M.COM 2nd SEMESTER EXAMINATION, 2021

Sub: Operation Research & Computer in Business

Paper: COM 2036

Total marks: 80 **Time: 3 hours**

GROUP A

1. Answer (any six) from the given questions (word limit 50 to 75 words each) **(5x6=30)**

a) What are the various phases of an Operation Research process?

b) Define saddle point, pure and mixed strategies with proper examples.

c) In a game of matching coins with two players A and B, suppose A wins one unit of the value when there are two heads, wins nothing when there are two tails and loses ½ unit of value when there are one head and one tail. Determine the best strategies for each player and the value of the game to A.

d) Discuss the applications of queuing models in real life business situations.

e) In a railway marshalling yard, goods trains arrive at a rate of 30 trains per day. Assuming that the inter-arrival time follows an exponential distribution and the service time distribution is also exponential with an average 36minutes. Calculate the following:

i) Average numbers of trains the in system.

ii) Average waiting time in the queue.

iii) Utilization factor

f) Show how a transportation problem can be considered as an L.P.P.

g) Determine the optimum allocation of jobs to machines in the given problem.

Jobs	Machines			
	W	X	Y	Z
A	18	24	28	32
B	8	13	17	18
C	10	15	19	22

(h) Explain the role of Operations Research in business decision making.

2. Answer (any two) from the following questions (word limit 100 to 150 words each) (10x2=20)

a) Write a note on various assumptions made in M/M/1 queuing model. Also define different operating characteristics of queuing model.

b) Solve the following problem by using dominance property:

		B			
		B_1	B_2	B_3	B_3
A	A_1	1	2	-1	2
	A_2	3	1	2	3
	A_3	-1	3	2	1
	A_4	-2	2	0	-3

c) Find the minimum transportation cost using

(i) North West Corner Rule

(ii) Vogel's Approximation Method

Origin/Destination	D1	D2	D3	Supply
O1	0	2	1	6
O2	2	1	5	7
O3	2	4	3	7
Demand	5	5	10	20

d) Solve the following LPP using Simplex Method

$$\text{MinZ} = x_2 - 3x_3 + 2x_5$$

subject to

$$3x_2 - x_3 + 2x_5 \leq 7$$

$$-2x_2 + 4x_3 \leq 12$$

$$-4x_2 + 3x_3 + 8x_5 \leq 10$$

$$x_2, x_3, x_5 \geq 0$$

GROUP B

1. Answer the following questions:

(Word limit 50 to 75 words for 5 marks questions and 100 to 150 words for 10 marks questions)

a) Explain the role of Data Flow Diagram in database design.

OR

What are the characteristics of a system? 5

b) What is computer security? Explain its role in E-Commerce. 5

c) What is Digital signature? Discuss how it works.

OR

Discuss the elements of a system. 10

d) What is System Analysis and Design? Discuss its significance in business. 10

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