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

BCA (Sem.-5th)
OPERATION RESEARCH
Subject Code : BC-504
Paper ID: [B0222]

Time: 3 Hrs.   **Max. Marks: 60**

INSTRUCTIONS TO CANDIDATE:
1. **Section –A, is Compulsory.**
2. **Attempt any four questions from Section-B.**

Section –A
(10x2=20)

Q.1.   Write briefly the following:

(a)   List the different addressing nodes.

(b)   Define Linear Programming. Enlist the various fields where the linear programming has to be applied.

(c)   Define transportation problem. Describe its mathematical model.

(d)   Give the characteristics of Operation Research.

(e)   Define Constraints, its applications in Operation Research.

(f)   Give various advantages of Dynamic Programming.

(g)   Explain the least Cost method.

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

(i)   Write a short note on Duality and its application.

(j)   Explain slack and artificial variable.

Section –B
(4x10=40)

Q. 2.   Discus advantages and limitations of Models in Operation research.

Q. 3.   What is decision making under 'uncertainty'? What are the assumptions in decision making under 'uncertainty'?

Q. 4.   Solve the following salesman problem given by following data :

$C_{12} = 20$, $C_{13} = 4$, $C_{14} = 10$, $C_{23} = 5$, $C_{34} = 6$, $C_{25} = 10$, $C_{35} = 6$, $C_{15} = 20$

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

Q. 5.   What is meant by degeneracy in transportation problem? How degeneracy is resolved such problems?

Q. 6. A Small Industry finds from the past data that the cost of making an item is Rs. 25, the selling price of item is Rs. 30 if it is sold within a week, and it could be disposed off at Rs. 20 per item at the end of the week if unsold. Frequency of weekly sales is given below :

Weakly Sales	< 3	4	5	6	7	>8
No. Of weeks	0	10	20	40	30	0

Find the optimum number of items per week the industry should make.

Q. 7. Solve the following LPP by using Big-M method:

Max $Z = -x_1 + 3x_2$

s.t. $x_1 + 2x_2 \geq 2$

$3x_1 + x_2 \leq 3$

$x_1 < 4; x^1, x^2 = 0$.

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