5/8/21

Program: Master of Computer Applications

Curriculum Scheme: MCA 2 year Course

Examination: MCA 1 SEMESTER II

Course Code: MCA21 and Course Name: Mathematical Foundation for Computer Science 2

Time: 2 HRS Max. Marks: 80

Section I - MCQS (40 Marks) – 40 Minutes Section II – Subjective (40 Marks) – 80 Minutes

The timings If the Examination Time is 10:00 am to 12:00 noon

Section I – 11:00 am – 11:40 am Section II – 11:40 am – 1:00 pm

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SECTION II

Q2.Solve any two out of three (10 Marks each)

a. Use a graphical method to solve the following LP problem.

Maximize $Z = 3X_1 + 2X_2$

Subject to constraints

$X_1 - X_2 >= 1$

$X_1 + X_2 >= 3$

$X_1, X_2 >= 0$

b. Use VAM to solve the following transportation problem

		Distribution Centre			
		D1	D2	D3	D4
Plant	P1	2	3	11	7
	P2	1	0	6	1
	P3	5	8	15	9

c. In a supermarket four salesmen A, B, C, D are available for four counters W, X, Y, Z. Each salesman can handle one counter at a time. Service time in (hrs) by the salesmen for each counter is given below. Assign the salesman to the counters so that the service time is minimized.

		Salesman			
		A	B	C	D
Counters	W	5	3	2	8
	X	7	9	2	6
	Y	6	4	5	7
	Z	5	7	7	8

Q3. Solve any two out of three (10 Marks each)

a. Use Simplex method to solve

Maximize $Z = 16X_1 + 17X_2 + 10X_3$

Subject to constraints

$X_1 + X_2 + 4X_3 <= 200$

$2X_1 + X_2 + X_3 <= 360$

$X_1 + 2X_2 + 2X_3 <= 240$

$X_1, X_2, X_3 >= 0$

b. A garage mechanic finds the time spent on his jobs has exponential distribution with mean 45 minutes. If he repairs cars in the order in which they come in, which follows poisson distribution with a mean of 5 per 8 hour day. What is the mechanic's idle time each day. How many jobs are ahead of the average number of cars which came in?

c. Find the optimum strategy for Player A & B and value of the game where payoff matrix is given as follows

Player B

Player A	B1	B2	B3
A1	7	3	1
A2	1	7	3
A3	0	1	7