D 102107 **(Pages : 4)** **Name.....**

Reg. No.....

SECOND SEMESTER M.Com. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, APRIL 2024

(CBCSS)

Master of Commerce

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. Discuss the types of queueing models.
2. What is saddle point ?
3. How will you classify Markov chains ?
4. What is dummy activity ?
5. Explain FSN analysis.
6. What is critical activity ?
7. What do you mean by pure strategy ?

(4 × 2 = 8 weightage)

Part B

Answer any **four** *questions.*

Each question carries 3 *weightage.*

8. Explain the steps of optimality test using Modi method.
9. What are costs that are involved in carrying inventory ?

Turn over

10. Customers arrive at a window in a bank, according to-a Poisson distribution with mean 10 per hour. Service time per customer is exponential with mean 5 minutes. The space in front of the window including that for the serviced customers can accommodate a maximum of three customers. Other customers can wait outside this space.

    (a) What is the probability that an arriving customer can go directly to the space in front of the window ?

    (b) What is the probability that an arriving customer will have to wait outside the indicated space ?

    (c) How long is an arriving customer expected to wait before being served ?

11. From the following pay-off matrix find the value of game :

$$\begin{array}{cc} & \textit{Player B} \\ & \begin{array}{ccc} B_1 & B_2 & B_3 \end{array} \\ \textit{Player A} & \begin{array}{c} A_1 \\ A_2 \\ A_3 \end{array} \begin{bmatrix} 0 & 3 & 1 \\ 0 & -4 & -3 \\ 1 & 5 & -1 \end{bmatrix} \end{array}$$

12. Construct a network for a project whose activities and their predecessor relationship given in the table.

Activity	A	B	C	D	E	F	G	H	I	J	K
Predecessor	-	-	-	A	B	B	C	D	E	H, I	F, G

13. The demand rate of a particular item is 12000 units per year. The set-up cost per run is Rs. 350 and the holding cost is Rs. 20 per unit per month. If no shortages are allowed and the replacement is instantaneous, determine :

    (i) The optimum run size ;

    (ii) The optimum scheduling period ; and

    (iii) Minimum total expected annual cost.

14. Find the basic feasible solution of the following problem using Vogel's Approximation method :

Origin	*Destination*				*Supply*
	1	2	3	4	
1	20	22	17	4	120
2	24	37	9	7	70
3	32	37	20	15	50
Demand	60	40	30	110	240

(4 × 3 = 12 weightage)

Part C

Answer any **two** *questions.*

Each question carries 5 *weightage.*

15. What are types of decision? Elaborate the steps of decision making.

16. Solve the following problem using simplex method:

Maximize $Z = 6x + 3y$

Subject to the constraints :

$2x + 5y \leq 120$

$2x + y \leq 40$

$x \geq 0, y \geq 0.$

17. A computer centre has four expert programmers and needs to develop four application programmes. The head of the computer Centre, estimates the computer time (in minutes) required by the respective experts to develop the application programmes as follows :

Turn over

PROGRAMMES / PROGRAMMERS	A	B	C	D
1	120	100	80	90
2	80	90	110	70
3	110	140	120	100
4	90	90	80	90

Find the assignment pattern that minimize the time required to develop the application programmes.

18. What is PERT Network? Compare and contrast between CPM and PERT, in the context of project management.

(2 × 5 = 10 weightage)