Maths questions

Module 1

1. Define Operations Research
2. Write any three applications of Operations research
3. Discuss the phases of operations research
4. Discuss the methodology of operations research
5. Write a note on the tools used in operations research
6. What is meant by LPP
7. What are the basic assumptions in LPP
8. What is Linear Programming
9. Write the general form of a LPP
10. Explain the components of LPP
11. Discuss Canonical Form of LPP
12. Discuss Standard form of LPP
13. Write in canonical form : Max z = 3x +6y subject to 2x-3y >= 10, x+y =6, x,y >=0
14. Write the given LPP in standard form : Min z = x +4y subject to x -3y >= 10, 2x+y =6, x,y >=0
15. What are the two forms of LPP ?
16. Define feasible Solution of LPP
17. What is a basic feasible solution ?
18. Define degenrate basic feasible solution in LPP
19. Discuss the steps involved in mathematical formulation of LPP
20. Explain mathematical modelling of a Linear Profgramming Problem
21. Discuss search approach method for solving LPP
22. What are the limitations of graphical method of solving a LPP?
23. What is a feasible region ?
24. What is unbounded solution and how does it occur in graphical method?

Module 2

1. What are slack variables? Explain with an example.
2. What are surplus variables? Explain with an example.
3. How do you interept Slack and Surplus variable ?
4. What is the role of Slack and Surplus variable in Simplex method?
5. Why do the slack and surplus variables having zero coefficient in the objective function?

6. Why is simplex method used?
7. How do you solve a problem using simplex method?

8. What is the criterion for selecting the entering basic variable?

9. How is the leaving basic variable identified?
10. Which type of problems are solved by simplex method?
11. What you mean by Artificial variable in LPP , explain it with an example?
12. What is the use of Artificial avriables? How are artificial variables used in simplex method?
13. In which context we use Big M method?

14. Advantages of Big M method.
15. Explain how do you solve the Big M method?
16. What you mean by Duality in LPP?
17. Define what is dual and primal of a linear programming problem?
18. What are the advantages of duality in LPP?

19. Write the dual to the following LP problem. Maximize $Z = x - y + 3z$ subject to the constraints $x + y + z \leq 10$, $2x - y - z \leq 2$, $2x - 2y - 3z \leq 6$ and $x, y, z \geq 0$.

20. Write the dual to the following LP problem
    Max $Z = 2x + 5y + 6z$
    subject to $5x + 6y - z \leq 3$, $-2x + 3y + 4z \leq 4$, $x - 5y + 3z \leq 1$, $-3x - 3y + 7z \leq 6$ and $x, y, z \geq 0$.

Module 3

1. Define Transportation Problem
2. Explain Transportation table
3. What do you mean by degeneracy in transportation problem.
4. Write a note on transportation problem.
5. Explain transportation problem and show that it can be considered as an LPP
6. Explain Vogel's method for finding intial basic feasible solution.
7. What is an unbalanced transportation problem? How is it solved
8. Q M3 A8
9. Q M3 A9
10. Q M3 A10
11. Define Assignment Problem
12. Explain LPP form of an Assignment problem
13. Write a note on Assignment problem.
14. Give the mathematical formulation of an assignment problem
15. "An Assignment problem is a special case of a transportation problem".Explain.
16. What are the steps in solving an assignment problem
17. What is an unbalanced assignment problem? How is it solved
18. Explain the Diffrence between transportation and assignment problem.
19. Formulate the travelling salesman problem as an Assignment problem.
20. Explain travelling salesman problem.

Module 4

1. What is mean by mixed strategy ?
2. What is mean by pay off matrix?
3. What is mean by value of the game?
4. What is mean by game? What are the assumptions of a game?
5. What is mean by strategy in game theory? Explain.
6. Explain maximin minimax principles.
7. What is mean by zero sum games?
8. What is mean by fair game?
9. What is mean by two person zero sum games?
10. What is mean by saddle point?
11. What is mean by principle of dominance?
12. Give any two methods to solve mixed strategy problems?
13. What is mean by dominance property?
14. Explain the graphic method to solve 2 * n games.
15. Explain the graphic method to solve m * 2 games.
16. What is mean by traffic intensity?
17. What are the elements of the queing system?
18. what is mean by queue discipline?
19. What is mean by (i) Balking (ii) reneging (i)jockeying in queueing theory?
20. What are customer's behaviour in a queue?

Module 5

1. What is a network
2. What are the three main phases of a project.
3. What are the advantages of CPM and PERT
4. Briefly explain the areas of applications of network techniques
5. What are the two basic planning and control techniques in a network anlysis
6. What do you mean by an activity of a project
7. What are the three common errors in the construction of netwoks
8. What is dangling in a network. How is dangling avoided in the network.
9. What is a dummy activity and when is it needed.
10. What are the rules of network construction ?
11. Define critical activity and critical path
12. What are the three types of floats ? Explain briefly.
13. Distinguish between 'slack' and 'float'
14. Explain briefly the critical path method
15. Explain the following terms (i) Earliest event time (ii) Latest event time
16. Explain the following terms (i) Earliest and Latest start times of an activity (ii)Earlist and Latest finish times of activity.
17. What are the three time estimates in PERT calculations.?
18. Explain PERT
19. What are activity variance and project variance ?
20. What is PERT?. What advantages does it have over CPM.
21. Distinguish between CPM and PERT
22. What is meant by simulation ? Why is it used ?
23. What are the advantages of simulation ?
24. What are the disadvantages of simulation ?
25. Write some applications of simulation
26. What is Monte Carlo simulation
27. What is sequencing problem
28. What are the assumptions in sequencing problems ?
29. Define total elapsed time and idle time in sequencing problems.
30. What is meant by 'no passing rule' in sequencing problem ?
31. Explain briefly how 'n' jobs on 2 machines problem can be solved.