Name:

Enrolment No:

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UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2020

Course: Operations Research **Semester: VIII**
Program: B.Tech – ADE **Time 03 hrs.**
Course Code: ADEG461 **Max. Marks: 100**
Instructions:

SECTION A

S. No.		Marks	CO
Q 1	The initial basic feasible solution for the following transportation problem using NWCM is _____.	5	CO3
Q 2	If you solve the following linear programming problem by graphical method Max Z = 5X + 7Y Subject to constraints, $X + Y \leq 4$ $3X + 8Y \leq 24$ $10X + 7Y \leq 35$ $X, Y \geq 0$ The optimal solution is X = _____ , Y = _____	5	CO2
Q 3	For a game , the value of the pay-off matrix is given below	5	CO4

		Destination			
Source		A	B	C	Supply
	P	2	7	4	5
	Q	3	3	1	8
	R	5	4	7	7
	S	1	6	2	14
	Demand	7	9	18	34

	Player B

	Player A $\begin{bmatrix} -2 & 0 & 0 & 5 & 3 \\ 3 & 2 & 1 & 2 & 2 \\ -4 & -3 & 0 & -2 & 6 \\ 5 & 3 & -4 & 2 & -6 \end{bmatrix}$ The value of the game is (A) 2 (B) -4 (C) 3 (D) 1		
Q 4	Customers arrive at a one-window drive-in bank according to Poisson distribution with mean 10 per hour. Service time per customer is exponential with mean 5 minutes. The traffic intensity is (A) 0.55 (B) 0.35 (C) 0.83 (D) 0.25	**5**	**CO3**
Q 5	Consider the following project The critical path is (A) 1-2-3-5-8 (B) 1-2-4-5-8 (C) 1-6-7-8 (D) None	**5**	**CO4**
Q 6	In an assignment problem the time taken by different workers in completing the different jobs is given by	**5**	**CO3**

Activity	Optimistic time estimate	Most likely time estimate	Pessimistic time estimate
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

		Jobs			
		I	II	III	IV
Workers	A	8	10	12	16
	B	11	11	15	8
	C	9	6	5	14

	D | 15 | 14 | 9 | 7 The total time taken to complete the jobs is (A) 42 (B) 54 (C) 31 (D) 28		
SECTION B			
Q 7	Explain areas of application of Linear Programming.	**10**	**CO1**
Q 8	Differentiate Programme Evaluation and Review Technique (PERT) and Critical Path Method (CPM).	**10**	**CO2**
Q 9	Explain the terms queue length, system length and traffic intensity.	**10**	**CO1**
Q 10	Explain properties of a game.	**10**	**CO2**
Q 11	Write different steps to solve LPP by simplex method.	**10**	**CO2**
SECTION C			
Q 12	Classify the queueing models with the help of suitable examples.	**20**	**CO3**