SECOND SEMESTER M.Com. DEGREE EXAMINATION, APRIL 2021

(CUCSS - PG)

(Regular/Supplementary/Improvement)

CC19P MCM2 C10 - MANAGEMENT SCIENCE

(Commerce)

(2019 Admission onwards)

Time: Three Hours   Maximum: 30 Weightage

Section A

Answer any *four* questions. Each question carries 2 weightage.

1. What is saddle point?

2. What is meant by LPP?

3. What is meant by degeneracy in transportation problem?

4. Differentiate transportation and assignment problems

5. From the past records of a firm lead times noticed in a number of occasions are 10, 12, 18,15,20,21 days. Find the normal lead time.

6. What is Markov chains?

7. Explain the term EOQ

(4 × 2 = 8 Weightage)

Section B

Answer any *four* questions. Each question carries 3 weightage.

8. Write a short note about PERT

9. Solve the game whose payoff matrix is given by

Player B

Player A
$$\begin{pmatrix} 15 & 2 & 3 \\ 6 & 5 & 7 \\ -7 & 4 & 0 \end{pmatrix}$$

10. A farmer has 100 acres of farm. He can sell all tomatoes, lettuce, or radishes he can raise. The price he can obtain is Rs.5 per kg of tomatoes, Rs.2.00 a head lettuce and Rs.8.00 per kg for radishes. The average yield per acre is 2000kgs of tomatoes, 3000 heads of lettuce and 1000 Kgs of radishes. Fertilizer is available at Rs. 5 per kg and the amount required per acre is 100 Kgs each for tomatoes and lettuce and 50 Kgs for radishes. Labour required for sowing, cultivating and harvesting per acre is 5 man days for tomatoes and radishes and 6 man days for lettuce. A Total of 400 man days of labour are available at Rs 100 per man day. Formulate the problem as LPP which maximize the total profit of the farmer.

11. A project schedule ha the following characteristics.

Activity	Time	Activity	Time
1-2	4	5-6	4
1-3	1	5-7	8
2-4	1	6-8	1
3-4	1	7-8	2
3-5	6	8-10	5
4-9	5	9-10	7

a) Construct a network diagram.

b) Compute T_E and T_L for each event.

c) Find EST, LST, EFT, LFT values of all activities.

d) Find critical path and project duration.

12. The mean rate of arrival of planes at an airport during the peak period is 20 per hour, and the actual number of arrivals in any hour follows a Poisson distribution. The airport can land 60 planes per hour on an average in good weather and 30 planes per hour in bad weather, but the actual number landed in any hour follows a Poisson Distribution with these respective averages. When there is congestion, the planes are forced to fly over the field in the stack awaiting the landing of other planes that arrived earlier.

(1) How many planes would be flying over the field in the stack on an average in good weather and in bad weather?

(2) How long a plane would be stack and the process of landing in good and in bad weather?

13. Solve the following assignment problems for maintaining cost

	I	II	III	IV
A	32	26	35	38
B	27	24	26	32
C	28	22	25	34
D	10	10	16	16

14. Explain the Characteristics of Single Line Facility.

(4 × 3 = 12 Weightage)

Section C

Answer any *two* questions. Each question carries 5 weightage.

15. Solve the LPP by Graphic method.

Maximize $Z = 7X_1 + 5X_2$

Subject to $X_1 + 2X_2 \leq 6$

$4X_1 + 3X_2 \leq 12$

$X_1, X_2 \geq 0$

16. Find the optimal solution for the following transportation problem

		To				
		D_1	D_2	D_3	D_4	Supply
	O_1	6	4	1	5	14
From	O_2	8	9	2	7	16
	O_3	4	3	6	2	5
	Demand	6	10	15	4	

17. Explain Management science and how the management science is implemented in management problems

18. Use graphic method to solve the game

Player Y

	I	II	III	IV	V
Player X	6	3	-1	0	-3
	3	2	-4	2	-1

(2 × 5 = 10 Weightage)

****