:

	HS (Rs.)	ES (Rs.)
Rent Received	1,02,98,600	1,09,98,000
Less:		
Employee Costs	24,00,000	38,00,000
Planned Maintenance and Substantial Repairs	34,19,500	10,41,000
Running Repairs	23,91,600	6,38,000
Miscellaneous Operating Costs	15,27,500	11,75,000
Insurance, Property Taxes, and Interest etc.	13,15,500	18,75,000
Operating (Deficit)/ Surplus	(7,55,500)	24,69,000

Operating Information in respect of the year ended 31st March 2019 was as follows:
House and rental information:

Size of House	Number of Houses		Rent per Week (Rs.)	
	HS	ES	HS	ES
1 Bedroom +	40	20	400	750
2 Bedrooms +	80	40	450	800
3 Bedrooms +	250	140	500	1,175
4 Bedrooms +	80	Nil	700	N.A.

HS had certain houses that were unoccupied during part of the year. The rents lost as a consequence of unoccupied properties amounted to Rs.18,17,400. ES did not have any unoccupied houses at any time during the year.

Employees were paid as follows:

Number of Staff		Salary per Staff Member (Rs.) per annum	
HS	ES	HS	ES
1	2	3,00,000	5,00,000
2	2	2,50,000	3,00,000
4	11	2,00,000	2,00,000
8	-	1,00,000	-

Planned maintenance and substantial repairs undertaken:

Nature of Work	Number of Houses		Cost per House (Rs.)	
	HS	ES	HS	ES
Miscellaneous Building Work	10	-	12,500	-
Sanitary Fittings (Kitchen + Bathroom) [all are the same size]	45	5	26,100	52,200
AC Upgrades/ Replacements	8	-	15,000	-
Replacement of Wooden Structure for 3-Bedroomed Houses	50	13	40,000	60,000

Running Repairs Information:

Classification of Repair	Number of Repair Undertaken		Total Cost (Rs.)
	HS	ES	HS
Emergency	480	160	6,72,000
Urgent	990	376	11,28,000
Non-urgent	560	102	5,91,600

Each repair undertaken by ES costs the same irrespective of the classification of repair.

Required

(i) Critically EVALUATE how the management of Homelessness Services could measure the 'Value for Money' of its service provision during the year ended 31 March 2019.

(ii) IDENTIFY, 2 performance measures in relation to Flexibility and Service Quality (dimensions of performance measurement).

(iii) ANALYSE, 3 performance measures relating to 'Cost and Efficiency' that could be utilised by the management of Homelessness Services when comparing its operating performance against that achieved by Exclusive Services.

ANSWER :-

(i) HS is providing services to needy people. It is not aiming at profit making. But certain standards must be set to ensure that the objectives, for which it has been formed, are achieved. It aims ate social welfare. Value for Money is assessment of services offered by company based on economy, efficiency & effectiveness.

1) Effectiveness means assessment of whether company achieved its objectives or not.
   - Are tenants satisfied with accommodation?
   - Are buildings has been constructed with cost-effectiveness?
   - Total number of HS houses are 450 while total number of ES houses are only 200 hence HS has more capacity to provide room to homeless
2) Efficiency means assessment of whether resources & funds are utilized properly or not
   - Hiring labour for repair & maintenance on work basis inspite of hiring on fixed salary basis.
   - Employee cost to rent received ratio is 23.30% for HS while it is 34.55% for ES hence HS is more efficient on this parameter.

3) Economy means assessment of whether desired output produced at lowest cost without compromising quality or not
    - Furniture fitting, AC Fitting by low-cost skilled labour.
    - HS repaired fittings of 45 houses at a cost of Rs.26,100 each while ES repaired fittings of only 5 houses at a cost of Rs.52,200 (higher cost). It means HS is more economical as compared to ES assuming quality of fittings is same. HS is also more economical when it is compared on the basis of "replacement of wooden structure"

HS has strong commitment towards "Value for money" .

(ii) Following are the 2 performance measures in relation to Flexibility and service quality

1) Flexibility:- it means ability to cater new demands of customer. This can be measured by service delivery time and promptness in responding to customer requests.
    - If average waiting time for a tenant for a house is increasing and company is able to add more houses for renting then it is flexible
    - If customer demand house of different size & company is able to make it available then it is flexible
    - If customer has reported emergency repair to be done & company is able to get it done then it is flexible
2) Service Quality:- it means measurement of how well delivered services satisfies to requirements of customers. Following are 2 performance measurement parameters
    - If company is ensuring safety standards around residential unit then it is providing good service
    - If staff is proactively taking care of repairs then it is providing good service.

(iii) Performance measures relating to 'Cost and Efficiency' that could be utilized are as follows

1. Average Employee Cost per week per house

HS (Average Employee Cost per week per house) = $\frac{\text{Rs.24,00,000}}{\text{52 Weeks x 450 HS Houses}}$ = Rs. 102.56

ES (Average Employee Cost per week per house) = $\frac{\text{Rs.38,00,000}}{\text{52 Weeks x 200 HE Houses}}$ = Rs. 365.38

Average employee cost per week per house of HS is just approx. 28% of average Employee Cost per week per house of ES.

It means HS is efficient they are managing more houses with same number of employees (15 Employees). HS is effective since they are using cheap labour since salaries are less

2. Average Running Repairs per week per house

HS (Average running repairs per week per house) = $\frac{\text{Rs.23,91,000}}{\text{52 Weeks x 450 HS Houses}}$ = Rs. 102.17

ES (Average running repairs per week per house) = $\frac{\text{Rs.6,38,000}}{\text{52 Weeks x 200 HE Houses}}$ = Rs. 61.35

Average running repairs per week per house of ES is approx. 60% of average running repairs

per week per house of HS.

It means ES is effective since they don't required too much regular repairs.

3. Rent Lost

There is rent lost of Rs.18,17,400 in HS whereas there is no such rent lost in case of ES. There is 100% occupancy in ES. Hence management of HS should identify the reasons why the houses remain unoccupied in HS.

QUESTION 19.

B Ltd. makes three products X, Y and Z in Divisions X, Y and Z respectively. The following information is given:

	X	Y	Z
Direct Material (Rs. / Unit) (excluding material X for Divisions Y and Z)	8	22	40
Direct Labour Rs. / Unit)	4	6	8
Variable Overhead (Rs. / Unit)	2	2	2
Selling price to outside customers (Rs. / Unit)	25	65	90
Existing capacity (no. of units)	6,000	3,000	3,000
Maximum external Market demand (no of units)	5,000	5,500	5,000
Additional fixed cost that would be incurred to install additional capacity (Rs.)	45,000	9,000	23,100
Maximum additional units that can be produced by additional capacity	6,000	2,000	2,250

Y and Z need material X as their input. Material X is available in the market at Rs.23 per unit. Defectives can be returned to suppliers at their cost. Division X supplies the material free from defects and hence is able to sell at Rs.25 per unit. Each unit of Y and Z require one unit of X as input with slight modification.

If Y purchases from outside at Rs.23 per unit, it has to incur Rs.3 per unit as modification and inspection cost. If Y purchases from Division X, it has to incur, in addition to the transfer price, Rs.2 per unit to modify it. If Z gets the material from Division X, it can use it after incurring a modification cost, of Rs.1 per unit.

If Z buys material X from outside, it has to either inspect and modify it at its own shop floor at Rs.5 per unit or use idle labour from Division X at Rs.3 per unit. Division X will lend its idle labour as per Z's requirement even if Z purchases the material from outside.

The transfer prices are at the discretion of the Divisional Managers and will remain confidential. Assume no restriction on quantities of inter-division transfers or purchases.

Required

DISCUSS with relevant figures the best strategy for each division and for the company as a whole.

ANSWER :-

Statement Showing "Contribution per unit" **(Rs.)**

Particulars	Division X			Division Y		Division Z
	Sale to	Internal Transfer to		Purchase from	Transfer from	Transfer from
	Outside	Y	Z	Outside	X	X
Selling Price	25.00	---	---	65.00	65.00	90.00
Transfer Price	---	24.00*	25.00#	---	---	---
Direct Material (Excluding Material 'X')	8.00	8.00	8.00	22.00	22.00	40.00
Direct Labour	4.00	4.00	4.00	6.00	6.00	8.00
Variable Overhead	2.00	2.00	2.00	2.00	2.00	2.00

Purchase Price 'X'	---	---	---	23.00	---	---
Transfer Price 'X'	---	---	---	---	24.00	25.00
Modification Cost	---	---	---	3.00	2.00	1.00
Contribution	11.00	10.00	11.00	9.00	9.00	14.00

(*) Division 'Y' will not pay Division 'X' anything more than Rs.24, because at Rs.24, it will incur additional cost of Rs.2 per unit to modify it, Rs.23 + Rs.3 = Rs.26, the outside cost.

(#) To purchase material X from outside is costly for Division 'Z' as after modification at own shop floor, cost of the same comes to Division 'Z' is Rs. 28 (Rs.23 + Rs.5).
If Division 'X' goes to utilize its full capacity in that case labour would not be available for modification to Department 'Z'.

Accordingly Division 'Z' may purchase material X at Rs.25 from Division 'X' i.e. market price to outsiders.

Statement Showing "Internal Transfer Decision (units)"

Particulars	**X**	**Y**	**Z**
Existing Capacity …(A)	6,000 units	3,000 units	3,000 units
Maximum Capacity that can be added …(B)	6,000 units	2,000 units	2,250 units
Total Maximum that can be produced …(C)=(A)+(B)	12,000 units	5,000 units	5,250 units
Maximum External Demand …(D)	5,000 units	5,500 units	5,000 units
Balance …(C) – (D)	7,000 units	---	250 units
Internal Transfer to Other Divisions	5,000 units to Z* 2,000 units to Y	N.A.	N.A.
Internal Transfer from Other Divisions	N.A.	2,000 units transfer from X (material X)	5,000 units transfer from X (material X)

(*) Division 'X' will supply its production to Division 'Z' first (after meeting its external requirement) as contribution from product Z is high.

Statement Showing "Decision Whether to Expand or Not" **(Rs.)**

Particulars	**X**	**Y**	**Z**
Additional Fixed Cost on Expansion	45,000	9,000	23,100
Contribution that can be earned by expansion	64,000 (4,000 units × Rs.11 + 2,000 units × Rs.10)	18,000 (2,000 units × Rs.9)	28,000 (2,000* units × Rs.14)
Net Benefit from Expansion	19,000	9,000	4,900
Decision	Expansion	Expansion	Expansion

(*) As maximum demand of product Z is 5,000 units which Division 'Z' first complete with existing capacity of 3,000 units. Balance 2,000 units from expansion.

Statement Showing "Net Revenue Addition" **(Rs.)**

Particulars	**X**	**Y**	**Z**	**Total**
Contribution – External Sales	55,000 (5,000 units × Rs.11)	45,000 (5,000 units × Rs.9)	70,000 (5,000 units × Rs.14)	1,70,000

Contribution – Internal Transfer	75,000 (2,000 units × Rs.10 + 5,000 units × Rs.11)	---	---	75,000
Additional Fixed Cost	45,000	9,000	23,100	77,100
Net Revenue Addition				1,67,900

Strategy for Company & Divisions

(i) Division 'X' will transfer maximum possible material to Division 'Z' as Division 'Z' is offering maximum transfer price to Division 'X'. At the same time Division 'Z' is fetching maximum contribution for the organisation so it is beneficial for both the Divisions as well as organisation as a whole.

(ii) As shown above all the three Divisions are getting net benefit when they are taking decision to expand and hence, all the three Divisions should expand their activity by incurring additional fixed cost on expansion.

QUESTION 20

Centurion Co. operates a Pulp Division that manufactures Wood Pulp for use in production of various paper goods. **The following information are available:**

	Rs.
Selling Price	210
Less: Variable Expenses	126
Contribution	84
Less: Fixed Expenses (based on a capacity of 1,00,000 kgs per year)	54
Net Income	30

Centurion Co. has just acquired a small company that manufacturers paper cartons. This company will be treated as a division of Centurion with full profit responsibility. The newly formed Carton Division is currently purchasing 10,000 kgs of pulp per year from supplier at a cost of Rs.210 per kg less a 10% quantity discount. Centurion's President is anxious that the Carton Division begins purchasing its pulp from the Pulp Division if an acceptable transfer price can be worked out.

Situation I

If the Pulp Division is in a position to sell all of its pulp to outside customers at the normal price of Rs.210 per kg, will the Managers of the Carton and Pulp Division agree to transfer 10,000 kgs of pulp next year at a determined price? EXPLAIN with reasons.

Situation II

Assuming that the Pulp Division is currently, selling only 60,000 kgs of pulp each year to outside customers at the stated price of Rs.210 per kg will the Managers agree to a mutually acceptable transfer price for 10,000 kgs of pulp in next year? EXPLAIN with reasons.

Situation III

If the outside supplier of the Carton Division reduces its price to Rs.177 per kg, will the Pulp Division meet this price? EXPLAIN. If the Pulp Division does not meet the price of Rs.177 per kg, what will be the effects on profits of the company as a whole?

ANSWER :-

Situation I

The lowest transfer price from the viewpoint of the selling division is calculated as below:-

TF Price = Variable cost per unit + contribution margin lost per unit

We know that The Pulp Division has no idle capacity

Hence TF Price = Rs.126 + Rs. 84 = Rs.210 per unit

Therefore, the Pulp Division will refuse to transfer at a price less than Rs.210 per kg.

The Carton Division is buying from an outside supplier for Rs.210 per kg, less a 10% quantity discount i.e. Rs.189 per kg. Therefore, the Division would not pay more than Rs.189 per kg.

The Carton Division won't pay more than Rs.189 and the Pulp Division will not sell at less than Rs.210. Thus, there can be **no mutually agreeable transfer price and no internal transfer will take place**.

Situation II

Since The Pulp Division has idle capacity of 40000kg while carton division only needs 10000 kg hence pulp division will not loss any contribution if it transfer to carton division.

So Minimum TF Price = Rs.126 + Rs.0 = Rs.126

The Carton Division won't pay more than Rs.189. hence if managers co-operate with each other then both can get benefit by internal transfer. They can decide within range of Rs.126 to Rs.189.

Situation III

It is assumed that pulp division is having spare capacity of 40000 kg.

If outside supplier reduced the price to Rs.177 then pulp division can also supply internally at this rate since at this it will be able to utilize some contribution also & use spare capacity also.

If pulp division does not agree to supply internally it Rs.177 then it shall have following potential loss

= 10000 kg x (Internal Sale Price of Rs.177 – Variable cost of Rs.126) = Rs.5,10,000

QUESTION 21.

Business Model

Rest Easy Company is a rapidly growing start-up in the technology sector. It develops customized ERP packages for clients across various business sectors. The business comprises primarily of two departments (1) consultant and (2) customer support.

Consultant department has highly qualified professionals from management, accounting, and technology background, who approach clients as a team and work out solutions that meet their needs. Customer support personnel are in charge of IT implementation and provide support through telephone, e-mail or on-site. Currently, the strength of the consultant's department is 200 while that of customer support is 150.

Yash, the founder and CEO of the company, is very passionate about this business model. To deliver high-quality product solutions, he believes that his staff should be well-trained and upto-date with developments in their professional fields. Therefore, Rest Easy provides periodic training to its staff in-house. All employees are expected to undergo 2 weeks of training annually. A training department has been set up with qualified trainers in various fields, who provide periodic training sessions to both Consultant and Customer Service departments. The training department has 5 trainers. Training sessions are aimed at providing skills that the executives need to provide better service to their clients. This in-house focus of high-quality delivery, is the key factor that Yash believes would set apart Rest Easy from its competitors.
In addition to delivering training sessions, trainers are responsible for developing training material for routine, on-going as well as specialized training sessions. They attend conferences, train the trainer sessions and subscribe to journals to keep themselves up-todate with various developments that consultants and customer support executives need to be aware of.
At the beginning of each year, heads of consultant and customer service departments advise the training department on the expected number of training sessions that their staff would undertake. In special situations, where developments need to be communicated rapidly, extra sessions can also be conducted. Training department budgets are prepared based on these needs.

Transfer Pricing - Training Cost Allocation
Cost incurred by the training department is allocated to the consultant and customer service department based on the training sessions availed by both departments. A standard quote (transfer price) based on budgets is provided at the beginning of the year. At the end of the year, actual cost is allocated based on actual training sessions of each department.

Each of the user departments use the transfer price to prepare their individual budgets, that further gets built into their pricing models used for billing clients. One of the metric for manager appraisal is also the financial performance of their individual departments. Hence, managers of both consultant and customer service departments are very cost conscious.

Figures for budget and actual costs for 2018 of the training department are as follows: **Figures in ₹**

Cost Particulars	Budget	Actual
Salaries	25,00,000	30,00,000
Depreciation on Office Equipment	2,00,000	5,00,000
Software Licenses for Training Packages	80,000	1,05,000
Conference Travel for Train the Trainer Sessions	10,000	15,000
Telephone	20,000	25,000
Training Supplies	50,000	60,000
Trainee Lunch	100,000	120,000
Total Expenses	29,60,000	38,25,000

Consultant and Customer service departments are charged based on the number of training sessions actually availed. Details of training sessions for each department are:

Department	Budget	Actual
Consultant	100	100
Customer Service	100	80
Total	200	180

Problem of Goal Congruence

In accordance with the above explanation, the training department quoted a rate of ₹14,800 per session based on the budgeted cost and budgeted training sessions. (Budgeted cost ₹29,60,000 for 200 training sessions). Actual cost per session is ₹21,250 (Actual cost ₹38,25,000 for 180 training sessions). Cost overrun of ₹6,450 per session, a jump of 44% from the original quote. Consequently, a meeting was called that was attended by the managers of consultant, customer service and training departments, along with the CEO Yash. The user departments were unhappy with the higher charge. Manager of the consultant department raised the following concerns:

(a) The market rate for similar trainings provided by external vendors was only ₹12,000 per session. He has accepted a higher transfer price of ₹14,800 per session only because the in-house training program was more customized towards Rest Easy's end-userclients. However, if the department is actually going to be charged ₹ 21,250 per session, he would rather source the training to the outside vendor.

(b) Further, he pointed out that while his department had adhered to its commitment of 100 training sessions, the customer service department has availed of 20 lesser sessions than its commitment. Reviewing the cost structure of the training department, most of the expenses are fixed in nature. Therefore, when the transfer price is based on the actual cost and actual training sessions, the per session cost has increased because the customer service department did not undergo the entire 100 sessions. He questions, why he should bear a higher allocation of cost due to variance in actual and budgeted usage of training resources of the customer service department?

Manager of the customer service department explained that the variance of 20 training session is on account of the executives handling high-priority work pressure that did not allowthem enough time to complete some of the training sessions. At the same time, she contended that she should not be charged for those 20 sessions for which no training was availed.
Manager of the training department explained that the ₹500,000 cost overrun on salary due to new hire of a trainer. The trainer's experience is very valuable to the company and hence to get her on board, the company had to offer a higher pay scale. Depreciation on office equipment was higher by ₹300,000 due to higher replacement cost of ageing equipment. A specialized software license resulted in an excess spend of ₹25,000. The manager argued that the rest of the expenses were normal increases which were not controllable.
Yash, the CEO, was understandably not happy with the cost over-run. Higher internal transfer price to the end user departments would affect employee morale. However, even though a cheaper option was available from an outside vendor, he could still foresee the value of investing in in-house training programs. Intangible benefits from these customized sessions, would definitely help the company's growth.
To conclude, he was not willing to shut down the training department. At the same time, he had to resolve the dispute resulting from internal transfer pricing in an amicable way. Like profits, teamwork is critical to success.

Required

(i) IDENTIFY the threats to goal congruence due to internal transfer pricing.

(ii) During the meeting, an alternate transfer pricing methodology based on two-part pricing system was formulated. Costs would be segregated into fixed and variable categories. A transfer price for each category would be arrived based on budgeted costs and budgeted usage. The standard rate for fixed cost will be applied to the budgeted training sessions and charged to the user departments. The standard rate for variable cost will be applied to the actual training sessions and charged to the user departments. Fixed cost would be defined as those that are not directly impacted by the number of training sessions. CALCULATE the transfer price to be charged to each department under this method.

(iii) EVALUATE how the two-part pricing price method of transfer pricing address the threats to goal congruence as identified in question 1?

ANSWER :-

(i) Threats to goals congruence (Agreement of individual goal to company's goal) due to internal transfer pricing are:

a) Training Department is not much concerned about increase in cost of training department since this cost gets allocated between Consulting & customer service department. This will affect financial position of user departments.

(b) Yash, the CEO is a firm believer of **in-house training** although outside vendors that provide similar service at substantially reduced costs. Higher internal transfer price for training would affect employee morale since they have no control over these allocated costs. Their performance is being evaluated based on uncontrollable factors.

Alternatively, Yash should reconsider his strategy of in-house training. When suitable, training can be sourced to cheaper options available in the market, without compromising on quality.

(c) Most costs of the training department are fixed in nature, as they need to be incurred irrespective of the number of training sessions. These costs are being allocated to the users based on actual training sessions.

In the given problem, internal transfer price has been based on a budget of 200 sessions. Here the customer service department does not adhere to its commitment of 100 training sessions, training sessions actually availed are only 80. Since costs are mostly fixed in nature, the actual cost per training session increases.

Consequently, despite meeting its commitment, **the consultant department** bears a higher cost allocation due to variance in the usage of training resources.

(ii) By segregating the costs into fixed and variable components, Rest Easy is working out two part pricing system for transfer price.
Two-Part Pricing System = Lump-Sum Charge + Variable Cost

To segregate the costs into fixed and variable categories, the criteria is whether the costs change per additional training session. Accordingly, the classification of costs will be as below:

Cost Particulars	Budget (Rs.)	Classification
Salaries	25,00,000	Fixed
Depreciation on Office Equipment	2,00,000	Fixed
Software Licenses for Training Packages	80,000	Fixed
Conference Travel for Train the Trainer Sessions	10,000	Fixed
Telephone	20,000	Fixed
Training Supplies	50,000	Variable
Trainee Lunch	100,000	Variable
Total Expenses	29,60,000	

The lump-sum charge would be based on the fixed cost budget. Marginal cost would be based on the variable cost budget.

Total budget fixed expenses = Rs. 28,10,000 and total budget variable expenses = Rs. 150,000.

Number of training sessions is 200, that is 100 each for consultant and customer service departments. Hence the fixed cost allocation rate would be Rs. 14,050 per session and variable cost allocation rate is Rs. 750 per session.

Transfer price to the consulting department = lump-sum charge + marginal cost

= (Standard Fixed Cost per session × Budgeted Training Sessions) + (Standard Variable Cost per Session × Actual Training Sessions)

= (Rs. 14,050×100) + (Rs. 750×100)

= Rs. 14,05,000 + 75,000

= Rs. 14,80,000.

Transfer price to the customer service department = lump-sum charge + marginal cost

= (Standard Fixed Cost per session × Budgeted Training Sessions) + (Standard Variable Cost per session × Actual Training Sessions)

= (Rs. 14,050 × 100) + (Rs. 750 × 80)

= Rs. 14,05,000 + Rs. 60,000

= Rs. 14,65,000.

Total transfer price allocation is Rs. 29,45,000 versus actual expenses of Rs. 38,25,000.

Unallocated expenses are Rs. 880,000.

(iii) Evaluate how the two-part transfer pricing model would address the goal congruence issues listed in problem 1?

(a) Under this, unallocated expenses of Rs. 880,000 would have to be borne by the training department. As this variance is mainly on account of extra cost for the newly hired trainer and the higher depreciation expense. The department will be more cautious while taking future decisions.

(b) Internal transfer price of Rs. 14,050 per session is still higher than the outside rate of Rs. 12,000 per session. But at the same time, if the number of training sessions are expected to increase beyond the budget, this transfer pricing method charges the user department only a marginal cost of Rs. 750 per session. This is definitely lower that the external rate.

(c) Under this method, fixed expenses are allocated based on budgeted cost and budgeted usage. Variable expense are allocated based on actual training sessions. Hence, any variance in the utilization of training resources, does not impact the other user department. Therefore, most of the goal congruence issues can be addressed through this methodology.

QUESTION 22.

Standard Corporation Inc. (SCI) is a US based multinational company engaged in manufacturing and marketing of Printers and Scanners. It has subsidiaries spreading across the world which either manufactures or sales Printers and Scanners using the brand name of SCI.

The Indian subsidiary of the SCI buys an important component for the Printers and Scanners from the Chinese subsidiary of the same MNC group. The Indian subsidiary buys 1,50,000 units of components per annum from the Chinese subsidiary at CNY (¥) 30 per unit and pays a total custom duty of 29.5% of value of the components purchased.

A Japanese MNC which manufactures the same component which is used in the Printer and Scanners of SCI, has a manufacturing unit in India and is ready to supply the same component to the Indian subsidiary of SCI at ₹320 per unit.
The SCI is examining the proposal of the Japanese manufacturer and asked its Chines subsidiary to presents its views on this issue. The Chinese subsidiary of the SCI has informed that it will be able to sell 1,20,000 units of the components to the local Chinese manufactures at the same price i.e. ¥ 30 per unit but it will incur inland taxes @ 10% on sales value. Variable cost per unit of manufacturing the component is ¥ 20 per unit. The Fixed Costs of the subsidiaries will remain unchanged.

The Corporation tax rates and currency exchange rates are as follows:

Corporation Tax Rates		Currency Exchange Rates
China	25%	1 US Dollar ($) = ₹ 61.50
India	34%	1 US Dollar ($) = ¥ 6.25
USA	40%	1 CNY (¥) = ₹ 9.80

Required

(i) PREPARE a financial appraisal for the impact of the proposal by the Japanese manufacturer to supply components for Printers and Scanners to Indian subsidiary of SCI. [Present your solution in Indian Currency and its equivalent.]

(ii) IDENTIFY other issues that would be considered by the SCI in relation to this proposal.
(Note: While doing this problem use the only information provided in the problem itself and ignore the actual taxation rules or treaties prevails in the above mentioned countries)

ANSWER :-

(i) Impact of the Proposal by the Japanese Manufacturer to Supply Components for Printers and Scanners to the Indian Subsidiary of the SCI.

On Indian Subsidiary of SCI

Particulars	Amount (₹)
Cost of Purchase from the Chinese Manufacturer :	
Invoiced Amount {(1,50,000 units × ¥ 30) × ₹9.80}	4,41,00,000
Add: Total Custom Duty (₹ 4,41,00,000 × 29.5%)	1,30,09,500
Total Cost of Purchase from the Chinese Manufacturer …(A)	5,71,09,500
Cost of Purchase from Japanese Manufacturer in India:	
Invoice Amount (1,50,000 units × ₹320)	4,80,00,000
Total Cost of Purchase from Japanese Manufacturer in India …(B)	4,80,00,000
Savings on Purchase Cost Before Corporate Taxes …(A) – (B)	91,09,500
Less: Corporate Tax @34%	30,97,230
Savings after Corporate Taxes	60,12,270

On Chinese Subsidiary of SCI

Particulars	Amount (₹)
Loss of Contribution [{(1,50,000 – 1,20,000 units) × ¥ (30 – 20)} × ₹9.80]	29,40,000
Add: Inland taxes on Local Sale - Chinese Manufacturer [{(1,20,000 units × ¥ 30) × 10%} × ₹9.80]	35,28,000
Total Loss Before Corporate Taxes	64,68,000
Less: Tax Savings on the Losses (₹64,68,000 × 25%)	16,17,000
Net Loss after Corporate taxes	48,51,000

On SCI Group

Particulars	Amount (₹)
Saving from Indian Subsidiary	60,12,270
Loss from Chinese Subsidiary	48,51,000
Net Benefit to SCI Group	11,61,270

From the above analysis, it can be seen that the proposal from the Japanese manufacturer in India is beneficial for the SCI as it give a net benefit of ₹11,61,270.

(ii) The SCI need to consider various other issues before reaching at a final decision of accepting the proposal of the Japanese manufacturer in India. **The few suggestive issues that should be considered are as follows:**

- The longevity of the proposal of the Japanese manufacturer: Whether Japanese manufacturer will supply the components in the future also. For this purpose, a long term agreement between the Indian Subsidiary of SCI and Japanese manufacturer in India needs to be entered.
- Certainty of the fiscal policy in India: The Japanese manufacturer will not be able to supply the component at the present price if the fiscal policy of India will change in the future.
- Repatriation of Profit earned in India: Though the Indian subsidiary is making profit but it depends on the Government policy on the repatriation of profit from India to USA.
- Operating Conditions in China: The SCI has to make sure that the Chinese subsidiary is operating profitably and able to use the spare capacity in the future as well.
- The fiscal policy in China: If the Government of China liberalize its fiscal policies in China in future then the manufacturing cost will be cheaper than the today's cost.

Apart from above suggestive points the foreign relations and other tax treaties and accords should also be kept in consideration.

QUESTION 23.

Jigyasa India Ltd. (JIL) has 30 retail stores of uniform sizes 'Fruity & Sweety Retails' across the country. Mainly three products namely 'Butter Jelly', 'Fruits & Nuts' and 'Icy Cool' are sold through these retail stores. JIL maintains stocks for all retail stores in a centralised warehouse. Goods are released from the warehouse to the retail stores as per requisition raised by the stores. Goods are transported to the stores through two types of vans i.e. normal and refrigerated. These vans are to be hired by the JIL.

Costs per month of JIL are as follows:

	(₹)
Warehouse Costs:	
Labour & Staff Costs	27,000
Refrigeration Costs	1,52,000
Material Handling Costs	28,000
Total	2,07,000
Head Office Cost:	
Salary & Wages to Head Office Staff	50,000
Office Administration Costs	1,27,000
Total	1,77,000
Retail Stores Costs:	
Labour Related Costs	33,000
Refrigeration Costs	1,09,000
Other Costs	47,000
Total	1,89,000

Average transportation cost of JIL per trip to any retail stores are as follows:

Normal Van	₹3,200
Refrigerated Van	₹4,900

The Chief Financial Manager asked his Finance managers to calculate profitability based on three products sold through Fruity & Sweety retail stores rather than traditional method of calculating profitability.

The following information regarding retail stores are gathered:

	Butter Jelly	Fruits & Nuts	Icy Cool
No. of Cartons per cubic metre (m3)	42	28	40
No. of Items per cartons (units)	300	144	72
Sales per month (units)	18,000	4,608	1,152
Time in Warehouse (in months)	1	1.5	0.5
Time in Retail Stores (in months)	1	2	1
Selling Price per unit (₹)	84	42	26
Purchase Price per unit (₹)	76	34	22

Butter Jelly and Icy-Cool are required to be kept under refrigerated conditions.

Additional information:

Total Volume of All Goods Sold per month	40,000 m^3
Total Volume of Refrigerated Goods Sold per month	25,000 m^3
Carrying Volume of each van	64 m3

Required

CALCULATE the Profit per unit using Direct Product Profitability (DPP) method.

SOLUTION :-

Direct Product Profitability (DPP) Statement **(Amount in ₹)**

	Butter Jelly	Fruits & Nuts	Icy Cool
Selling Price per unit	84.00	42.00	26.00
Less: Purchase Price per unit	76.00	34.00	22.00
Gross Profit …(A)	8.00	8.00	4.00
Direct Product Costs: Warehouse Costs per m3 [W.N.-1]	7.46	2.07	3.73
Retail Stores Costs per m3 [W.N.-2]	6.36	4.00	6.36
Transportation Costs [W.N.-3]	76.56	50.00	76.56
Total DPP costs per m^3	90.38	56.07	86.65
Items per m3 [W.N.-4]	12,600	4,032	2,880
Cost per item …(B)	0.007	0.014	0.030
Direct Product Profit …(A) – (B)	7.993	7.986	3.97

Working Notes

(1) Warehouse Related Costs

	General Costs (₹)	Cost Related with Refrigerated Goods (₹)
Labour & Staff Costs	27,000	---
Refrigeration Costs	---	1,52,000
Material Handling Costs	28,000	---
Total	55,000	1,52,000
Volume of Goods Sold	40,000 m^3	25,000 m^3
Cost per m3 per month	1.38	6.08

Products	Time in Warehouse	Cost per m3 per month (₹)	Total Cost (₹)
Butter	1 Month	7.46 (1.38 + 6.08)	7.46

Jelly			
Fruits & Nuts	1.5 Months	1.38	2.07
Icy-cool	0.5 Months	7.46 (1.38 + 6.08)	3.73

(2) Retail Stores Related Costs

	General Costs (₹)	Cost Related with Refrigerated Goods (₹)
Labour Related Costs	33,000	---
Refrigeration Costs	---	1,09,000
Other Costs	47,000	---
Total	80,000	1,09,000
Volume of Goods Sold	40,000 m^3	25,000 m^3
Cost per m3 per month	2.00	4.36

Products	Time in Retail Stores	Cost per m3 per month	Total Cost
Butter Jelly	1 Month	₹6.36 (₹2.00 + ₹4.36)	₹6.36
Fruits & Nuts	2 Months	₹2.00	₹4.00
Icy-Cool	1 Month	₹6.36 (₹2.00 + ₹4.36)	₹6.36

(3) Transportation Costs

	Normal Van Costs	Refrigerated Van Costs
Cost per trip	₹3,200	₹4,900
Cost per trip	₹3,200	₹4,900
Volume of Van	64 m^3	64 m^3
Cost per m^3 per trip	₹50.00	₹76.56

(4) No. of Items per m^3

Products	No. of Cartons (m3)	No. of Items per Cartons (units)	No. of Items per m3
Butter Jelly	42	300	12,600 (42 × 300)
Fruits & Nuts	28	144	4,032 (28 × 144)
Icy - Cool	40	72	2,880 (40 × 72)

QUESTION 24

History of the Company

Great Bus Tours Co. Ltd. (GBTCL) is an open top double-decker bus sightseeing company, particularly identified with its special red and cream-colored buses. It commenced operating in small town of Meghalaya in June 2014 with four buses and as of 2018 operated over 44 buses in north east region of India. GBTCL operates five routes with stops at tourist destinations. The company runs hop-on, hop-off bus tours of various hills, with one 24-hour ticket valid for unlimited journeys on the route.

Budget Process/ Incentive Plan

As a part of management performance control and incentive scheme it has been following participative budgeting approach. In GBTCL, budgeting is a joint process in which functional divisions develop their plans in conformity with corporate goals for the next financial year. Based on these plans, divisions prepare functional budgets and send to the appropriate management for review and approval. The budgets after the incorporation of the feedback and suggestions received from the said management, are finalised for the implementation. Then, finalised budgets are used as yardstick for performance measurement. Comparing the actual performance with the yardstick, bonus and other performance related incentives are considered. The higher

management believe that this performance control and incentive scheme is very helpful to measure the performance and fixing responsibilities for the responsibility centres.

Budgeted Income Statement (₹'000)

Revenue	1,13,800
Less:	
Variable Costs-	
Direct Material (Fuel, Lubricants and Sundries)	13,600
Direct Labour	40,500
Variable Overheads	7,700
Fixed CostsOperating Overheads (Buses, Garage, Salaries)	18,100
Marketing and Administration	10,700
Profit/ (Loss) before taxes	23,200

Tabel-1
Current Year's Income Statement (₹'000)

Revenue	93,500
Less:	
Variable Costs:	
Direct Material (Fuel, Lubricants, and Sundries)	19,600
Direct Labour	37,700
Variable Overheads	6,200
Fixed Costs:	
Operating Overheads (Buses, Garage, Salaries)	20,150
Marketing and Administration	10,100
Profit/ (Loss) before taxes	(250)

Tabel-2
Other Information
Surprisingly above given current year's actual results were not up to the mark. Actual results were clearly showing adverse performance in comparison with budgeted figures.
Managers of GBTCL were upset because they did not receive the bonus. Ms. Maggie, Tour Manager of Route No. 3, said – "We lost 2 month's revenue and fuel prices are almost doubled. We did our best but these circumstances were beyond our control and we should not penalize at all."

In support of her statement, Ms. Meggie provided following additional information –

(a) Rain is common in Northern Region. But, the past year set a record in numbers. In July, the expected average was 1,577 mm and received was 1,810 mm, In August the expected average rain was 990 mm and actual received was 1,535 mm. Heavy rain in these two months disrupted normal life of the region.
(b) The fuel prices have risen almost continuously since last year due to surge in global crude prices.
(c) Additional operational expenses ₹22,00,000 also incurred to remove the milky appearance and give the stainless a nice new look effected by heavy rain.

She claimed that –
"Revised budget with consideration of the above factors would give different results and lead to different conclusions"

Required

ANALYSE the tour manager's view.

ANSWER :-

Analysis of Issue

- It appears that entity has been badly hit by the weather – high rain in July and August have led to a reduction in business.
- Revenue have seen a fall of 18% approx over the budgeted figure.
- Direct Material (most of the fuel) is 21% approx of the Sales (compared to 12% approx of budgeted level) because of hike in fuel price.

Award of bonus in case of losses is not justified and managers should be held accountable for their operations.

However, they should not be held accountable for the events beyond their control. A manager cannot control movements in fuel price, yet he/ she is supposed to have the most information and he/ she is expected to correctly forecast movements in the prices of fuel. Managers shouldn't be penalized for the uncontrollable events.

Accordingly, in GBTCL, there should be revision in the budget to account uncontrollable events.

Revised Income Statement (Rs.'000)

Revenue (10 Months) (Rs.113800 x 10 Month / 12 Month)	**94,833**
Less:	
Variable Costs-	
Direct Material (most of the fuel) 20.96% approx of the Sales	**19,879**
Direct Labour (40500 x 10 Month / 12 Month)	**33,750**
Variable Overheads (7700 x 10 Month / 12 Month)	**6,417**
Fixed Costs-	
Operating Overheads (Buses, Garage, Salaries) **(18100 + 2200)**	**20,300**
Marketing and Administration	**10,700**
Profit/ (Loss) before taxes	3,787

The Revised Profit Margin has come down to 4% as against the Target Profit Margin of 20%. This clearly indicates that the performance was benchmarked against the higher target. If original budget figure is

used to measure the performance, it will punish employees for the reason which are beyond their control.

GBTCL is not too far away from Revised Profit Margin. Therefore, at least some bonus may be considered to be awarded to the employees which may create more employee loyalty and may be beneficial for long term.

Further, continuous monitoring of Budget Performance (achievement/ failure) in GBTCL is essential to overcome this situation. This helps to identify where revisions are required in the budget to account changing conditions, errors, modification to company's plan etc.

It is also important to note that at the time of revising the budget, the primary budget as well as past information should not be ignored as they are the basis for preparing all budgets.

QUESTION 25

KONY Ltd., based in Kuala Lumpur, is the Malaysian subsidiary of Japan's NY corporation, headquartered in Tokyo. KONY's principal Malaysian businesses include marketing, sales, and after-sales service of electronic products & software exports products. KONY set up a new factory in Penang to manufacture and sell integrated circuit 'Q50X-N'. The first quarter's budgeted production and sales were 2,000 units. The budgeted sales price and standard costs for 'Q50X-N' were as follows:

	RM	RM
Standard Sales Price per unit		50
Standard Costs per unit		
Circuit X (10 units @ RM 2.5)	25	
Circuit Designers (6 hrs. @ RM 2)	12	(37)
Standard Contribution per unit		13

Actual results for the first quarter were as follows:

	RM '000	RM '000
Sales (2,000 units)		158
Production Costs (2,000 units)		
Circuit X (21,600 units)	97.20	
Circuit Designers (11,600 hours)	34.80	(132)
Actual Contribution (2,000 units)		26

The management accountant made the following observations on the actual results –

"In total, the performance agreed with budget; however, in every aspect other than volume, there were huge differences. Sales were made at what was supposed to be the highest feasible price, but we now feel that we could have sold for RM 82.50 with no adverse effect on volume. The Circuit X cost that was anticipated at the time the budget was prepared was RM 2.5 per unit. However, the general market price relating to efficient purchases of the Circuit X during the quarter was RM 4.25 per unit. Circuit designers have the responsibility of designing electronic circuits that make up electrical systems. Circuit Designer's costs rose dramatically with increased demand for the specialist skills required to produce the 'Q50X-N', and the general market rate was RM 3.125 per hour - although KONY always paid below the normal market rate whenever possible. In my opinion, it is not necessary to measure the first quarter's performance through variance analysis. Further, our operations are fully efficient as the final contribution is equal to the original budget."

Required
COMMENT on management accountant's view.

ANSWER :-

Comment
As the management accountant states, and the analysis (W.N.1) presents, the overall variance for the KONI is nil. The cumulative adverse variances exactly offset the favourable variances i.e. sales price variance and circuit designer's efficiency variance. However, this traditional analysis does not clearly show the efficiency with which the KONI operated during the quarter, as it is difficult to say whether some of the variances arose from the use of incorrect standards, or whether they were due to efficient or inefficient application of those standards.
In order to determine this, a revised ex post plan should be required, setting out the standards that, with hindsight, should have been in operation during the quarter. These revised ex post standards are presented in W.N.2.
As seen from W.N.3, on the cost side, the circuit designer's rate variance has changed from adverse to favourable, and the price variance for component X, while remaining adverse, is significantly reduced in comparison to that calculated under the traditional analysis (W.N.1); on the sales side, sales price variance, which was particularly large and favourable in the traditional analysis (W.N.1), is changed into an adverse variance in the revised approach, reflecting the fact that the KONI failed to sell at prices that were actually available in the market.
Further, variances arose from changes in factors external to the business (W.N .4), which might not have been known or acknowledged by standard-setters at the time of planning are beyond the control of the operational managers. The distinction between variances is necessary to gain a realistic measure of operational efficiency.

W.N.1
KONY India Ltd.
Quarter-1
Operating Statement

Particulars	Favourable RM	Adverse RM	RM
Budgeted Contribution			26,000
Sales Price Variance [(RM 79 - RM 50) × 2,000 units]	58,000	---	
Circuit X Price Variance [(RM 2.50 – RM 4.50) × 21,600 units]		43,200	
Circuit X Usage Variance [(20,000 units - 21,600 units) × RM 2.50]		4,000	
Circuit Designer's Rate Variance [(RM 2 - RM 3) × 11,600 hrs.]		11,600	
Circuit Designer's Efficiency Variance [(12,000 hrs. - 11,600 hrs.) × RM 2.00]	800		NIL
Actual Contribution			26,000

W.N.2
Statement Showing Original Standards, Revised Standards, and Actual Results for Quarter 1

Original Standards (ex-ante)			Revised Standards (ex-post)		Actual	
Sales	2,000 units × RM 50.00	RM 1,00,000	2,000 units × RM 82.50	RM 1,65,000	2,000 units × RM 79.00	RM 1,58,200
Circuit X	20,000 units × RM 2.50	RM 50,000	20,000 units × RM 4.25	RM 85,000	21,600 units × RM 4.50	RM 97,200

Circuit Designer	12,000 hrs. × RM 2.00	RM 24,000	12,000 hrs. × RM 3.125	RM 37,500	11,600 hrs. × RM 3.00	RM 34,800

W.N.3
Statement Showing Operational Variances

Particulars	(₹)	(₹)
Operational Variances		16,500 (A)
Sales Price [(RM 79.00 - RM 82.50) × 2,000 units]	7,000 (A)	
Circuit X Price [(RM 4.25 - RM 4.50) × 21,600 units]	5,400 (A)	
Circuit X Usage [(20,000 units – 21,600 units) × RM 4.25]	6,800 (A)	
Circuit Designer Rate [(RM 3.125 - RM 3.00) × 11,600 hrs.]	1,450 (F)	
Circuit Designer Efficiency [(12,000 hrs.– 11,600 hrs.) × RM 3.125]	1,250 (F)	

W.N.4
Statement Showing Planning Variances

Particulars	(₹)	(₹)
Planning Variance		16,500 (F)
Sales Price [(RM 82.50 - RM 50.00) × 2,000 units]	65,000 (F)	
Circuit X Price [(RM 2.50 - RM 4.25) × 20,000 units]	35,000 (A)	
Circuit Designer Rate [(RM 2.00 - RM 3.125) × 12,000 hrs.]	13,500 (A)	

QUESTION 26

T-tech is a Taiwan based firm, that designs, develops, and sells audio equipment. Founded in 1975 by Mr. Boss, firm sells its products throughout the world. T-tech is best known for its home audio systems and speakers, noise cancelling headphones, professional audio systems and automobile sound systems. Extracts from the budget are shown in the following table:

Home Audio System Division
Jan'2019

System	Sales (units)	Selling Price ₹	Standard Cost (per System) ₹
3,000 W PMPO	1,500	18,750	12,500
5,000 W PMPO	500	50,000	26,250

The Managing Director has sent you a copy of an email he received from the Sales Manager 'K'. The content of the email was as follows:
"We have had an outstanding month. There was an adverse Sales Price Variance on the 3,000 W PMPO Systems of ₹22,50,000 but I compensated for that by raising the price of 5,000 W PMPO Systems. Unit sales of 3,000 W PMPO Systems were as expected but sales of the 5,000 W PMPOs were exceptional and gave a Sales Margin Volume Variance of ₹23,75,000. I think I deserve a bonus!"
The managing Director has asked for your opinion on these figures. You got the following information:

Actual results for Jan' 2019 were:

System	Sales (units)	Selling Price ₹
3,000 W PMPO	1,500	₹17,250
5,000 W PMPO	600	₹53,750

The total market demand for 3,000 W PMPO Systems was as budgeted but as a result of suppliers reducing the price of supporting UHD TV System the total market for 5,000 W PMPO Systems raised by 50% in Jan'2019.
The company had sufficient capacity to meet the revised market demand for 750 units of its 5,000 W PMPO Systems and therefore maintained its market share.

Required

(i) CALCULATE the following Operational Variances based on the revised market details: - Sales Margin Mix Variance - Sales Margin Volume Variance

(ii) COMMENT briefly on the measurement of the K's performance.

ANSWER :-

(i) Statement Showing Sales Margin Mix Variance

System	Standard Margin per unit (₹)	Actual Qty. (units)	Revised Actual Quantity (units)	Difference (₹)	Variance (₹)
3,000 W PMPO	6,250	1,500	1,400	+100	+6,25,000 (F)
5,000 W PMPO	23,750	600	700	-100	23,75,000 (A)
Total		2,100			17,50,000 (A)

Statement Showing Sales Margin Volume Variance

System	Standard Margin per unit (₹)	Actual Qty. (units)	Budgeted Quantity (units)	Difference (₹)	Variance (₹)
3,000 W PMPO	6,250	1,500	1,500	0	-
5,000 W PMPO	23,750	600	750	-150	35,62,500 (A)
Total		2,100			35,62,500 (A)

(ii) A Planning Variance simply compares a revised standard (that should or would have been used if planners had known in advance what was going to happen) to the original standard. A planning variance is considered as not to be controllable by management.
The market size is not within the control of the sales manager and therefore variances caused by changes in the market size would be regarded as planning variances.
However, variances caused by changes in the selling prices and consequently the selling price variances and market shares would be within the control of the sales manager and treated as operating variances.
The market size variance compares the original and revised market sizes. This is unchanged for 3,000 W PMPO Systems so the only variance that occurs relates to the 5,000 W PMPO Systems and is ₹59,37,500 (F) [250 systems × ₹23,750].
It is vital to make this distinction because as can be seen from the scenario the measurement of the 'K''s performance is incomplete if the revised market size is ignored.
The favourable volume variance of ₹23,75,000 referred to in the 'K''s e-mail is made up of two elements, one of which, the market size, is a planning variance which is outside his control. It is this that has caused the overall volume variance to be favourable, and thus 'K' is not responsible for the overall favourable performance.

Question 27

Cool Air Private Ltd. manufactures electronic components for cars. Car manufacturers are the primary customers of these products. Raw material components are bought, assembled and the electronic car components are sold to the customers.

The market demand for these components is 500,000 units per annum. Cool Air has a market share of 100,000 units per annum (20% market share) for its products. Below are some of the details relating to the product:

Selling Price	Rs. 2500 per unit
Raw material cost	Rs. 900 per unit
Assembly & machine cost	Rs. 500 per unit
Delivery cost	Rs. 100 per unit
Contribution	Rs. 1000 per unit

The customers due to defects in the product return 5,000 units each year. They are replaced free of charge by Cool Air. The replaced components cannot be repaired and do not have any scrap value. If these defective components had not been supplied, that is had the sale returns due to defective units been nil, customers' perception about the quality of the product would improve. This could yield 10% increase in market share for Cool Air, that is demand for its products could increase to 150,000 units per annum.

Required

(i) ANALYZE, the cost of poor quality per annum due to supply of defective items to the customers.

(ii) The company management is considering a proposal to implement an inspection process immediately before delivery of products to the customers. This would ensure nil sales returns. The cost of having such a facility would be Rs.2 crores per annum, this would include materials and equipment for quality check, overheads and utilities, salaries to quality control inspectors etc. ANALYZE the net benefit, if any, to the company if it implements this proposal.

(iii) Quality control investigations reveal that defective production is entirely on account of inferior quality raw material components procured from a large base of 30 suppliers. Currently there is no inspection at the procurement stage to check the quality of these materials. The management has a proposal to have inspectors check the quality control at the procurement stage itself. Any defective raw material component will be replaced free of cost by the supplier. This will ensure that no product produced by Cool Air is defective. The cost of inspection for quality control (materials, equipment, salaries of inspectors etc.) would be Rs.4 Crores per annum. ANALYZE the net benefit to the company if it implements this proposal?

Please note that scenarios in Problem (ii) and (iii) are independent and not related to each other.

(iv) Between inspection at the end of the process and inspection at the raw material procurement stage, ADVISE a better proposal to implement (a) in terms of profitability and (b) in terms of long term business strategy?

Answer

(i) Statement showing cost of poor quality

Particulars	Amount (Rs.)
Cost of 5,000 units produced to replace free of cost against defective goods 5000 units x (Rs.900 + Rs.500 + Rs.100)	75,00,000
Contribution lost on 50000 units for which company is not getting order due to defective units 50,000 units x Rs.1000 per unit	500,00,000
Total Cost of poor Quality	**575,00,000**

(ii) Please note that proposal would ensure that "Defective goods are not delivered to customer" it means **company is still making 5000 defective units** hence this proposal would save delivery cost on these 5000 units. Another benefit is that company will be able to make sale of additional 50000 units since defective units delivered to customer is NIL hence company will earn contribution on it.

Statement showing Cost-benefit analysis

Particulars	Amount (Rs.)
Saving of Delivery Cost of 5,000 units produced to replace free of cost 5000 units x (Rs.100)	5,00,000
Extra Contribution 50000 units 50,000 units x Rs.1000 per unit	500,00,000
Total benefit	**505,00,000**
Less Cost of Proposal	200,00,000
Net benefit	305,00,000

Analysis

Company should implement the proposal.

Dispute to The Answer in ICAI SM

- Earlier company was making 100000 units and 5000 units were defective. It means 5% defective units are produced.
- Now company will be able to identify defective products even before delivery to customer hence company will save delivery cost i.e. 5000 units x Rs.100 i.e. Rs.5 Lakh. This 5 Lakh rupees has been considered by ICAI in its solution
- But ICAI is not considering impact of 5% defective units on 150000 units

Alternative solution According to CA Purushottam Aggarwal

W. Note 1 – Statement showing Old Contribution Earned on Selling 100000 units

Particulars	Amount (Rs.)
Sales (100000 units x Rs.2500 Per unit)	2500 Lakh
Less Variable cost to Manufacture	

100000 units x Rs.1500	(1500 Lakh)
5000 units x Rs.1500 (Again Produced to Replace Free of Cost)	(75 Lakh)
Old Contribution	925 Lakh

W. Note 2 – Statement showing New Contribution Earned on Selling 150000 units

Pl Note Defective % will still be 5% which is ignores by ICAI in its answer

Particulars	Amount (Rs.)
Sales (150000 units x Rs.2500 Per unit)	3750 Lakh
Less Variable cost to Manufacture	
Produced 150000 units but dispatched only 95% since 5% defective recognized in factory itself (142500 units x Rs.1500 p.u.)	(2137.50 Lakh)
Defective 5% shall not be dispatched but other cost already incurred (7500 units x Rs.1400 [Other than Delivery Cost])	(105 Lakh)
5% Defective need to produce again to deliver. Now again incurred production cost along with delivery cost. (7500 units x Rs.1500)	(112.50 Lakh)
New Total Contribution	1395 Lakh

Now we will make statement showing cost benefit analysis

Particulars	Amount (Rs.)
New Total Contribution	1395 Lakh
Less Old Total Contribution	(925 Lakh)
Less Cost of Improvement	(200 Lakh)
New Total Contribution	**270 Lakh**

Analysis

Company should implement the proposal.

(iii) Since company will ensure quality control over material hence no defective shall get produced. It means company will save all cost incurred on making additional 5000 units. It will also earn contribution on selling additional 50000 units.

Statement showing Cost-Benefit Analysis

Particulars	Amount (Rs.)
Saving in Cost of 5,000 units produced to replace free of cost 5000 units x (Rs.900 + Rs.500 + Rs.100)	75,00,000
Extra Contribution 50000 units 50,000 units x Rs.1000 per unit	500,00,000
Total benefit	**575,00,000**
Less cost of proposal	400,00,000

Net Benefit	**175,00,000**

Analysis

Company should implement the proposal

(iv) (a) If company implement the proposal of inspection of defective goods before delivery of goods to customer then company will get net benefit of Rs.3.05 Crore. If company implement the proposal to check raw material quality then company will get a benefit of Rs.1.75 Crore. Hence from profitability point of view, company should implement proposal to inspection of defective goods before delivery of goods to customer

(b) if company chooses to implement proposal of inspection of defective goods before delivery of goods to customer then it has following limitations

- Defective production will keep on producing.

If company chooses to implement proposal to check raw material quality then following are non-financial points

- Defective production shall stop
- Optimal utilization of resources will happen
- It will ensure ZERO Defect Policy

To ensure 0% defective policy, company need to incur additional 1.30 Crore (3.05 Crore – 1.75 Crore) hence from long term perspective, 2nd proposal should be implemented.