49118 **M-4905**

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II SemesterM.B.A. Examination, September/October - 2020
(Scheme : CBCS)
BUSINESS ADMINISTRATION
Operations Research

Time : 3 Hours **Max. Marks : 70**

SECTION - A

Answer all questions.Each question carries 5 marks **[5 × 5 = 25]**

1. What is crashing of a network?
2. What is feasible solution in LPP?
3. What is duality in LPP?
4. What is degeneracy in transpostation problem?
5. Explain decision Tree with an example.

SECTION - B

Answer any three of the following question. Each question carries ten marks. **[3 × 10 = 30]**

6. Five programmers have five jobs to accomplish. Each programmer is estimated to require the following number of hours for each jobs.

Tasks

Programmers

	A	B	C	D	E
1	50	40	90	75	85
2	55	35	90	65	80
3	60	50	100	87	75
4	60	45	95	80	83
5	50	30	110	75	87

P.T.O.

Find the assignment of jobs to each programmer that will result in minimum time to complete all the jobs.

7. Solve the following LPP using simplex method.

Max $Z = 4x_1 + 10 x_2$

Subject to $2x_1 + x_2 \leq 50$

$2x_1 + 5x_2 \leq 100$

$2x_1 + 3x_2 \leq 90$

$x_1, x_2 \geq 0$

8. The transportation cost in rupees for shipping steel from furnances to rolling mills are given below.

Furnance	Rolling mills					Supply
	M_1	M_2	M_3	M_4	M_5	
A	4	2	3	2	6	8
B	5	4	5	2	1	12
C	6	5	4	7	7	24
Demand	4	4	6	8	8	

What is the optimal schedule and calculate optimal cost?

9. Find the sequence that minimum the total elapsed time required to complete the following jobs on machines M_1 M_2 and M_3 in the order M_1 , M_2 M_3.

Job :	A	B	C	D	E	F
M_1 :	8	3	7	2	5	1
M_2 :	3	4	5	2	1	6
M_3 :	8	7	6	9	10	9

10. A TV repairman funds that the time spent on his job has an exponential distribution with mean 30 minutes. If he repairs sets in the order in which they come and if the arrival of sets is approximately Poisson with an average rate of 10 per 8-hour day, what is his expected idel time each day? How many jobs are ahead of the set just brought in?

SECTION - C

(Compulsory)

11. The following table lists the jobs of a project with their time estimates. **[15]**

Job (1-j)	to (in days)	tm (in days)	tp (in days)
1 - 2	3	6	15
1 - 6	2	5	14
2 - 3	6	12	30
2 - 4	2	5	8
3 - 5	5	11	17
4 - 5	3	6	15
5 - 8	1	4	7
6 - 7	3	9	27
7 - 8	4	19	28

i) Draw the project network

ii) Calculate the length and variance of the critical path.

iii) What is the approximate probability that the jobs on the critical path will be completed by the due date of 42 days?