B.Sc. DEGREE EXAMINATION,NOVEMBER 2018
III Year V Semester
Core Elective - Paper I
RESOURCE MANAGEMENT TECHNIQUES

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

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

Answer any **TEN** questions

1. Write any two applications of Operation Research
2. Why we call Operation Research as a decision making science?
3. Mention any two advantages of Linear Programming.
4. What is slack variable?
5. Define basic feasible solution in LP.
6. Define transportation problem.
7. What is surplus variable?
8. Write the difference between transportation problem and assignment problem.
9. Define total elapsed time in sequencing problem.
10. Define pay-off matrix.
11. What is meant by networking scheduling?
12. Define simulation of a system.

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

Answer any **FIVE** questions

13. Write at least five applications of L.P.P.
14. Write an algorithm for Dual-Simplex method.
15. Describe the transportation problem with its general mathematical formulation.
16. Solve the following assignment problem :

	I	II	III	IV
A	15	14	12	16
B	23	22	25	24
C	31	34	32	33
D	21	32	44	53

17. Write an algorithmic steps for processing n-jobs through 2-machines.
18. Solve the following game $\begin{bmatrix} 3 & -2 \\ -2 & 5 \end{bmatrix}$ Find the value of the game.

19. Solve the transportation problem.

	S_1	S_2	S_3	S_4	Availability
A	5	2	4	3	22
B	4	8	1	6	15
C	4	6	7	5	8
Demand	7	12	7	19	45

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

Answer any **THREE** questions

20. A trucking firm has received an order to more 3,000 tonnes of industrial material to a destination 1,000 km away. The firm has available at the moment a fleet of 150 class – A 15 tonne trailer trucks and another fleet of class – B 10 tonnes trailer trucks. The operating costs of these trucks are Rs 3 and Rs 4 pertonnes per km, respectively. Based on past experience, the firm has a policy of retaining at least one class – A truck with every two class – B trucks in reserve. It is desired to know how many of these two classes of vehicles should be dispatched to move the material at minimal operating costs. Formulate this problem as an LP model.

21. Use the penalty method to solve the following LP problem.

    Maximize $Z = 2x_1 + x_2 + 3x_3$
    subject to constraints : $x_1 + x_2 + 2x_3 \geq 5$,
    $2x_1 + 3x_2 + 4x_3 = 12$ and $x_1, x_2, x_3 \geq 0$

22. Goods have to be transported from sources S1, S2 and S3 to destinations D1, D2, and D3. The transportation cost per unit, capacities of the sources and requirements of the destinations are given in the following table.

	D1	D2	D3	Supply
S1	8	5	6	120
S2	15	10	12	80
S3	3	9	10	80
Demand	150	80	50	

    Determine a transportation schedule so that cost is minimized.

23. Find the sequence that minimizes the total time required in performing the following jobs on three machines in order ABC. Processing times hrs are given in the following table:

Job	1	2	3	4	5
Machine A	8	10	6	7	11
Machine B	5	6	2	3	4
Machine C	4	9	8	6	5

24. Explain the PERT/CPM network components and precedence relationships with diagram.

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