



OPERATIONS MANAGEMENT AND 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:

[15 x 2 = 30]

- (i) A department store has one storekeeper. The average number of customers handled by the storekeeper is 30 per hour. If the customer arrives at the store at mean rate of 25 per hour, what will be the average number of customers in the system:
- (a) 2 customers.
 - (b) 3 customers.
 - (c) 5 customers.
 - (d) None of the above.
- (ii) Which one of the following standards is associated with the "Quality Assurance" in Final Inspection Test"?
- (a) ISO 9001.
 - (b) ISO 9002.
 - (c) ISO 9003.
 - (d) ISO 9004.
- (iii) Business Process Re-engineering is:
- (a) eliminating loss-making process.
 - (b) redesigning operational processes.
 - (c) redesigning the product and services.
 - (d) recruiting the process engineers.
- (iv) Forecasting the weather is an example of:
- (a) Narrow AI.
 - (b) General AI/human-level.
 - (c) Super AI.
 - (d) Deep- learning.
- (v) 'Z' chart is a chart used in:
- (a) Programme control.
 - (b) Job control.
 - (c) Cost control.
 - (d) Quality control.
- (vi) The starting point of Production cycle is
- (a) Product design
 - (b) Production planning
 - (c) Routing
 - (d) Market Research
- (vii) The lead-time is the time:
- (a) To place holders for materials.
 - (b) Time of receiving materials.
 - (c) Time between receipt of material and using materials.
 - (d) Time between placing the order and receiving the materials.



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- (viii) The type of production control which is typically found where a particular bottleneck machines exists in the process of manufacturing is
- (a) Block control
 - (b) Load control
 - (c) Flow control
 - (d) Batch control
- (ix) Which one of the following is NOT the advantage of Preventive Maintenance?
- (a) Better product quality
 - (b) Greater safety of workers
 - (c) Increased breakdowns and downtime
 - (d) Fewer large-scale repairs
- (x) A Ltd., a large scale industry manufactures Product K of 24 units per shift of 8 hours. The standard time per unit is 15 minutes. What is the productivity of the per shift of 8 hours?
- (a) 50%
 - (b) 60%
 - (c) 75%
 - (d) 80%
- (xi) The objective function of a LPP is $Z = 3x_1 + 2x_2$. If $x_1 = 10$ and $x_2 = 5$, then the value of Z is:
- (a) 35
 - (b) 40
 - (c) 45
 - (d) 50
- (xii) A _____ is a business unit in a growing market, but not yet with high market share.
- (a) cash cow
 - (b) dog
 - (c) question mark
 - (d) star
- (xiii) The test is a catch-all category, indicating that the structure must fit legal, stakeholder, trade union or similar constraints.
- (a) The Feasibility Test
 - (b) The People Test
 - (c) The Parenting Advantage Test
 - (d) The Specialised Cultures Test
- (xiv) _____ is similar to referral programs.
- (a) Influencer marketing
 - (b) Affiliate Marketing
 - (c) Pay-per-click
 - (d) Content marketing
- (xv) What describes the categories of activities within and around an organization, which together create a product or service?
- (a) SWOT analysis
 - (b) BCG framework
 - (c) Value chain
 - (d) Brain storming



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SECTION – B

Answer any 5 questions out of 7 questions given. Each question carries 14 marks.

[5 x 14 = 70]

2. (a) Enumerate the scope of Operations Management [7]
- (b) Explain the scope of Total Quality Management. [7]
3. (a) Discuss briefly the concept of “Preventive maintenance” and its advantages. [3+4=7]
- (b) A manager has to decide about the number of machines to be purchased. He has three options i.e., purchasing one, or two or three machines. The data are given below:

Number of machine	Annual fixed cost	Corresponding range of output
One	₹ 12,000	0 to 300
Two	₹ 15,000	301 to 600
Three	₹ 21,000	601 to 900

Variable cost is ₹ 20 per unit and revenue is ₹ 50 per unit

A. What is the break-even point for each range?

B. If projected demand is between 600 and 650 units how many machines should the manager purchase? [7]

4. (a) A Co. is engaged in manufacturing five brands of packed snacks. It is having five manufacturing set-ups, each capable of manufacturing any of its brands one at a time. The cost to make a brand on these set-ups vary according to the following table:

Time Taken (in minutes) by 4 Workers

Brand \ Set-ups	Set-ups				
	S ₁	S ₂	S ₃	S ₄	S ₅
B ₁	4	6	7	5	11
B ₂	7	3	6	9	5
B ₃	8	5	4	6	9
B ₄	9	12	7	11	10
B ₅	7	5	9	8	11

Assuming five set-ups are S₁, S₂, S₃, S₄ & S₅ and five brands are B₁, B₂, B₃, B₄ & B₅. Compute the optimal assignment of products on these set-ups resulting in minimum cost. Use Hungarian method.

[7]



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- (b) An automobile production line turns out about 100 cars a day, but deviations occur owing to many causes. The production is more accurately described by the probability distribution given below:

Production/Day	Prob.	Production/Day	Prob.
95	0.03	101	0.15
96	0.05	102	0.10
97	0.07	103	0.07
98	0.10	104	0.05
99	0.15	105	0.03
100	0.20		
		Total	1.00

Finished cars are transported across the bay, at the end of each day, by ferry. If the ferry has space for only 101 cars, calculate what will be the average number of cars waiting to be shipped, and also calculate what will be the average number of empty space on the boat?

Use following Random Numbers to simulate the data provided above - 20, 63, 46, 16, 45, 41, 44, 66, 87, 26, 78, 40, 29, 92, 21. [7]

5. (a) K Ltd. an Engineering firm is using a machine whose purchase price is Rs. 13,000. The installation charges amount to Rs. 3,700 and the machine has a scrap value of only Rs. 1,400 because the firm has a monopoly of this type of work. The maintenance cost in various years as is shown below:

Year	1	2	3	4	5	6	7	8	9
Cost	300	850	1300	1900	2600	3300	4200	6000	7500

Required:

- (i) Determine after how many years should the machine be replaced on economic considerations (Assuming that machine replacement can be done only at the year-end).
(ii) Compute what will be the average cost of Replacement? [7]
- (b) B Ltd. has recently won a contract for the installation of a die casting machine and its associated building construction work at a local factory of large national firm of electronic engineers. Project manager has listed down the activities in the project as under:

Activity Identification	Preceding Activities	Duration (Days)	
A	1-2	-	1
B	2-3	A	3
C	2-4	A	15
D	2-5	A	1
E	3-5	B	10
F	4-5	C	6
G	5-6	D, E, F	1
H	6-7	G	1
I	6-8	G	15
J	7-8	H	2

Required:

- (i) Prepare and draw the network for the project.
(ii) Infer what are the possible paths with duration of the project.
(iii) Examine and identify the critical path with duration of the project. [3+2+2=7]



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6. (a) “A typical business firm usually considers three types of Strategy” – Explain. [7]
- (b) Explain various application areas of Internet of Things (IOT). [7]
7. (a) Robert Linneman and Rajan Chandran have suggested that a seven step process in contingency planning. In this context, discuss in brief what are the said steps in contingency planning. [7]
- (b) Analyze the four sorts of business as given in the BCG Matrix. [7]
8. (a) Discuss what do you understand by BPR. Examine what are the important reason to lead an organization to undertake re-engineering. [7]
- (b) Examine with examples, why do we need the Strategic Business Unit. [7]