2005 ANDHRA UNIVERSITY M.C.A

MCA 2.2.3

OPERATIONS RESEARCH

Time : 3 hour
Mark : 100

First Question is Compulsory

Answer any four from the remaining

Answer all parts of any Question at one place.

1. Write short notes on the following:
a) Graphical Method for solving a Linear Programming Problem.
b) Explain the Duality in linear programming.
c) Zero sum Game.
d) Economic order Quantity (EOQ).
e) Min-Max Method.

2. a) Explain the characteristics of LP model.

b) Solve the following LP problem by using Simplex method:
Minimize : z = 2x1 + 4x2 + x3
Subject to 4x1 + 8x2 + 2x3 = 40
-3x1+2x2 = 6
x+2x+x=24
x1, x2, x3 = 0

3. a) Explain the reasons for analysing a primal linear programming problem in terms of dual form.

b) Given the following linear programming problem:
Minimize z = 4x1 + 3x2
Subject to :
2x1 + x2 = 10
-3x1 + 2x2 = 6
x1 + x2 = 6
x1 , x2 = 0
Solve using the dual simplex method.

4. a) Explain the Transportation and Transhipment problems.
b) Given the following Transportation problem:

To A B C D Supply
From
1 5 12 7 10 50
2 4 6 7 6 50
3 2 8 5 3 60
Demand 40 20 30 70

Find the initial solution by VAM method and optimum solution by MODI method.

5. a) Explain the Travelling Salesman Problem

b) A dispatcher presently has six taxicabs at different locations and five customers who have call for service. The mileage from each taxi's present location to each curstomer is

Customer 1 2 3 4 5
Cab
A 7 2 4 10 7
B 5 1 5 6 6
C 8 7 6 5 5
D 2 5 2 4 5
E 3 3 5 8 4
F 6 2 4 3 4

Determine the optional assignment that will minimize the total mileage.

6. a) Explain the Critical Path method.
b) A project being planned involved the following activities:

Activity Predecessor Duration
A - 14
B A 21
C A 50
D B 14
E C,D 30
F E 10

Construct the network.
Determine expected project completion time.
Determine free slack and total slack.

7. a) Explain the Graphical Method for solving a Game.

b) Find the Optimal solution for the following game using Graphical method:

Player B
1 2 3 4 5

Player A 4 2 5 -6 6
7 -9 7 4 8
8. a) Explain the Integer Programming problem.

b) Explain the Branch and Bound Technique for solving an Integer Programming Problem