

GURU NANAK COLLEGE (Autonomous) , VELACHERY
DEPARTMENT OF MATHEMATICS (SHIFT-II)
MODEL EXAMINATIONS - DECEMBER 2021
OPERATIONS RESEARCH

22/12/2021

Class : II BSc (CS)
 Code :

Marks : 100 Marks
 Time : 3 Hours

Section - A

ANSWER ANY 10 QUESTIONS

(10 x 3 = 30)

1. Define OR. Write any 2 application of OR?
2. Define slack variable?
3. What is Balanced and unbalanced Transportation Problem?
4. Define Assignment problem?
5. Solve the game

12	1	30	-10
20	3	10	5
-5	-2	25	0
15	-4	10	6

6. Find the order of sequence

Jobs	1	2	3	4
Machine A	10	2	18	6
Machine B	4	12	14	16

7. What is zero sum game and game matrix?
8. Draw Project network diagram $A < B, A < C, B < D, C < E, E < D$.
9. Define CPM and PERT. *program evaluation and review tech*
10. What are the types of time estimates?
11. What is Data lake?
12. Mention the purpose NoSQL?

Section - B

ANSWER ANY 5 QUESTIONS

(5 x 6 = 30)

13. Solve the following using graphical method.
 Minimize $z = 4x_1 + x_2$
 Subject to $3x_1 + 4x_2 \geq 20$,
 $-x_1 - 5x_2 \leq -15$
 $x_1, x_2 \geq 0$

14. Find IBFS using VAM?

	A	B	C	Demand
E	10	9	8	8
F	10	7	10	7
G	11	9	7	9
H	12	14	10	4
Supply	10	10	8	

15. Solve the game.

	Player B			
Player A	3	-1	1	2
	-2	3	2	3
	2	-2	-1	1

16. Explain the applications of OR?

17. The Project scheduling has the following characteristics: -

Activity	1-2	1-3	2-4	2-6	3-4	3-5	4-5	5-6
Optimistic	1	5	3	1	8	2	5	2
Most likely	4	10	3	4	15	4	5	5
Pessimistic	7	17	3	7	26	8	5	8

Draw the network and find expected project completion time.

18. 6 jobs go first over Machine 1 and then over Machine 2. The order of the completion of job has no significance.

Job	1	2	3	4	5	6
Machine 1	5	9	4	7	8	6
Machine 2	7	4	8	3	9	5

Find the sequence of job that minimize the total elapsed time to complete jobs.

19. Explain the Concept Cloud Computing in detail?

Section - C

ANSWER ANY 4 QUESTIONS

(4 x 10 = 40)

20. Solve by using Simplex Method.

$$\text{Maximize } z = 5x_1 + 3x_2$$

$$\text{Subject to } 3x_1 + 5x_2 \leq 15$$

$$5x_1 + 2x_2 \leq 10$$

$$x_1, x_2 \geq 0$$

21. Draw a project network and determine the critical path, project duration, EFT, LST, FF?

Job	1-2	1-3	1-4	2-5	3-6	3-7	4-7	5-8	6-8	7-9	8-9
Duration	2	2	1	4	5	8	3	1	4	5	3

22. Solve the following assignment problem.

	1	2	3	4	5
A	11	17	8	16	20
B	9	7	12	6	15
C	13	16	15	12	16
D	21	24	17	28	26
E	14	10	12	11	15

23. Solve the following game

	C	D	E	F	G
A	2	-2	3	7	6
B	6	5	1	4	0

24. Find the sequence that minimizes the total time (the order is I - II - III)

Task	:	A	B	C	D	E	F	G
Machine I	:	3	8	7	4	9	8	7
Machine II	:	4	3	2	5	1	4	3
Machine III	:	6	7	5	11	5	6	12

25. Explain briefly about Big Data?
