THAKUR COLLEGE OF ENGINEERING AND TECHNOLOGY

S. T. SEMESTER IV (CBCGS-HME 2020) MAY 2022

Subject: Basics of Artificial Intelligence **Branch: AI&ML**

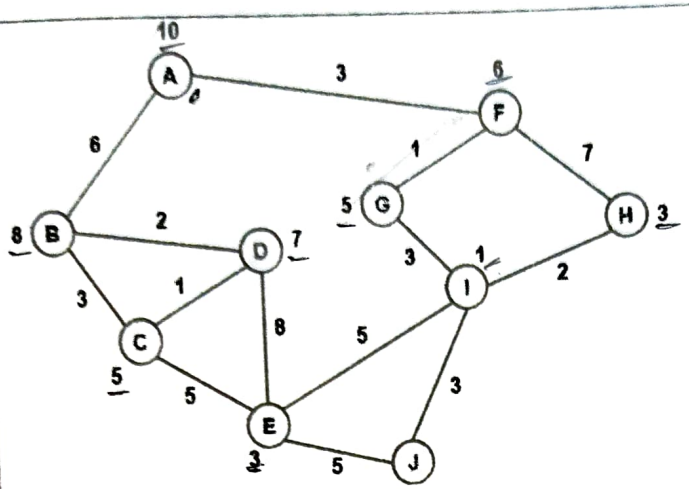
Q.P. Code: B-46003 **Total Marks: 60**

(Time: 2 hours)

Instructions: **1. All Sections are compulsory.**
2. Figures to the right indicate full marks.
3. Assume suitable data if necessary and state the assumptions clearly.

Section-I (08 Marks)		
Q. No.	**Multiple choice question(Answer any 08 questions out of 10)**	**Marks**
1	What is Artificial intelligence? a) Putting your intelligence into Computer b) Programming with your own intelligence c) Playing a Game d) Making a Machine intelligent	1
2	Artificial Intelligence has its expansion in the following application. a) Planning and Scheduling b) Game Playing c) Diagnosis d) All of the mentioned	1
3	What is rational at any given time depends on? a) The performance measure that defines the criterion of success b) The agent's prior knowledge of the environment c) The actions that the agent can perform d) All of the mentioned	1
4	Which one form the following is not blind search a) Breadth First Search b) Iterative Deepening Search c) Bidirectional Search d) Best First Search	1
5	When breadth-first search is optimal? a) When there is less number of nodes b) When all step costs are equal c) When all step costs are unequal d) None of the mentioned	1
6	Knowledge and reasoning also play a crucial role in dealing with _____ environment. a) Completely Observable b) Partially Observable c) Neither Completely nor Partially Observable d) Only Completely and Partially Observable	1
7	A) Knowledge base (KB) is consists of set of statements. B) Inference is deriving a new sentence from the KB. Choose the correct option.	1

	a) A is false, B is false b) A is true, B is true c) A is true, B is false d) A is false, B is true	
8	Following is/are the components of the partial order planning. a) Bindings b) Goal c) Causal Links d) All of the mentioned	1
9	What takes input as an object described by a set of attributes? a) Tree b) Graph c) Decision graph d) Decision tree	1
10	The statement comprising the limitations of FOL is/are _____ a) Expressiveness b) Formalizing Natural Languages c) Many-sorted Logic d) All of the mentioned	1
Section-II (12 Marks)		
	Objective questions(Answer any 4)	
1	Demonstrate Simple Reflexive Agent Structure	3
2	How FOL is Superior then PL to represent knowledge in Knowledgebase	3
3	Compare all informed Search strategies w.r.t algorithmic properties	3
4	Explain Conditional planning with proper example	3
5	What Heuristic function? Discus the concept of Admissible heuristic Function	3
6	Explain Inductive Learning and Rote Learning	3
Section-III (20 Marks)		
	Short Answer question(Answer any 04)	
1	List All types of agents and Explain Goal based agent structure in detail	5
2	What is Problem Formulation? Discover Problem formulation for a) Rout finding Problem b) Water Jug Problem	5
3	Discuss Simple Knowledge Base Agent and explore its working in Expert System	5
4	Demonstrate Total order planning with any example	5
5	What is Learning in AI? Explain Unsupervised Learning with any example	5
6	Explain Limitations and Strengths of any Expert System	5
Section-IV (20 Marks)		
	Long Answer question (answer any 2)	
1	Apply Resolution and backward Chaining algorithms to prove that, Col. West is a criminal w.r.t below problem definition The law says that it is a crime for an American to sell weapons to hostile nations. The country Nono, an enemy of America, has some missiles, and all of its missiles were sold to it by Colonel West, who is American.	10
2	What is Expert System? Explain all components of Expert System and list any 4 applications of Expert system.	10
3	Consider the following graph-	10



~~A~~ F G I J
~~A~~ F H I J

~~A~~B C~~E~~ J
A B D~~E~~ J

6 + 2 + 8

The numbers written on edges represent the distance between the nodes.

The numbers written on nodes represent the heuristic value.

Find the most cost-effective path to reach from start state **A** to final state **J** using A* Algorithm.