D 122450 (Pages : 4) Name...

Reg. No....................................

SECOND SEMESTER M.Com. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, APRIL 2025

(CBCSS)

M.Com.

MCM 2C 10—MANAGEMENT SCIENCE

(2019 Admission onwards)

Time : Three Hours   Maximum : 30 Weightage

Answer should be written in english only.

Part A

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

1. Describe 'Monte Carlo' technique of simulation.

2. Define Linear Programming Problem ?

3. What is slack variable in LPP ?

4. What is an unbalanced transpiration problem ?

5. What do you mean by 'Balking' ?

6. What is total float in network analysis ?

7. Briefly explain Degeneracy in Transportation Problem.

(4 × 2 = 8 weightage)

Part B

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

8. A company produces two types of garments A and B. Both garments pass through two workmen, first a cutter and second a tailor. Garment A requires 2 hours of the cutter's time and 1 hour of the tailor's time ; garment B requires 1 hour of cutter's and 2 hours of tailor's time. The cutter has 104 hours and tailor has 76 hours of available time each month. Profit on garment A is Rs. 60.00 and on garment B is Rs. 110.00. Formulate a mathematical model.

Turn over

9. Solve the following LPP :

Maximize $Z = 6x_1 + 8x_2$
subject to
$$30x_1 + 20x_2 \leq 300$$
$$5x_1 + 10x_2 \leq 110$$
$$x_1, x_2 \geq 0.$$

10. Customers arrive at the first class ticket counter of a theatre at a rate of 12 per hour. There is one clerk service the customer at the rate of 30 per hour.

What is the probability that there is no customer in counter (idle system) ?

What is the probability that there are more than 2 customers in the counter ?

11. From the following information, find out the economic ordering quantity and the number of orders to be placed in a year

Annual Consumption : 120 units

Buying cost per order Rs. 20

Price per unit : Rs. 100.

Storage and carrying cost as percentage of average inventory : 12 %

12. Solve the following pay-off matrix, determine the optimal strategies and the value of the game :

B

A
5	1
3	4

13. Given below is the time (days) required when a particular programme is assigned to a particular programmer :

Programmer

	A	B	C	D
1	12	10	8	9
2	8	9	11	7
3	11	14	12	10
4	9	9	8	9

(Programmes)

Assign the programmers to the programmes in such a way that the total computing time is the least.

14. A project is expected to take 15 months along the critical path having a standard deviation of 3 months. What is the probability of completing the project on the due date, if the due date fixed is (a) 18 months ; and (b) 12 months ?

(4 × 3 = 12 weightage)

Part C

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

15. For a project given below find :

    (i) Expected time for each activity ;

    (ii) T_E and T_L values for all events ;

    (iii) Earliest Start Time, Earliest Finish Time, Latest Start Time, and Latest Finish Time values for all activities ; and

    (iv) The critical path

Task	:	A	B	C	D	E	F	G	H	I	J	K
Least time	:	4	5	8	2	4	7	8	4	3	5	6
				1		1	1	1		1		
Greatest Time	:	6	9	2	6	0	5	6	8	7	1	12
				1				1				
Most likely time	:	5	7	0	4	7	8	2	6	5	8	9

16. Solve the following transportation problem :

	D_1	D_2	D_3	D_4	D_5	D_6	*aj*
S_1	9	12	9	6	9	10	5
S_2	7	3	7	7	5	5	6
S_3	6	5	9	11	3	11	2
S_4	6	8	11	2	2	10	9
bj	4	4	6	2	4	2	

Turn over

17. A firm makes two types of garments : A and B, the contributions for each product as calculated by accounting department are Rs. 20 per A and Rs. 30 per B. Both products are processed on three machines M_1, M_2 AND M_3. The time required by each product and total time available per week in each machine are as follows :

Machine	A	B	Available hours
M1	3	3	36
M2	5	2	50
M3	2	6	60

How should the firm schedule its production in order to maximize contribution ?

18. Briefly explain the methodology of Management Science.

(2 × 5 = 10 weightage)