B.C.A DEGREE EXAMINATION,NOVEMBER 2019
III Year V Semester
Resource Management Technique

Time : 3 Hours **Max.marks :75**

Section A $(10 \times 2 = 20)$ Marks

Answer any **TEN** questions

1. Define Operation Research.
2. What are the limitations of OR?
3. Give the mathematical formulation of transportation problem.
4. Define Assignment problem.
5. Explain the Processing time for sequencing problem.
6. What is sequencing?
7. Explain the principle of Dominance.
8. What is saddle point?
9. Differentiate PERT and CPM.
10. What is Slack Time?
11. Discuss unbalanced assignment problem.
12. What is Linear Programming?

Section B $(5 \times 5 = 25)$ Marks

Answer any **FIVE** questions

13. Explain the phases of operation research.
14. Determine an initial basic feasible solution to the following transportation problem using NWCR.

	D_1	D_2	D_3	D_4	Supply
O_1	6	4	1	5	14
O_2	8	9	2	7	16
O_3	4	3	6	2	5
Required	6	10	15	4	35

15. The following five jobs must go through the two machines A and B in the order AB. Processing times are given below:

Job	1	2	3	4	5
Machine A	5	1	9	3	10
Machine B	2	6	7	8	4

Determine a sequence for the five jobs that will minimize the total elapsed time.

16. Explain Game theory.
$$\begin{bmatrix} 4 & -1 & 5 \\ 0 & 5 & 3 \\ 5 & 3 & 7 \end{bmatrix}$$
17. Explain the basic components of Network.
18. Solve the following LPP using graphical method.
Maximise
$z = 30x_1 + 20x_2$
subject to $2x_1 + x_2 \leq 800$
$x_1 - 2x_2 \leq 1000$
19. Explain Vogues approximation method of solving transportation problem.

Section C $(3 \times 10 = 30)$ Marks

Answer any **THREE** questions

20. Using Simplex method solve the LPP.
Max Z $= x_1 + x_2 + 3x_3$
Subject to, $3x_1 + 2x_2 + x_3 \leq 3$
$2x_1 + x_2 + 2x_3 \leq 2$
$x_1, x_2, x_3 \geq 0$
21. Find the initial solution to the following Transportation problem using Vogel's Ap-proximation method. Destination

Factory		D_1	D_2	D_3	D_4	Supply
	F_1	3	3	4	1	100
	F_2	4	2	4	2	125
	F_3	1	5	3	2	75
	Demand	120	80	75	25	300

22. What is traveling salesman problem? solve

α	4	7	3	4
4	α	6	3	4
7	6	α	7	5
3	3	7	α	7
4	4	5	7	α

23. solve a game
$$\begin{bmatrix} 3 & -1 & 1 \\ -2 & 3 & 2 \\ 2 & -2 & -1 \end{bmatrix}$$
24. A small maintenance project consists of the following jobs, whose precedence rela-tionships are given below.

Job	1-2	1-3	2-3	2-5	3-4	3-6	4-5	4-6	5-6	6-7
Duration	15	15	3	5	8	12	1	14	3	14

a) Draw an arrow diagram representing the project.
b) Find the total float for each activity.
c) Find the critical path.