OMMS/M-20   **13041**

MANAGEMENT SCIENCE
CP-201

Time : Three Hours]   [Maximum Marks : 70

Note : Attempt *eight* questions, out of ten questions, from Part A (each of 5 marks) *and* three questions out of five questions (each of 10 marks) from Part B.

Part A

1. Discuss the features of management science.

2. Solve the following LPP graphically :
Maximize $Z = 8x_1 + 16x_2$
Subject to :

$$x_1 + x_2 \leq 200$$
$$x_2 \leq 125$$
$$3x_1 + 6x_2 \leq 900$$
$$x_1, x_2 \geq 0$$

**3.** Using suitable examples, explain and illustrate :
   (a) Saddle point
   (b) Rule of dominance.

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4. Discuss the types of inventories and advantages and disadvantages of maintaining inventories.

5. Write a note on graphic approach to sensitivity analysis of LPP.

6. What is integer programming ? Give one example each of a pure and a mixed integer programming problem.

7. Identify all the paths in the following network :
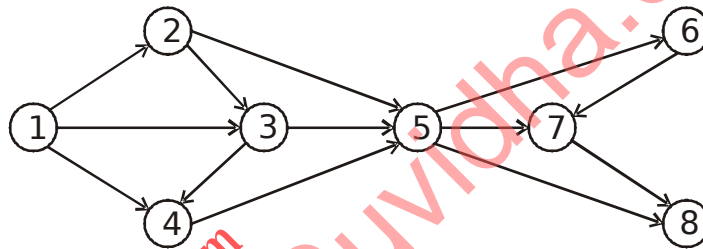
8. What is Simulation ? What are the benefits and application areas of simulation ?

9. In a queuing system, if arrival rate is 6 per hour and service rate is 10 per hour, find :
(a) Utilisation parameter
(b) L_q
(c) L_S
(d) W_q.

10. Find the optimal assignments to the following assignment problem for minimising the cost :

	Jobs		
Workers	A	B	C
P	4	2	8
Q	6	3	10
R	11	7	12

Part B

11. Discuss in detail the scope, methodology and limitations of management science.

12. Solve the following LPP by Simplex method :

Maximize $\quad Z = 40x_1 + 35x_2$

Subject to :

$$2x_1 + 3x_2 \leq 60$$
$$4x_1 + 3x_2 \leq 96$$
$$x_1, x_2 \geq 0$$

13. What is Queuing Theory ? In which types of problem situations can it be applied successfully ? Give the general structure of a queuing system and explain.

14. (a) Discuss the assumptions, applications and limitations of game theory.

(b) Discuss the process of simulation.

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15. Three time estimates (in weeks) vz optimistic (t_o) likely (t_m) and pessimistic (t_p) times of a PERT project are as given below :

Activity	o	m	
1-2	4	6	8
2-3	5	7	15
2-4	4	8	12
3-5	15	20	25
3-6	10	18	26
4-6	8	9	16
5-7	4	8	12
6-7	1	2	3
7-8	6	7	8

Draw the network, identify the critical path and find the probability of completing the project in 55 weeks.