Day : Tuesday

Date 22-02-2022   W-5331-2021

Time : 10:00 AM-01:00 PM

Max. Marks: 80

N.B.:
1) Attempt **ANY FIVE** questions from Section – I and attempt **ANY TWO** questions from Section – II.
2) Answers to both the sections should be written in **SEPARATE** answer books.
3) Figures to the right indicate **FULL** marks.

SECTION – I

Q.1 What is operation research? Explain application areas of operation research. **[10]**

Q.2 What are different types of decision models? Explain advantages of each models. **[10]**

Q.3 Solve the following LPP graphically: **[10]**
Max $Z = 30x + 40y$
Subject to : $3x + 4y \leq 1100$
$\qquad\qquad 2x + 7y \leq 1600$
$\qquad\qquad x, y \geq 0$

Q.4 By using North West Corner Method, find initial basic feasible solution for the following transportation problem **[10]**

Factory	Warehouse				Capacity
	W_1	W_2	W_3	W_4	
P	17	18	15	19	130
Q	15	12	13	17	140
R	18	11	12	10	160
S	20	14	16	18	170
Requirements	100	200	150	150	

Q.5 Solve the following sequencing problem **[10]**

Jobs	1	2	3	4	5	6
Time on m/c 1	15	10	12	15	18	20
Time on m/c 2	12	17	24	15	18	18

Q.6 Draw network diagram for the following data. Find maximum time required for project completion. **[10]**

Activity	1 – 2	1 – 3	2 – 4	3 – 4	3 – 5	4 – 6	5 – 7	6 – 7
Time in days	15	12	17	28	13	18	12	8

Q.7 Write short notes on **ANY TWO** of the following: **[10]**
a) Applications and limitations of Linear Programming Problem
b) Degeneracy in transportation problem
c) PERT

P.T.O.

SECTION – II

Q.8   Obtain optimum assignment schedule from the following data: **[15]**

Machines \ Job	Time in hours				
	J_1	J_2	J_3	J_4	J_5
M_1	12	17	28	15	16
M_2	17	18	14	18	27
M_3	25	15	17	28	20
M_4	10	20	17	15	20
M_5	30	12	24	10	25

Q.9   A bakery shop owner has identified following demands with its probability   **[15]**

Demand	1	2	3	4	5	6	7	8	9	10
Frequency	15	12	17	9	12	6	10	7	9	3

Simulate the demand for 15 days.
Use following random numbers
67, 63, 39, 55, 29, 78, 40, 06, 78, 76, 39, 47, 39, 56, 86
Also find average demand per day.

Q.10   Find the optimum transportation schedule by using MODI method.   **[15]**

Retailer \ Warehouse	W_1	W_2	W_3	W_4	W_5	Demand
R_1	78	48	79	39	40	175
R_2	79	39	80	43	39	225
R_3	70	42	85	35	47	300
R_4	80	70	69	40	50	200
R_5	65	38	60	39	49	250
Supply	240	320	160	200	100	

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