Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2024

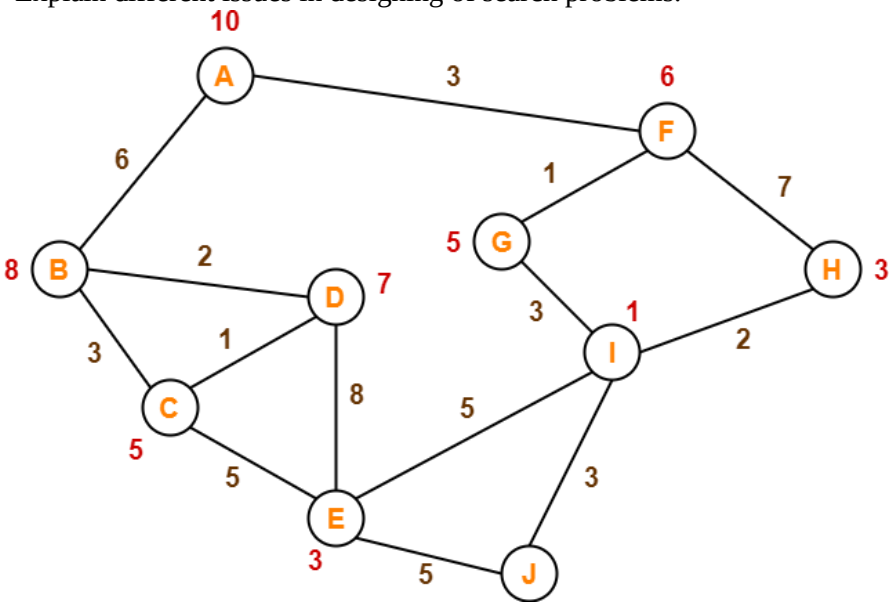
Subject Code: 3161608 **Date:22-05-2024**

Subject Name: Artificial Intelligence

Time: 10:30 AM TO 01:00 PM **Total Marks:70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

Q.1	**(a)**	What is Turing test ?	**03**
	(b)	Difference between Procedural and declarative knowledge.	**04**
	(c)	What is artificial intelligence? Define the different task domains of artificial intelligence.	**07**
Q.2	**(a)**	Define term : Pletue, ridge	**03**
	(b)	Explain different issues in designing of search problems.	**04**
	(c)	 Consider the following graph. 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.	**07**

OR

	(c)	Translate following sentences to predicate logic and prove that "Scrooge is not a child. " 1. Every child loves Santa. 2. Everyone who loves Santa loves any reindeer. 3. Rudolph is a reindeer, and Rudolph has a red nose. 4. Anything which has a red nose is weird or is a clown. 5. No reindeer is a clown. 6. Scrooge does not love anything which is weird.	**07**
Q.3	**(a)**	Explain wumps world problem.	**03**
	(b)	Differentiate Generate and test algorithm with Best First Search algorithm.	**04**
	(c)	What is knowledge base agent in AI? Discuss architecture of AI.	**07**

OR

Q.3	**(a)**	Convert the logical statement to conjunctive normal form 1) Ravi likes all kind of food 2) Apples and chicken are food 3) Anything anyone eats and is not killed is food.	**03**
	(b)	Discuss the different approaches to knowledge representation	**04**
	(c)	If USA + USSR = PEACE. Find P + E + A + C + E.	**07**
Q.4	**(a)**	Explain Hierarchical Planning.	**03**
	(b)	What is goal stack planning? Give example of initial state and goal state in goal stack planning using some predicates.	**04**
	(c)	Explain the State space search with the use of 8 Puzzle Problem.	**07**

OR

Q.4	**(a)**	Describe the axioms of probability theory.	**03**
	(b)	Perform the unification of atomic sentences. (i.e. Find the most general unifier.) 1. p(b, X, f(g(Z))) and p(Z, f(Y), f(Y)). 2. test (11), test(y)	**04**
	(c)	What is production system? Explain it with an example. Discuss the characteristics of a production system.	**07**
Q.5	**(a)**	Explain Alpha-Beta Cut-off method.	**03**
	(b)	Discuss application of statistical learning in AI.	**04**
	(c)	Explain min max procedure for game playing with example	**07**

OR

Q.5	**(a)**	Convert the logical statement $P \leftrightarrow (Q \vee R)$ to conjunctive normal form.	**03**
	(b)	Discuss Bayesian network and its applications.	**04**
	(c)	Write following Prolog programs: 1. To find the greatest variable among the three variables. 2. To count odd and even elements from a list.	**07**

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