CDOE

MASTER OF COMPUTER APPLICATIONS (CBCS-2018 COURSE)

M.C.A. Sem - V : WINTER :- 2021

SUBJECT: OPTIMIZATION TECHNIQUES

Day : Wednesday
Date 23-02-2022

W-21103-2021

Time : 10:00 AM-01:00 PM
Max. Marks: 70

N.B.

1) Attempt any **FOUR** questions from section-I and attempt any **TWO** questions from section-II
2) Figures to the right indicate **FULL** marks.
3) Answers to both the sections should be written in **SAME** answer book.

SECTION – I

Q.1 What are the essential characteristics of Operations Research? Point out its limitations, if any. **(10)**

Q.2 Use the graphical method to solve the following LPP. **(10)**

Maximize $Z = 15x_1 + 10x_2$
Subject to the constraints
$4x_1 + 6x_2 \leq 360$
$3x_1 \leq 180$
$5x_2 \leq 200$
Such that $x_1, x_2 \geq 0$

Q.3 Write the algorithm of North West Corner Method for initial basic feasible solution of transportation problem. Hence obtain Initial Solution of the following transportation problem. **(10)**

	D_1	D_2	D_3	D_4	Supply
S_1	19	30	50	10	7
S_2	70	30	40	60	9
S_3	40	8	70	20	18
Demand	5	8	7	14	

Q.4 Discuss the advantages and disadvantages of Simulation. **(10)**

Q.5 A computer centre has three expert programmers. The centre wants three application programmes to be developed. The head of the computer centres after studying carefully the programmes to be developed estimates the computer time in minutes required by the experts for the application programme as follows: **(10)**

		Programmers		
		A	B	C
Programmes	1	120	100	80
	2	80	90	110
	3	110	140	120

Assign the programmers to the programmes in such a way that the total computer time is minimum.

Q.6 Explain the following terms in relation with decision theory. **(10)**

a) Design maker
b) Actions/Strategies
c) Events
d) Pay off matrix
e) Regret

P.T.O.

SECTION – II

Q.7 A television repairman finds that the time spent on his jobs has an exponential distribution with a mean of 30 minutes. If he repairs sets in the order in which they came in and if the arrival of sets follows a Poisson distribution approximately with an average rate of 10 per 8-hour day. What is the repairman's expected idle time each day? How many jobs are ahead of the average set just brought in? **(15)**

Q.8 Solve the following transportation problem for minimization: **(15)**

	Destination				
Sources	**A**	**B**	**C**	**D**	**Capacity**
X	9	12	9	6	70
Y	7	3	7	7	60
Z	6	5	9	11	90
Demand	70	50	70	30	

Q.9 An architect has been awarded a contract to prepare plans for an urban renewal project. The job consists of the following activities and their estimated times: **(15)**

Activity	**Immediate Predecessors**	**Time (Days)**
A	-	2
B	-	1
C	A	3
D	A, B	2
E	C, D	1
F	B, D	3
G	E,F	1

a) Draw the network diagram of activities for the project.
b) Indicate the critical path and calculate the total float and free float for each activity.

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