

Question No.1 is compulsory.

Answer any **four** questions from the remaining **five** questions.

Working notes should form part of the answer.

**Question 1**

**( 20 Marks)**

Amber Ltd. is a leading company in the Footwear Industry. The company has four factories in different locations with state of the art equipments. Due to competition in the market, company is continually reviewing its product range and enhancing its existing products by developing new models to satisfy the demands of its customers.

The company currently has a production facility which has a capacity of 3,500 standard hours per week.

Product 'Comfort' was introduced to the market six months ago and is now about to enter the maturity stage of its life cycle.

However, research by the marketing department indicates that demand of the product 'Comfort' in the market is price sensitive. The likely market responses are as follows:

Selling price per unit (Rs.)	1,750	1,600	1,525	1,450	1,300
Sales demand per week (units)	550	725	1,000	1,150	1,200

The variable cost per unit of manufacturing 'Comfort' is Rs. 750.

Standard hours used to manufacture one unit is 2 hours.

Product 'Sports' was introduced to the market two months ago using a penetration pricing policy and is now about to enter its growth stage. Each unit has a variable cost of Rs. 545 and takes 2.50 standard hours to produce. Market research has indicated that there is a linear relationship between its selling price and the number of units demanded, of the form  $P = a - bx$ . At a selling price of Rs. 1,000 per unit demand is expected to be 1,000 units per week. For every Rs. 100 increase in selling price the weekly demand will reduce by 200 units and for every Rs. 100 decrease in selling price the weekly demand will increase by 200 units.

Product 'Ethnic' is currently being developed and which is about to be launched in the market. This is a highly innovative designer product which the company believes that it will have a revolutionary impact on the market and consumer behaviour. The company has decided to use a market skimming approach to pricing this product during its introduction stage.

**Required**

- (a) (i) ADVISE which of the above five selling prices should be charged for product 'Comfort', in order to maximize its contribution during its maturity stage. **(3 marks)**

- (ii) CALCULATE the number of units to be produced of product 'Sports' in order to utilize all of the spare capacity from your answer to (i) above and the selling price per unit of product 'Sports' during its growth stage. **(2 + 3 = 5 marks)**
- (b) COMPARE penetration and skimming pricing strategies during the introduction stage, using product 'Ethnic' to illustrate your answer. **(4 marks)**
- (c) EXPLAIN with reasons, for each of the stages of 'Ethnic's product life cycle, the changes that would be expected in the
- (i) average unit production cost
  - (ii) unit selling price
- (4 + 4 = 8 marks)**

**Question 2(A)**

**(10 Marks)**

APC Ltd. has two divisions- Division X and Division Y with full profit responsibility. Division X produces components 'Gex' which is supplied to both division Y and external customers.

Division Y produces a product called 'Gextin' which incorporates component 'Gex'. For one unit of 'Gextin' two units of component 'Gex' and other materials are used.

Till date, Division Y has always bought component 'Gex' from division X at Rs. 50 per unit since the lowest price at which the component 'Gex' could have been bought by Division Y was Rs. 52 per unit.

Division X charges the same price for component 'Gex' to both division Y and external customers. However, it does not incur selling and distribution costs when transferring internally.

Division Y has received a proposal from a new supplier who has offered to supply component 'Gex' for Rs. 47 per unit at least for the next three years.

Manager of Division Y requests the manager of Division X to supply component 'Gex' at or below, Rs. 47 per unit. Manager of Division X is not ready to reduce the transfer price since the divisional performance evaluation is done based on profit margin ratio of the division.

The following additional information is made available to you :

	Component 'Gex'Rs.	Product 'Gextin'Rs.
Selling Price per unit	50	180
Less: Variable Costs		
Direct Materials		
Component 'Gex'	-	100
Other materials	12	22
Direct labour	16	13
Manufacturing Overhead	2	5
Selling and Distribution Costs	4	2
Contribution per unit	16	38
Annual fixed costs	Rs. 40,00,000	Rs. 20,00,000
Annual external demand (units)	3,00,000	1,20,000
Capacity of plant (units)	5,00,000	1,50,000

**Required**

- (i) CALCULATE the present profit of each division and the company as a whole. **(2 Marks)**
- (ii) ANALYSE the impact on the total annual profits of each division and the company as a whole if Division Y accepts the offer of the new supplier. **(4 Marks)**

- (iii) In the changed scenario, DISCUSS why the top management should intervene and advise a suitable transfer price for component 'Gex' for resolving transfer pricing conflict which promotes goal congruence through efficient performance of the concerned division. **(4 Marks)**

**Question 2(B)**

**(10 Marks)**

A Company manufactures a single product, which requires three components. The company purchases one of the components from three supplier. DJ Ltd., PJ Ltd. and ZJ Ltd. The following informations are available:

	DJ Ltd.	PJ Ltd.	ZJ Ltd.
Price quoted by supplier (per hundred units)	Rs. 240	Rs. 234	Rs. 260
% of Defective of total receipts	3%	5%	2%

If the defectives are not detected they are utilized in production causing a damage of Rs. 200 per 100 units of the component. Total requirements is 12,000 units of the components.

The company intends to introduce a system of inspection for the components on receipt. The inspection cost is estimated at Rs. 26 per 100 units of the components. Such as inspection will be able to detect only 90% of the defective components received. No payment will be made for components found to be defective in inspection.

**Required**

- (i) ADVICE whether inspection at the point of receipt is justified. **(8 Marks)**  
 (ii) Which of the three supplier should be asked to supply? **(2 Marks)**

**Question 3**

**(20 Marks)**

AKG Limited has three autonomous divisions. The divisions are evaluated on the basis of ROI, with year end bonuses given to divisional managers who have the highest ROI. Operating results of Division II for the last year are given below:

	Rs.
Sales	2,10,00,000
Less: Variable Expenses	1,26,00,000
Contribution margin	84,00,000
Less: Fixed Expenses	67,20,000
Net Operating Income	16,80,000
Divisional Operating Assets	52,50,000

The company's overall ROI for the last year was 18% (considering all divisions). Division II has an opportunity to add a new product line that would require an investment of Rs. 30,00,000. Other details of the new product line are as follows:

	Rs.
Sales	Rs. 90,00,000 per annum
Variable Expenses	65% of sales
Fixed Expenses	Rs. 25,20,000 per annum
Life cycle of the product line	5 years

Though Division II is performing well, but many a times, the customers complained that they had to wait for long after placing the orders. The company is interested in cutting the amount of time between when a customer places an order and when the order is completed. For the last year, the following data were reported in respect of Division II:

- Inspection time = 0.5 days per batch
- Process time = 2.8 days per batch
- Wait time = 16.0 days per batch
- Queue time = 4.0 days per batch
- Move time = 0.7 days per batch

In addition to financial performance measures, the company wishes to introduce a variety of non-financial performance measures.

The company has set aggressive targets in both sales growth and ROI for the coming year. The company's strategy for achieving these goals includes a campaign aimed at building brand recognition, customer retention, improvement in product quality, on time delivery to customers, expansion of eco-friendly product line and introduction of limited edition items.

**Required:**

- (a) (i) CALCULATE last year's ROI of Division II. **(1 Mark)**
- (ii) DISCUSS whether the manager of Division II would accept or reject the new product line, if he takes his decision based solely on divisional ROI. **(2 Marks)**
- (iii) ADVISE how residual income approach can be used as an alternative financial measure for evaluation of managerial performance in the best interest of the company. **(2 Marks)**
- (iv) CALCULATE Manufacturing Cycle Efficiency (MCE) and interpret the result. **(3 Marks)**
- (v) STATE what percentage of the production time is spent in non-value added activities. **(1 Mark)**
- (vi) CALCULATE the delivery cycle time. **(1 Mark)**
- (vii) CALCULATE the new MCE if by using Lean Production all queue time can be eliminated. **(2 Marks)**
- (b) Based on the above information and using a Strategy Map TABULATE two objectives and two measures for each perspective across the four dimensions of a balanced scorecard in the following format :

Perspective	Strategic Objective	Measure

**(8 Marks)**

**Question 4(A)****(10 Marks)**

Raju is Chief Financial Officer of Millets. com, an internet company that enables customer to order for delivery of different millets by accessing its website. Raju is concerned with the efficiency and effectiveness of the financial function. He collects the following information for three finance activities in 2018.

**Rate per unit of Cost Driver**

Activity	Activity level	Cost Driver	Static Budget Amount (Rs.)	Actual Amount (Rs.)
Receivables	Output unit	Remittance	6.39	7.50
Payables	Batch	Invoices	29.00	28.00
Travel expenses	Batch	Travel claims	76.00	74.00

The output measure is the number of deliveries which is the same as the number of remittances. The following additional information are also given:

	Budgeted	Actual
Number of deliveries	10,00,000	9,48,000
Delivery Batch size	5	4.468
Travel expenses Batch size	500	501.587

**Required**

CALCULATE the flexible budget variances for 2018 to :

- (i) Receivable Activities **(2 Marks)**
  - (ii) Payable Activities **(4 Marks)**
  - (iii) Travel expense Activities **(4 Marks)**
- (Ignore fractions in all calculations)

**Question 4(B)****(10 Marks)**

Cool Air Ltd., manufactures and sells 25,000 table fans annually. One of the components required for fans is purchased from an outside supplier at a price of Rs. 190 per unit. Annually it is purchasing 25,000 components for its usage. The Production Manager is of the opinion that if all the components are produced at own plant, it is possible to maintain better quality in the finished product. Further, he proposed that the in-house production of the component with other items will provide more flexibility to increase the annual production by another 5,000 units. He estimates the cost of making the component as follows:

	Rs. per unit
Direct materials	80
Direct labour	75
Factory overhead (70% variable)	40
Total Cost	195

The proposal of the Production Manager was referred to the Marketing Manager for his remarks. He pointed out that to market the additional units, the overall unit price should be reduced by 5% and additionally Rs. 1,00,000 p.m. should be incurred for advertising. Present selling price and contribution per fan are Rs. 2,500 and Rs. 600 respectively. No other increase or decrease in all other expenses as a result of this proposal will arise.

Since the making cost of the component is more than the buying cost, **the Management asks you to:**

- (i) ANALYSE the make or buy decision on unit basis and total basis. **(8 Marks)**
- (ii) RECOMMEND the most profitable alternative. **(2 Marks)**

**Question 5(A)****(10 Marks)**

APZ Company Ltd. manufactures spare parts and can be called "high volume based" manufacturing environment. The company is using the system of Total Productive Maintenance for maintaining and improving the integrity of manufacturing process. There are several different automated manufacturing machines located in the plant, through which manufacturing of spare parts are done and supplied to cater the demand in the market.

A 12 hour shift is scheduled to produce a spare part in APZ Company Ltd. as shown in the schedule below. The shift has three 15 minute breaks and a 10 minute clean up period.

**Production Schedule for Automated machine A 10:**

Cycle: 10 (seconds),

Spare parts Manufactured: 3,360,

SCRAP: 75,

Unplanned Downtime: 36 minutes

**Required**

- (i) CALCULATE OEE (Overall Equipment Effectiveness) and comment on it. **(6 Marks)**
- (ii) The management of company has decided to ensure that things are done right the first time and that the defects and waste are eliminated from operations. Thus, they are planning to implement Total Quality Management (TQM) also. SUMMARIZE the connection between Total Quality Management (TQM) and Total Productive Maintenance (TPM). **(4 Marks)**

**Question 5(B)****(10 Marks)**

RK Ltd., which is producing a product, prepared a budget for the next year as follows :

Fixed Cost p.a ..... Rs. 12,60,000

Variable Cost p.u... .....Rs. 25

Production..... 1,80,000 units

Selling price - Cost plus 25% mark up on total budgeted cost

When these budgeted figures and the pricing approach were informed to the Marketing Manager, he came out with a remark that the demand for the product is more price sensitive and he expected the demand under various prices as given below:

Selling Price p.u. (Rs.)	36	38	40	42	44
Annual Demand (units)	1,74,000	1,62,000	1,50,000	1,38,000	1,25,000

The Marketing Manager further informed that a wholesale dealer is ready to buy the entire production of the company at a price of Rs. 32 p.u. In that situation he expected a savings of Rs. 2 p.u. in the selling expenses which are a part in the above stated variable cost.

**Required**

EVALUATE the situation and advice the most profitable course of action.

**Question 6(A)****(5 Marks)**

A chemical company produces two chemicals SX and ZX. Environmental activities and costs associated with the two chemicals are as follows :

	<b>SX</b>	<b>ZX</b>
Unit produced (kg.)	6,00,000	15,00,000
Packing Materials (kg.)	80,000	40,000
Energy Usage (KWH)	60,000	30,000
Toxin releases (Pounds into air)	2,00,000	40,000
Pollution control machine hours	32,000	8,000

Cost of environmental activities :	
Packing material Costs	Rs. 3,60,000
Energy Costs	Rs. 96,000
Fines for release of toxins into air	Rs. 48,000
Operating costs of pollution control equipments	Rs. 1,12,000

**Required**

CALCULATE the environmental cost per kilogram for each chemical produced by the company.

**Question 6(B)****(5 Marks)**

The triple bottom line recognises that a company's performance should not only be viewed in terms of its ability to generate economic profits for its owners, but also by its impact on people and the planet for its long term economic and social viability. XYZ Limited has recently undertaken initiatives towards sustainability as below :

- i. Reduced the amount of plastic usage in the peanut butter jars.
- ii. Provided financial support to hospital run by local authority in the vicinity of the factory.
- iii. Constructed solar powered warehouse.
- iv. Generate profit for the company's shareholders.
- v. Started child care unit for the benefit of women employees as well as for the neighborhood community.

**Required**

IDENTIFY whether this initiative would primarily impact people, planet or profit.

**Question 6(C)****(10 Marks)**

Apple Ltd., is following three variances method to analyse and understand production overhead variances. The three variances for a particular year were reported as given below:

	Rs.
Production overhead expenditure variance	94,000 A
Production overhead volume variance	1,00,000 F
Production overhead efficiency variance	48,000 F

The other particulars furnished from the records of the company are :

Standard machine hours for the year	11,500
Closing balance in the Production Overhead Control Account	Rs. 18,00,000
Fixed overhead rate per hour	Rs. 125
Variable overhead rate per hour	Rs.80

**Required**

COMPUTE the following by considering the additional information also :

- (i) Actual machine hours
- (ii) Budgeted machine hours
- (iii) Total Fixed Production Overhead amount
- (iv) Applied Production Overhead amount

**Additional Information**

- Expenditure variance was computed totally for fixed and variable overheads.
- Volume variance is applicable to fixed overhead only.
- Efficiency variance is applicable only to variable overhead and fixed overhead efficiency variance was already included in volume variance.