Name: **Enrolment No:**	UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, May 2020

Programme Name: B.Tech ADE **Semester : VIII**
Course Name : Operations Research **Time : 03 hrs**
Course Code : ADEG461 **Max. Marks: 100**
Nos. of page(s) : 3
Instructions:

Section A

Q1 The initial basic feasible solution for the following transportation problem using NWCM is _____ . (5, CO3)

	to			Supply
From	2	7	4	5
	3	3	1	8
	5	4	7	7
	1	6	2	14
Demand	7	9	18	

Q2 A biscuit company can produce three products P1, P2, P3. Each of these products requires three different operations O1, O2, and O3. One unit of P1 requires 2h of O1, 2h of O2 and 3h of O3; one unit of P2 requires 3h of O1, 1h of O2 and 2h of O3; and a unit of P3 requires 4h of O1, 3h of O2, and 4h of O3. O1, O2 and O3 can operate for a maximum of 40 h, 50h and 150h respectively. The profit on each unit of P1, P2 and P3 is Rs 2, Rs 4 and Rs 3 respectively. If all the products is sold, Write the correct formulation of the LPP to maximize the profit. (5, CO2)

Q3 Customers arrive at a one-window drive-in bank according to Poisson distribution with mean 12 per hour. Service time per customer is exponential with mean 15 minutes. The traffic intensity is (5, CO3)

A) 2 B) 2.5 C) 4.5 D) 3

Q4 For a game , the pay-off matrix is given below

Player B

	Player B		
	B_1	B_2	B_3
Player A A_1	1	3	1
Player A A_2	0	-4	-3
Player A A_3	1	5	1

The position of the saddle point is

A) (A_1, B_1) B) (A_1, B_3) C) (A_3, B_1) D) (A_3, B_3)

5 CO4

Q5 Consider the following project

Activity	Optimistic time estimate	Most likely time estimate	Pessimistic time estimate
1-2	1	7	13
1-6	2	5	14
2-3	2	14	26
2-4	2	5	8
3-5	7	10	19
4-5	5	5	17
5-8	3	3	9
6-7	5	8	29
7-8	8	17	32

Expected project duration is

A) 36 B) 42 C) 54 D) 23

5 CO4

Q6 In an assignment problem the time taken by different workers in completing the different jobs is given by

		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

C will be assigned to

A) I B) II C) III D) IV

5 CO3

Section B			
Q7	Explain industrial application of Linear Programming.	10	CO1
Q8	Compare transportation model with assignment model.	10	CO2
Q9	Explain the terms activity, event, network and path.	10	CO1
Q10	Explain properties of a game.	10	CO2
Q11	Explain any two queuing model with help of suitable examples.	10	CO3

Section C			
Q12	Write different steps to solve LPP by BIG M method	20	CO2