Roll No. .....

Total No. of Questions : 07] [Total No. of Pages : 02

BCA (Sem. - 5th)

OPERATIONS RESEARCH

SUBJECT CODE : BC - 504(N2)

Paper ID : [B0222]

[Note : Please fill subject code and paper ID on OMR]

Time : 03 Hours **Maximum Marks : 60**

Instruction to Candidates:

1) Section - A is **Compulsory**.
2) Attempt any **Four** questions from Section - B.

Section - A

Q1) *(10 × 2 = 20)*

a) Give limitations of Operations Research.

b) Explain Slack and Artificial variable.

c) Give relationship between Primal and Dual.

d) Explain Modified Distribution Method.

e) Give characteristics of Operations Research.

f) Explain Hungarian Assignment Method.

g) Explain North West Corner Method for obtaining initial feasible solution.

h) What is Unbalanced Transportation Problem?

i) Discuss the steps involved in the process of decision making under risk.

j) Give various advantages of Dynamic Programming.

Section - B

(4 × 10 = 40)

Q2) What are the different types of models used in Operations Research? Explain in detail.

Q3) Solve the following LPP by Simplex Method :

Maximize $Z = 2x_1 + 3x_3$

Subject to : $x_1 + x_2 + 2x_3 \leq 5$

$2x_1 + 3x_2 + 4x_3 = 12$

where as x_1, x_2 and $x_3 \geq 0$.

Q4) What is meant by degeneracy in transportation problem? How is degeneracy resolved in such problems?

Q5) Solve the following salesman problem given by the following data:

$c_{12}=20$, $c_{13}=4$, $c_{14}=10$, $c_{23}=5$, $c_{34}=6$, $c_{25}=10$, $c_{35}=6$, $c_{45}=20$

Where $c_{ij}=c_{ji}$ and there is no route between cities i and j if a value of c_{ij} is not known.

Q6) What is decision making under 'uncertainty'? What are the assumptions in decision making under 'uncertainty'? Also give its limitations.

Q7) What is Integer Programming? Explain whether an Integer Programming Problem can be solved by rounding off the corresponding simplex solution.