U.G. 5th Semester Examination 2021

Computer Application (B.C.A)

(Honours)

Paper Code : DSE-2

[CBCS]

Full Marks: 32 **Time: 2 hours**

Paper -DSE 2 (E1)

Operation Research

The figures in the margin indicate full marks.

Group -A

Answer any six questions. (2×6 = 12)

1. (a) What do you mean by feasible solution of a Linear Programming Problem (L.P.P.?)?
   (b) When do we say that a problem has unbounded solution?
   (c) What do you mean by cycling in L.P.P.?
   (d) What is balanced transportation problem?
   (e) Define Two Person Zero Sum game.
   (f) Differentiate between PERT and CPM.
   (g) What is slack time in Network diagram?

Group -B

Answer any two questions. (10×2 = 20)

2. a) Make the graphical representation of the set of constraints in the following L.P.P.:

$$\text{Maximize} \quad z = 2x_1 + x_2$$

$$\text{Subject to} \quad x_1 + 3x_2 \leq 15,$$

$$3x_1 - 4x_2 \leq 12,$$

$$x_1, x_2 \geq 0$$

and find the corner points of the region of feasible solutions.

b) Apply simplex method to find the optimal solution of the following L.P.P.:

$$\text{Maximize} \quad z = 4x_1 + 3x_2$$

$$\text{Subject to} \quad 3x_1 + x_2 \leq 15,$$

$$3x_1 + 4x_2 \leq 24,$$

$$x_1, x_2 \geq 0$$

5+5

4. a) Explain the various steps involved in solving transportation problem using

(i) North – West Corner method and

(ii) Matrix Minima Method.

b) The Head of the department has five jobs A, B, C, D, E and five sub-ordinates V, W, X, Y, Z. The number of hours each man would take to perform each job is as follows:

	V	**W**	**X**	**Y**	**Z**
A	3	5	10	15	8
B	4	7	15	18	8
C	8	12	20	20	12
D	5	5	8	10	6
E	10	10	15	25	10

How would the jobs be allocated to minimize the total time?

(2.5+2.5)+5

5. a) For what value of a, the game with the following payoff matrix is strictly determinable?

		B		
		I	**II**	**III**
A	**I**	a	5	2
	II	-1	a	-8
	III	-2	3	a

b) Describe PERT Scheduling technique briefly.

5+5

Paper: DSE 2B (E2)
(Intelligent System)

Full Marks: 32 **Time: 2 Hours**

Group- A

(Answer <u>any Six</u> questions. Each question carries <u>two</u> marks) **[2×6=12]**

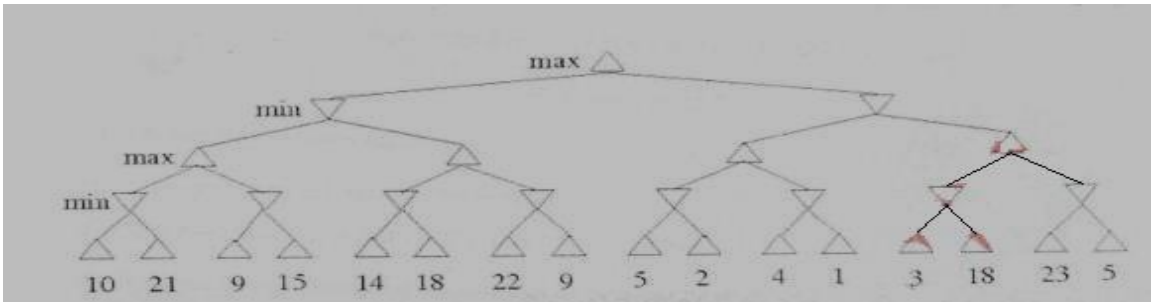
1. a) Differentiate between strong AI and weak AI.
   b) What is agent in artificial intelligence?
   c) Explain Semantic Net.
   d) Why do we need Artificial Intelligence?
   e) Explain Modus Ponens and Modus Tollens.
   f) What is heuristic search?
   g) While creating Bayesian Network, what is the consequence between a node and its predecessors?

Group- B

(Answer any <u>two</u> questions) [10×2=20]

2) a. Explain different Inference Rules for First Order Predicated Logic.
   b. Explain the Resolution algorithm for predicate logic with an example. 6+4=10

3) a. Explain DFS algorithm with example.
   b. Apply Alpha-Beta pruning on following example considering first node as MAX



6+4=10

4) Write short note (any two)
   a) Breath First Search
   b) A* algorithms
   c) Types of Agent 5+5=10