

Roll No.

Total No. of Questions – 10

Total No. of Printed Pages – 16

Time Allowed – 3 Hours

Maximum Marks – 100

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Answers to questions are to be given only in English except in the case of candidates who have opted for Hindi Medium. If a candidate has not opted for Hindi Medium, his/her answers in Hindi will not be valued.

Question No. 1 is compulsory

Candidates are also required to answer any **four** questions from the remaining **five** questions.

Working notes should form part of the answer.

No statistical or other table will be provided with this question paper.

1. Cure Hospital is running under private-public-partnership (PPP) model-providing treatment for non-communicable diseases. ABCO Hospitals Limited is the private partner which runs a chain of hospitals on profit basis in major cities in India. The public partner is the State Government. Cure Hospital is a "not-for-profit" hospital.

Private partner is to invest in upgrading and equipping the facility and responsible for operational management and service delivery. Government to provide physical space and other infrastructure in "as is where is" condition, provide support facilities and hospital amenities. Private partner assumes the entire responsibility for a full range of investment, operation and maintenance functions. Private partner has the authority to make daily management decisions.

EGY

P.T.O.

The hospital is funded to a great extent by the State Government and a fixed level of funding is received from the government each year out of the State budgetary allocation. It is up to the hospital to allocate this fund to different areas such as doctors' and other staff salaries, medicines and all other costs required to run a hospital.

Cure Hospital's objectives are :

- to give prompt access to high quality medical treatment for patients.
- to provide free treatment to poor patients in line with government policy of inclusive development.
- to provide value for money for the taxpayer-measured by the 3 Es framework of Economy, Efficiency and Effectiveness.
- to contribute to medical science by developing innovative ways to deliver treatment to patients.

Except select surgeries, all services are free for poor patients that are below poverty line (BPL) card holders. 40% beds are reserved for poor patients. Free out patient department (OPD) services to poor. CT Scan and MRI diagnostics are free for poor patients, subsidised rates for others. Cure Hospital also runs a generic medicine shop inside the hospital premises which sells medicines to all patients at discount ranging from 40% to 56% - the only shop of this kind in the city.

WHO has agreed to provide financial and technical support to the neonatal care unit. The hospital enabled it to obtain five accreditation certificates from various leading authorities on different aspects of hospital management.

Feedback is taken from each in-patient about the quality of service provided by the hospital and the satisfaction level is taken in 1 to 10 point scale. 1 being the least satisfied and 10 represents totally satisfied.

In a recent meeting of the managing committee of the hospital, discussions were held about inadequate performance measurement systems in place to assess whether the hospital is achieving its objectives and that insufficient attention is given to the importance of non-financial performance indicators. A four member team consisting of a performance management expert and three senior doctors was created to give their advice in these aspects.

The four member team met with doctors, staff and other stakeholders at length and breadth. Some of the conversations were as below :

Doctor A : I think the hospital always delivers value for money. We have always achieved our total financial budgets.

Doctor B : We work here much longer hours than doctors in other hospitals, often without being paid for working overtime.

Doctor C : There is not enough government and private partner funding to recruit more doctors and paramedic staff.

Doctor D : Number of out-patients has increased considerably. Earlier an out-patient had to wait for an average period of 2 hours 20 minutes and now the same has increased to 3 hours.

Senior Doctor K : I do not know how much time we spend developing innovative ways to deliver treatment to patients though, as most of the performance data we doctors receive relates to financial targets.

In-patient H : Incompetent paramedic staff, poor quality of food and bed linen.

Staff M : Management undermines our role in running the hospital.

(4)

EGY

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Recent performance data of the hospital vis-a-vis national average are as follows :

	Cure Hospital	National average of other PPP run hospitals
Number of doctors	80	76
Average doctors' salaries per month including overtime	₹ 1,20,000	₹ 1,60,000
Average doctors' salaries including overtime as per budget	₹ 1,20,000	₹ 1,25,000
Number of in-patients treated	8,360	6,369
Average satisfaction rating of in-patients	6	9
Number of patients readmitted for treatment of the same ailment within short period of time after discharge from the hospital	627	128
Average staff satisfaction rating (0% represents totally dissatisfied and 100% represents totally satisfied)	16%	86%
Number of out-patients treated	76,212	63,318

Required :

- (a) Explain why non-financial performance indicators are particularly important to measure the performance of "not-for-profit" organisations such as Cure Hospitals.

4

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(5)

EGY

Marks

- (b) Evaluate whether Cure Hospital is delivering value for money for each of the components of the value for money framework. 12
- (c) The CEO of the hospital intends to introduce a nominal fee for out-patient treatment given to poor patients and remove subsidised rate of CT Scan and MRI diagnostic for other patients in order to achieve its objectives in a better way. Evaluate the proposal of the CEO. 4

2. Pixel Limited is a toy manufacturing company. It sells toys through its own retail outlets. It purchases materials needed to manufacture toys from a number of different suppliers. Recently, due to the entry of few reputed foreign brands in the toy market and particularly in the segment in which Pixel Ltd. is doing business, it is facing a threat to operate profitably.

Each toy requires 4 kg. of materials at ₹ 19 per kg. and 5% of all materials supplied by the suppliers are found to be substandard. Labour hour requirement for each toy is 0.4 hour at ₹ 120 per hour.

Market research has determined that the selling price will be ₹ 240 per toy.

The company requires a profit margin of 15% of the selling price. Expected demand for toy in the coming year will be 50,000 toys. Sales and variable overhead per unit for the four quarters of the year will be as follows:

	Q1	Q2	Q3 (Festive season)	Q4 (Festive season)
Sales (units)	7,500	9,000	15,500	18,000
Variable overhead per unit (₹)	22	22	24	25

Total fixed overheads are expected to be ₹ 6,25,000 for each quarter.

EGY

P.T.O.

(6)

EGY

Marks

The production manager has decided to produce 12,500 units in each quarter. Inventory holding costs will be ₹ 18 per unit of average inventory per quarter. Inventory holding costs are not included in above.

Normal production capacity per quarter is 15,000 toys. The company can produce further up to 6,000 units per quarter by resorting to overtime working. Overtime wages will be at 150% of normal wage rate.

Assume zero opening inventory.

Required :

- (a) (i) Calculate the cost gap that exists between the total cost per toy as per the production plan and the target cost per toy. 9
- (ii) Discuss how just-in-time purchasing and just-in-time production will remove the cost gap calculated in (i) above. Show calculations in support of your answer. 7
- (b) Explain, how implementation of JIT production method can be a major source of competitive advantage and success of the company. 4

3. 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 :

	₹
Sales	2,10,00,000
Less: Variable Expenses	<u>1,26,00,000</u>
Contribution margin	84,00,000
Less: Fixed Expenses	<u>67,20,000</u>
Net Operating Income	<u>16,80,000</u>
Divisional operating assets	52,50,000

EGY

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 ₹ 30,00,000. Other details of the new product line are as follows :

Sales	₹ 90,00,000 per annum
Variable Expenses	65% of sales
Fixed Expenses	₹ 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

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- (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
- (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
- (iv) Calculate Manufacturing Cycle Efficiency (MCE) and interpret the result. 3
- (v) State what percentage of the production time is spent in non-value added activities. 1
- (vi) Calculate the delivery cycle time. 1
- (vii) Calculate the new MCE if by using Lean Production all queue time can be eliminated. 2
- (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 : 8

Perspective	Strategic Objective	Measure

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

	SX	ZX
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

(9)

EGY

Marks

Cost of environmental activities :

Packing material Costs	₹ 3,60,000
Energy Costs	₹ 96,000
Fines for release of toxins into air	₹ 48,000
Operating costs of pollution control equipments	₹ 1,12,000

Required :

Calculate the environmental cost per kilogram for each chemical produced by the company. **5**

OR

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) Generated profit for the company's shareholders.
- (v) Started child care unit for the benefit of women employees as well as for the neighbourhood community.

Required :

Identify whether this initiative would primarily impact people, planet or profit. **5**

EGY

P.T.O.

- (b) The President of Automation Limited, a 150 persons engineering company, decided it was time to fire the company's biggest client. Although the client provided close to 60% of the company's annual revenue, Automation Limited decided that dropping this client was necessary. The client was profitable.

The President of Automation Limited stated "We cannot be a great place to work without employees, and this client was bullying my employees. Its demands for turnaround were impossible to meet even with people working seven days a week. No client is worth losing my valued employees".

The initial impact on revenues was significant. However, Automation Limited was able to cut costs and obtain new customers to fill the void. Moreover, the dropped client later gave Automation Limited two projects on more equitable terms.

Required :

- | | |
|--|---|
| (i) Discuss the reasons behind dropping of a profitable client by Automation Limited. | 2 |
| (ii) State three qualitative factors that management should consider in outsourcing and make or buy decisions. | 3 |
- (c) 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 ₹ 50 per unit since the lowest price at which the component 'Gex' could have been bought by Division Y was ₹ 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 ₹ 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 ₹ 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'	Product 'Gextin'
	₹	₹
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	<u>4</u>	<u>2</u>
Contribution per unit	<u>16</u>	<u>38</u>
Annual fixed costs	₹ 40,00,000	₹ 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 |
| (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 |
| (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 |

5. (a) 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 : 3360,

SCRAP : 75,

Unplanned Downtime : 36 minutes

Required :

(i) Calculate OEE (Overall Equipment Effectiveness) and comment on it. 6

(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. 4

Summarize the connection between Total Quality Management (TQM) and Total Performance Maintenance (TPM).

(b) SPS Limited uses activity based costing to allocate variable manufacturing overhead costs to products. The company identified three activities with the following information for last quarter :

Activity	Standard Rate	Standard Quantity per unit produced	Actual Costs	Actual Quantity
Indirect Materials	₹ 20 per kilogram	0.5 kilogram per unit	₹ 9,40,000	48,000 kilogram
Product Testing	₹ 3 per test minute	10 minutes per unit	₹ 22,50,000	7,40,000 test minutes
Energy	₹ 0.20 per minute of machine time	4 minutes of machine time per unit	₹ 70,000	3,60,000 minutes of machine time

The company produced 80,000 units in the last quarter. Company policy is to investigate all variances above 5% of the flexible budget amount for each activity.

Required :

- (i) Calculate variable overhead expenditure variance and variable overhead efficiency variance for each of the activities using activity based costing. Clearly indicate each variance as favourable or unfavourable / adverse. 6
- (ii) Interpret the results of variable overhead efficiency variance as calculated in (i) above in respect of indirect materials and product testing activity. 2
- (iii) Identify the variances that should be investigated according to company policy. Show calculations to support your answer. 2
6. (a) SEZ Limited produces three products S, Q and L which use the same resources but in varying quantities. Product S uses one unit of component P which is purchased from outside suppliers at ₹ 120 per unit. Details of the three products are as follows : 10

	S	Q	L
Annual Demand (units)	9,000	5,700	7,800
	Per unit	Per unit	Per unit
	₹	₹	₹
Selling Price	310	275	224
Component P	120	—	—
Direct materials (₹ 8 per kg.)	24	32	24
Skilled labour (₹ 40 per hour)	20	60	40
Unskilled labour (₹ 24 per hour)	18	24	36
Variable Overhead (₹ 6 per machine hour)	18	24	24

Annual fixed costs are ₹ 15,00,000.

Maximum availability of skilled labour is 16,200 hours. Other resources are sufficient to meet the annual demand/sales.

Engineering division of the company came forward with a proposal to make the component 'P' in house with the following costs break up :

Direct materials (₹ 8 per kg.)	₹ 24
Skilled labour (₹ 40 per hour)	₹ 40
Unskilled labour (₹ 24 per hour)	₹ 8
Variable Overhead (₹ 6 per machine hour)	<u>₹ 18</u>
	<u>₹ 90</u>

For in-house making of the component 'P' there will not be any change in the annual fixed costs of the company. The company can either buy the component 'P' or make it in house.

Required :

Recommend the optimum production plan and profit for the year. Show calculation in support of your answer.

- (b) SW & Co is a firm of Chartered Accountants having head office at Delhi and four branches in different parts of Northern region. They are providing wide range of services to their esteemed clients. Their core services include Taxation, Corporate Audits, Bank Audits, Management Audits and Project financing. The firm is preparing its budgets for the financial year 2019-2020. 10

The senior partners of the firm have stated that they would like to pay off the firm's loan taken from a public sector bank two years back for

(16)

EGY

the renovation of their office premises this year and to have a positive cash reserve of ₹ 2,00,000 by the end of the year.

While comparing the actual cost with the budgeted data of last year, it was revealed that travelling costs were much higher than the budgeted costs. Fees receivable from some clients were also pending for more than three years thus distorting the expectations of cash budget.

Discuss the differences between feedforward control and feedback control using the above information about the cash budget of SW & Co.

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