Reg. No.															

B.Tech/ M.Tech (Integrated) DEGREE EXAMINATION, MAY 2024
Fourth Semester

21AIS201J – FOUNDATION OF ARTIFICIAL INTELLIGENCE
(For the candidates admitted from the academic year 2022-2023 onwards)

Note:
(i) **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.
(ii) **Part - B** and **Part - C** should be answered in answer booklet.

Time: 3 Hours Max. Marks: 75

PART – A (20 × 1 = 20Marks)
Answer **ALL** Questions

	Marks	BL	CO	PO
1. Which planning algorithm is considered the most straight forward? (A) Best first search (B) State space search (C) Depth first search (D) Hill climbing search	1	4	1	4
2. Though local search algorithm are not systematic, key advantage would include (A) Less memory (B) More time (C) Finds a solution in large infinite space (D) Both (A) and (C)	1	2	1	1
3. Hill climbing algorithm is some times called _____ algorithm because it grabs a good neighbor state without thinking ahead about where to go next (A) Needy local search (B) Heuristic local search (C) Greedy local search (D) Optical local search	1	3	1	3
4. What is heuristic function? (A) A function to solve mathematical problems (B) A function which takes parameters of types string and returns an integer value (C) A function whose return type is nothing (D) A function that maps from problem state descriptions to measure of desirability	1	1	1	1
5. If A then B this can be considered to have a similar logical meaning as the following (A) A → B (B) A < - > B (C) A < - B (D) A = = B	1	4	2	4
6. Which of the following illustrates a mental event in an AI system? (A) Processing sensory data to recognize objects in an image (B) Storing information in long-term memory (C) Sending a signal to actuate a robotic arm (D) Displaying information on a computer screen	1	3	2	3

7. State the purpose of the training process in a neural network 1 1 2 1

(A) To provide network with labeled data
(B) To adjust the weights of connections between neurons
(C) To select appropriate activation function
(D) To visualize the data distribution

8. How new states are generated in genetic algorithm? 1 3 2 3

(A) Composition
(B) Mutation
(C) Cross over
(D) Both (B) and (C)

9. What is the objective of the travelling salesman problem? 1 1 3 1

(A) Maximize the time taken by salesman
(B) Maximize the distance traveled by salesman
(C) Minimize the time taken by salesman
(D) Minimize the distance traveled by salesman

10. In multi agent systems belief of another agent is called 1 4 3 4

(A) Trust
(B) Reputation
(C) Arguments
(D) Strategic approach

11. If agent can make a mutually beneficial agreement, but have conflict of interest about which agreement to make then it is called _____. 1 4 3 4

(A) Strategic approach
(B) Negotiation
(C) Bargaining
(D) Argument among multi agent

12. If you do $\propto$, I will do β is an example of which of the following types of arguments 1 4 3 4

(A) Explanations
(B) Threats
(C) Rewards
(D) Assumption attacks

13. Which of the following statement can be represented using propositional logic? 1 2 4 1

(A) Rohan is intelligent
(B) Some boys like cricket
(C) Some apples are sweet
(D) All boys like cricket

14. Which of the following theorem proving technique is called as proofs by contradictions? 1 2 4 1

(A) Forward chaining
(B) Prolog
(C) Resolution
(D) Backward chaining

15. Machine translation is used to _____. 1 1 4 1

(A) Convert machine language to human language
(B) Convert human language to machine language
(C) Convert human language to English
(D) Convert one human language to local language

16. Automated taxi driver can be related to _____ environment. 1 2 5 1

(A) Deterministic
(B) Stochastic
(C) Non deterministic
(D) Mutation

17.	Robot navigation is an _____. (A) Toy problem (B) Real world problem (C) Combination of toy and real world problem (D) Greedy approach	1	3	5	3
18.	Identify the search technique that combines the benefits of DFS and BFS? (A) Depth limited search (B) Uniform cost search (C) Bidirectional search (D) Iterative search	1	3	5	3
19.	DFS is _____ efficient and BFS is _____ efficient. (A) Space, space (B) Space, time (C) Time, space (D) Time, time	1	4	5	4
20.	Which of the following places would be least likely to include operations robots? (A) Warehouse (B) Factory (C) Hospitals (D) Private homes	1	4	5	4

PART – B (5 × 8 = 40 Marks)
Answer **ALL** Questions

		Marks	BL	CO	PO
21. a.	List the characteristics of artificial intelligence and describe typical intelligent agents used in artificial intelligence.	8	1	1	1
	(OR)				
b.	With a suitable AI game, explain the backtracking search technique.	8	2	1	1
22. a.	Demonstrate alpha-beta pruning algorithm with suitable example.	8	3	2	3
	(OR)				
b.	Discuss the concept of conceptual graphs in artificial intelligence. Explain their structure, components and how they are utilized for knowledge representation.	8	2	2	1
23. a.	For any real time application, sketch and explain the architecture of an intelligent agent.	8	3	3	3
	(OR)				
b.	Demonstrate the concept of multi agent systems, and describe how trust and reputation are achieved in multi agent system.	8	3	3	3
24. a.	Illustrate the concept of frames and semantic networks in knowledge representation.	8	4	4	4
	(OR)				
b.	Experiment ant colony optimization with real-time AI problem with suitable illustrations.	8	4	4	4
25. a.	Implement neural networks in artificial intelligence, discuss their architecture, learning algorithms and applications. Provide examples for how neural networks are used in real world scenarios.	8	3	5	3

(OR)

b.	In detail explain the process of hill climbing and simulated annealing with example.	8	1	5	1

PART – C (1 × 15 = 15 Marks)
Answer **ANY ONE** Question

		Marks	BL	CO	PO
26.	Consider the following axioms: (i) Ravi likes all kind of food (ii) Apples and chicken are food (iii) Anything anyone eats and its not killed is food (iv) Ajay eats peanuts and is still alive (v) Rita eats everything and is still alive Prove by resolution that Ravi likes peanuts.	15	4	2	4
27.	Demonstrate the challenges and future directions of formal concept analysis in the context of artificial intelligence research. Identify potential areas for improvement and expansion of FCA techniques and applications. Describe a scenario where formal concept analysis might face challenges or limitations an AI applications.	15	3	4	3

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