Name of Student:..... *Roll No:*.....

TKM COLLEGE OF ENGINEERING, KOLLAM-5

Internal Assessment (Re Test) (Feb-2022)

DETAILS OF THE QUESTION PAPER

Programme: MCA

Semester:3

Course Code and Name: 20MCA261, ELECTIVE 3, OPERATIONS RESEARCH

Assessment Title\ Number: SERIES TEST 3

1. *This examination has4Questions in Part A and 6questions in Part B.*
2. Answer ...ALL... questions from PART A and ...four... questions from PART B
3. Duration of Exam: 2 hours
4. Maximum Marks: 50

PART A(3×10=30)

1. Define degenerate and non-degenerate basic solution to a given system of m simultaneous linear equations in n unknowns.
2. Explain the Simplex method for solving a Linear Programming Problem.
3. Write the dual of the LPP, Min $z = 3x_1 + 5x_2$ subjected to

$$2x_1 + 8x_2 \geq 40$$

$$3x_1 + 4x_2 \geq 50$$

$$x_1, x_2 \geq 0.$$

4. State the fundamental theorem of duality.
5. Define Critical activity. Explain the differences of CPM and PERT?
6. A small project consists of seven activities for which the relevant data is given below

Activity	:	A	B	C	D	E	F	G	H	I	J	K
Preceding activities:		-	-	A	B	A	B	C, D	G, F	E	H, I	J

Draw the network .

7. What are the steps involved in North West Corner Rule (NWCR Method)?
8. Obtain an initial basic feasible solution to the following Transportation problem using Matrix minimum (Least cost) method

	DI	D2	D3	D4	Capacity
O1	1	2	3	4	6
O2	4	3	2	0	8
O3	0	2	2	1	10
Demand	4	6	8	6	

9. What are the characteristics of queueing?
10. Define Balking, Reneging and Jockeying.

P.T.O

PART B

(5×4=20)

11. A project schedule has the following characteristics.

Activity:	1-2	1-3	1-4	2-5	3-6	3-7	4-6	5-8	6-9	7-8	8-9
Time :	2	2	1	4	8	3	1	8	5	4	3

(i) Construct the network

(ii) Compute E and L for each event

(iii) Find the critical path and calculate the three floats for each activity

12. A project consists of eight activities with the following relevant information:

Activity	Immediate predecessor	Estimated duration (days)		
		Optimistic	Most likely	Pessimistic
A	--	1	1	7
B	--	1	4	7
C	--	2	2	8
D	A	1	1	1
E	B	2	5	14
F	C	2	5	8
G	D, E	3	6	15
H	F, G	1	2	3

(i) Draw the PERT network and find out the expected project completion time.

(ii) Find the variance of the project?

13. Solve the following assignment problem

	I	II	III	IV
A	20	13	7	5
B	25	18	13	10
C	31	23	18	15
D	45	40	23	21

14. Solve the Transportation problem

	D1	D2	D3	D4	ai↓
O1	5	2	4	3	22
O2	4	8	1	6	15
O3	4	6	7	5	8
bj→	7	12	17	9	

15. A barber shop with one man takes exactly 25 minutes to complete haircut. If customers arrive in poisson's fashion at an average rate of every 40 minutes, how long on the average must a customer wait for service?