

**OPERATIONS MANAGEMENT & STRATEGIC MANAGEMENT**

Time Allowed: 3 Hours

Full Marks: 100

The figures in the margin on the right side indicate full marks.

SECTION – A (Compulsory)**1. Choose the correct option from the four alternatives given:****[15 × 2 = 30]**

- (i) In **ROLN LTD.**, a product manufacturing Company, the question “Are we producing the right things”? can be closely related to:
- (A) Process Selection
 - (B) Inventory Management
 - (C) Maintenance Management
 - (D) Quality Management
- (ii) For Quality Assurance in Design, Production, Installation and Servicing the _____ model is to be used.
- (A) ISO 9002 Model
 - (B) ISO 9001 Model
 - (C) ISO 9003 Model
 - (D) None of the above
- (iii) A Factory of **XONT Ltd.**, has 13 workers producing a single product. The total output in a month of 24 working days is 370 units. What is the monthly productivity per worker?
- (A) 30
 - (B) 28.46
 - (C) 15.42
 - (D) 20
- (iv) The Growth phase of the Product Life Cycle is characterized by:
- (A) Decline in market share and profits
 - (B) Rapid increase in sales and market expansion
 - (C) Withdrawal of the product from the market
 - (D) Lack of promotional activity
- (v) Which of the following phases of Project Management Life Cycle, Signals the official end of the Project and provides a period for reflection, Wrap-up, and organization of materials?
- (A) Execution Phase
 - (B) Project Quality Management
 - (C) Project closure
 - (D) Planning Phase



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- (vi) A Gantt Chart is also known as a _____
- (A) Bar Chart
(B) Flow Chart
(C) Line Graph
(D) “Z” Chart
- (vii) Which of the following is / are the primary Constraint(s) of a Project?
- (A) Quality
(B) Time
(C) Cost
(D) All of the above (A), (B) and (C)
- (viii) The SLACK Time of Head event of Activity-ZB of a Project-ROT is 2 days. If the total Float and Independent float of the Activity-ZB are 10 days and 5 days respectively, the Slack time of Tail event of the same will be _____
- (A) 4 Days
(B) 3 Days
(C) 2 Days
(D) None of these
- (ix) **BXON Ltd.**, produces a Product-XN in its Machine-MB. Its Product-XN has a Mean Time Between Failure (MTBF) of 13.50 hours and has a Mean Time to Repair (MTTR) a Machine of 1.50 hours. What will be the availability of a Machine of Product-XN?
- (A) 80 %
(B) 90 %
(C) 75 %
(D) None of the above
- (x) **POTN Company** has kept records of breakdowns of its Machines for 300 days work a year as shown below:

No. of Breakdown	Frequency in days
1	90
2	150
3	60

If the Company estimates that each breakdown Costs ₹750, What will be the Cost of breakdown per day?

- (A) ₹ 1500
(B) ₹ 1425
(C) ₹ 1348
(D) None of the above



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- (xi) Which of the following Types of Strategy, is about how to Compete Successfully in particular markets?
- (A) Corporate Strategy
 - (B) Business Strategy
 - (C) Functional Strategy
 - (D) Operational Strategy
- (xii) Which of the following organization is associated with the Vision in a brief phase “To make the world more open and connected”?
- (A) Amazon
 - (B) Infosys
 - (C) Facebook
 - (D) Tesla
- (xiii) What does “F” in the FAST goal setting framework stand for?
- (A) Financially Viable
 - (B) Fully achievable
 - (C) Frequently discussed
 - (D) Fully Transparent
- (xiv) Business Environment is _____
- (A) Complex
 - (B) Dynamic
 - (C) Multi-faceted
 - (D) All of the above
- (xv) Which among the following is true?
- (A) BPR has resulted in major gains in efficiency.
 - (B) BPR has resulted in major gains in speed.
 - (C) BPR has resulted in major gains in quality.
 - (D) BPR has resulted in major gains in efficiency, quality and speed.



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Section – B

(Answer any 5 questions out of 7 questions given. Each question carries 14 Marks)

[5 × 14 = 70]

2. (a) “Capacity is the rate of productive capability of a facility” and the effective Capacity is influenced by various factors”. – With reference to this statement Identify the said factors influencing the effective Capacity. [7]

- (b) “A good product design must ensure the various characteristics”. – **In this context, summarise** the said Characteristics of good product design. [7]

3. (a) **ROGEN Ltd.**, a Manufacturing Company is using a Machine whose purchase price is ₹180000. The installation charges amount to ₹ 38000 and the machine has a scrap value of ₹18000 because the firm has a monopoly of this type of work. The maintenance cost in various years is given in the following table:

Year	1	2	3	4	5	6	7	8	9
Maintenance Cost (₹)	2500	7500	12000	18000	24000	31000	42000	52000	63000

Required:

- (i) **Calculate the** average annual Cost of replacement of a machine for each year.
(ii) **Assess and identify** after how many years should the machine be replaced on economic considerations, assuming that the machine replacement can be done only at the year end. [7]
- (b) The following table gives the age of Cars VEE20 of Mahindra make and its Annual Maintenance Cost.

Age of Cars in Years (X)	2	4	6	8
Maintenance Cost (in thousand of ₹ (Y))	20	40	50	60

Required:

- (i) **Fit Linear Regression** of Y on X.
(ii) **Identify the** Maintenance Cost for Age of Cars of 10 years.
(iii) **Identify the** Age of Cars in years for Maintenance cost of ₹ 80000. [7]
4. (a) **MR. SOHAN**, a marketing Manager of **WANCHO Ltd.**, has four Salesmen and four Sales districts. Considering the capabilities of the Salesmen and the nature of districts, Mr. Sohan estimates that sales per month (in thousand Rupees) for each Salesman in each district would be as follows:

Salesman	District			
	P	B	S	T
PS	60	53	46	39
TB	48	43	38	33



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Salesman	District			
	P	B	S	T
RM	48	43	38	33
SB	42	38	34	30

Required:

- (i) **Analyze** and assign the appropriate district to each Salesman to maximize the Sales.
- (ii) **Calculate** the Total Sales (₹ in thousand pertaining thereto). [7]
- (b) The following was the pattern for demand of cars rented out by **BUANIM**, a tourist operator observed for 100 days.

No. of Cars	7	10	12	15
No. of Days	20	30	40	10

BUANIM, has only 10 Cars currently. Consider the following Table of two-digit random numbers:

Random Numbers	92	88	76	10	23
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Required:

- (i) **Using the** generated random numbers in Sequence, **Simulate** the demand for Cars over five days.
- (ii) **Calculate** the Average number of cars rented per day for the 5 days.
- (iii) **Analyze** how many rentals will be lost over the 5 days. [7]
5. (a) The simplex calculator company makes a profit of ₹5 on each model X and ₹20 on each model Y. Each calculator requires the following time (in minutes) on the cleaning and testing machines.

	X Requirements	Y Requirements	Time Available
Cleaning	2	4	10
Testing	6	3	12

- (i) State the objective function and constraints.
- (ii) Arrange the equations in a simplex format. [7]
- (b) **SOFTECH CONSULTANCY SERVICES LTD.** is developing a Software for online power transmission and distribution of a power supply Company. The Software development project has identified the following activities along with their expected duration (in days) under 3 Scenarios:

Activity and Identification		Duration in Days		
		Optimistic	Most likely	Pessimistic
A	1 – 2	12	16	20
B	1 – 3	15	20	25
C	2 – 3	6	8	10



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Activity and Identification		Duration in Days		
		Optimistic	Most likely	Pessimistic
D	2 – 4	8	10	12
E	3 – 4	5	6	7
F	4 – 5	8	12	16

Required:

- (i) **Analyze** the expected duration (in days) for each activity.
 - (ii) **Prepare** the PERT Net-work diagram indicating all paths through it.
 - (iii) **Identify** the Critical path and its duration (in days).
 - (iv) **Analyze** and indicate the total Float and free float of each activity. [7]
6. (a) Explain the concept of Balanced Scorecard as a performance management tool. How does it help in linking financial and strategic objectives of an organisation? Also explain the four perspectives from which organisational performance should be evaluated. [7]
- (b) “Although the idea of IoT has been in existence for a long time, a collection of recent advances in a **number** of different technologies has made it practical”. – **In this context identify** the said technologies. [7]
7. (a) “In spite of the fact that SWOT Analysis has several benefits yet, it has some limitations”. – **With reference to this statement, analyze and align** the limitations of SWOT Analysis. [7]
- (b) “In medium and Large organizations the various mechanism may be employed for identifying strategic”. – **With reference to this statement, identify and analyze** the said Mechanisms. [7]
8. (a) “In designing a Control System top Management should remember that control should follow Strategy”. **In this Context discuss the** guidelines a Strategic manager should keep in mind while implementing proper control. [7]
- (b) **Analyze and Align** the potential advantages and disadvantages of divisional Structure of the organisation. [7]