B.Sc DEGREE EXAMINATION,APRIL 2019
III Year V Semester
Resource Management Techniques

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

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

Answer any **TEN** questions

1. What is slack variable?
2. A firm manufactures two types of product A and B and sells them at profit of Rs2 on type A and Rs3 on type B. Each products is processed on two machines M1 and M2.Type A requires 1 minute of processing time on M1 and 2 minutes on M2 Type B requires 1 minute of processing time on M1 and 1 minute on M2.Machine M1 is available for not more than 6 hours 40 minutes while machine M2 is available for10 hours during working day. Formulate the problem as a LPP so as to maximize the profit.
3. When can an assignment problem be viewed as transportation problem?
4. What are the methods used in transportation problem to obtain the initial basic feasible solution.
5. Define route condition?
6. What is a traveling salesman problem?
7. What is minimax criterion?
8. Define Critical Path?
9. What is the difference CPM and PERT?
10. Define Dominance property.
11. Define basic solution.
12. What is linear programming?

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

Answer any **FIVE** questions

13. State the applications and limitations of linear programming
14. Solve the following LPP graphically

    $x + 3y \geq -6$

    $2x + y \leq 8$

    $x, y \geq 0$

15. Explain the difference between transportation and assignment problems?

16. Solve the following assignment problem to minimize the total cost represented as elements in the matrix (cost in thousand rupees)

Building	Contractor			
	A	B	C	D
1	48	56	96	42
2	48	60	94	44
3	50	60	90	54
4	44	68	85	46

17. Suppose we have five jobs, each of which has to be processed on two machines A & B in the order AB. Processing times are given in the following table:

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

Determine an order in which these jobs should be processed so as to minimize the total processing time.

18. What are the advantages of CPM and PERT techniques?

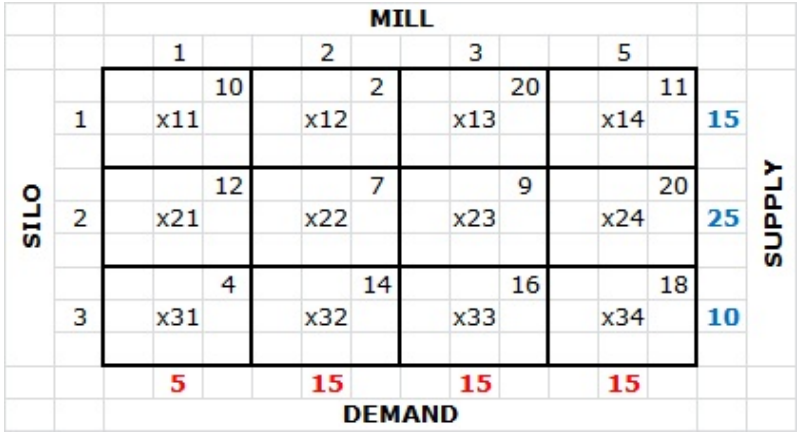
19. List down the characteristics of games

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

Answer any **THREE** questions

20. Maximize $z = 3x_1 + 2x_2$
subject to $-x_1 + 2x_2 \leq 4 \quad 3x_1 + 2x_2 \leq 14 \quad x_1 - x_2 \leq 3$
$x_1, x_2 \geq 0$

21. Solve the following balanced transportation problem that has 3 supply sources (silos) and 4 demand sources (mills).



22. Strong Book Binder has one printing machine, one binding machine, and the manuscripts of a number of different books. Processing times are given in the following table:

Book	Time In Hours	
	Printing	Binding
A	5	2
B	1	6
C	9	7
D	3	8
E	10	4

Determine the order in which books should be processed on the machines, in order to minimize the total time required and find the Idle time for printing process , idle time for binding process.

23. Find Solution of game theory problem using algebraic method

$Player\ A \backslash Player\ B$	B1	B2
A1	1	7
A2	6	2

24. Widgetco is about to introduce a new product. One unit of this product is produced by assembling subassembly 1 and subassembly 2. Before production begins on either subassembly, raw materials must be purchased and workers must be trained. Before the subassemblies can be assembled into the final product, the finished subassembly 2 must be inspected. A list of activities, their predecessors, and their durations is given in the following Table.

Activity	Predecessors	Duration(days)
A – Train workers	———	6
B – Purchase raw materials	———	9
C – Make subassembly 1	A,B	8
D – Make subassembly 2	A,B	7
E – Inspect subassembly 2	D	10
F – Assemble Subassemblies	C,E	12

a) What is the total project time?

b) What is the critical path?