Roll No............................

Total No. of Questions : 13] [**Total No. of Pages : 03**

Paper ID [B0120]

(Please fill this Paper ID in OMR Sheet)

BBA (BB - 403) (S05) (O) (LE) (Sem. - 4th)

OPERATIONS RESEARCH

Time : 03 Hours **Maximum Marks : 75**

Instruction to Candidates:

1) Section - A is **Compulsory**.

2) Attempt any **Nine** questions from Section - B.

Section - A

Q1) (15 × 2 = 30)

a) Define a general linear programming problems.

b) What are applications of O.R?

c) What are the advantages of Simplex method over Graphical method?

d) Define the dual of linear prog. problem.

e) When we use BIG-M method?

f) Define Economic Order Quantity (EOQ)

g) Differentiate Dynamic programming and Inventory control.

h) What is Decision tree analysis?

i) What is price break in Inventory Control?

j) What are various rule for determining a saddle point?

k) How can we formulate the transport problem as linear L.P?

l) What is Degenracy?

m) What is transhipment problem? How can we solve it?

n) Write the steps for mathematical formulation of Assignment problem.

o) When Assignments are prohibited?

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Section - B

(9 × 5 = 45)

Q2) A firm manufactures headache pills in two sizes A and B. Size A contains 2 grains of asprin, 5 grains of bicarbonate and 1 grain of codeine. Size B contains 1 grain of asprin, 8 grains of bicarbonate and 6 grains of codeine. It is found by users that it requires at least 12 grains of asprin, 74 grains of bicarbonate and 24 grains of codeine for providing immediate effect. It is required to determine the least no. of pills a patient should take to get immediate relief formulate the problem.

Q3) Solve Graphically :

Minimize $(Z) = X_1 + 0.5X_2$

Subject to

$$3X_1 + 2X_2 \leq 12$$
$$5X_1 \leq 10$$
$$X_1 + X_2 \geq 8$$
$$-X_1 + X_2 \geq 4$$

Q4) Explain Two-Phase method.

Q5) What is primal problem and dual problem? How can we formulate a dual problem?

Q6) What is degeneracy in Transportation?

Q7) Obtain the initial basic feasible solution to the following transport problem using North-West Corner rule.

	D	E	F	G	Available
A	11	13	17	14	250
B	16	18	14	10	300
C	21	24	13	10	400
Requirement	200	225	275	250	

Q8) How can we solve an Assignment problem?

Q9) Explain following in Game theory strategy, maximax principle, minimax principle.

Q10) Explain Decision tree with example?

Q11) What are various factors which effect the inventory control.

Q12) Explain EOQ problems with price break.

Q13) Discuss the 'Hungarian' method of solving an assignment problem.

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