b.	How to define a problem as state space search? Discuss it with the help of an example.	12	3	2	2
29. a.	Discuss the following search technique with the help of an example. Also discuss the benefits and shortcoming of each (i) Breadth first search (ii) Depth first search	12	3	2	2
	(OR)				
b.	Write the constraint satisfaction procedure. Trace the execution of the constraint satisfaction procedure in solving crypto-arithmetic problem.	12	4	2	1
30. a.i.	Discuss about alpha beta pruning with appropriate example and specify the importance of the same.	6	3	3	2
ii.	Illustrate the condition under which this alpha beta pruning could be done.	6	3	3	2
	(OR)				
b.	Explain unification algorithm used for reasoning under predicate logic with example.	12	3	3	2
31. a.	Discuss about Bayesian theory and Bayesian network.	12	3	3	2
	(OR)				
b.	Consider the problem of solving an instance of the 8 puzzle. Discuss the search process on the production system model by forward and backward reasoning.	12	4	4	2
32. a.	Discuss about the knowledge acquisition process in expert systems.	12	3	5	2
	(OR)				
b.	Write down strips-style operators that correspond to the following blocks word description. A | On (A, B, S0)^ B | On Table (B, S0)^ Clear (A, S0)	12	4	5	2

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Reg. No.														

B.Tech. DEGREE EXAMINATION, MAY 2023
Sixth Semester

18CSC365J – ARTIFICIAL INTELLIGENCE
(For the candidates admitted during the academic year 2018-2019 to 2021-2022)

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 & Part - C** should be answered in answer booklet.

Time: 3 hours Max. Marks: 100

		Marks	BL	CO	PO
	PART – A (20 × 1 = 20 Marks) Answer **ALL** Questions				
1.	Which term is used to describe the component of issues solving that is judgmental or commonsense in nature? (A) Heuristic (B) Critical (C) Value based (D) Analytica	1	1	1	1
2.	The concept of tailoring the teaching techniques to the learning patterns of individual students is called as _____. (A) Decision support (B) Automatic pogromming (C) Intelligent computer assisted instruction (D) Expert systems	1	2	1	1
3.	Artificial intelligence is classified based on which of the following characteristics? (A) Based on functionally only (B) Based on capabilities only (C) Based on functionally and capabilities (D) It is not categorized	1	1	1	1
4.	In the field of natural language processing, what are the two subfields? (A) Asymbolic and numeric (B) Time and motion (C) Algorithm and heuristic (D) Understanding and generation	1	1	2	2
5.	Select the functionality which is used for avoiding the local optimum (A) Cross over (B) Mutation (C) Recombination (D) Reproduction	1	2	2	1
6.	The type of the results depends on the players which will decide the final result is_____. (A) Normal search (B) Adversarial search (C) Linear search (D) Sequential search	1	1	2	2
7.	Time complexity of min max algorithm is _____. (A) O (b^d) (B) O (a_n) (C) O (Ab^c) (D) O (ab)	1	2	2	1

8. _____ combines the small memory foot print of DFS and has the completeness guarantee of BFS — 1 2 2 2
   (A) Iterative deepening search (B) Depth limited search
   (C) Uniform cost search (D) Depth first search

9. Which search algorithm imposes a fixed depth limit on nodes? — 1 2 2 1
   (A) Breadth first search (B) Depth first search
   (C) Depth limited search (D) Bidirectional search

10. What is/are taken into account of state space search? — 1 2 2 2
   (A) Post conditions (B) Pre conditions
   (C) Effects (D) Both preconditions and effects

11. Which of the following algorithm keeps track of K states instead of just one? — 1 1 2 1
   (A) Hill-climbing search (B) Local beam search
   (C) Stochastic Hill-climbing search (D) Random restart Hill-climbing search

12. _____ values is/are independent in min-max search algorithm. — 1 2 2 2
   (A) Pruned leaves X and Y (B) Every state
   (C) Root (D) Root state

13. Fuzzy logic is represented _____. — 1 2 3 2
   (A) As if-then-else rules (B) As if-then rules
   (C) Both as if-then-else rules and as if-then rules (D) Nested if

14. When BEL(A) denotes belief of event A, then according to Dempster Shaffer Theory (DST): _____. — 1 3 3 2
   (A) BEL(A) + BEL (~A) < = 1 (B) BEL(A) + BEL (~A) = 1
   (C) BEL(A) + BEL (~A) > = 1 (D) BEL(A) + BEL (~A) = 0

15. Bayes theorem is _____. — 1 2 4 1
   (A) Way of calculating a conditional probability without the joint probability (B) Way of calculating a conditional probability with the joint probability
   (C) Way of calculating a conditional probability without the marginal probability (D) Way of calculating a conditional probability with the marginal probability

16. "You need to go for a movie with friends at 6.30 PM. One of your friends intends to join with you from your home. You plan to start from your home 'X' minutes before the movie. You are estimating that 'X' minutes is insufficient to be on time. However your partial information about your friends plan" – This type of knowledge is an example for _____. — 1 1 4 1
   (A) Procedural (B) Declarative
   (C) Heuristic (D) Uncertain

17. Assume: — 1 1 4 1
   A: Patient has liver disease P(A) = 0.10
   B: Patient is an alcoholic; P(B) = 0.05
   B/A: The probability that a patient is alcoholic, given that they have liver disease, is 7%; P(B/A) = 0.07, _____ is the patient's probability of having liver disease if they are an alcoholic
   (A) 0.10 (B) 0.15
   (C) 0.14 (D) 0.12

18. Identity the method that is not used in probabilistic reasoning while the environment is not static — 1 2 3 1
   (A) Bayesian Belief network (B) Gaussian distribution
   (C) Monte Carlo algorithm (D) Markov process

19. _____ is the ability to acquire new knowledge using automatic methods wherever possible rather than reliance on human intervention — 1 1 5 1
   (A) Representation adequacy (B) Inferential adequacy
   (C) Inferential efficiency (D) Acquisitional efficiency

20. If a hypothesis says it should be positive, but in fact it is negative, we call it _____. — 1 1 5 1
   (A) A consistent hypothesis (B) A false negative hypothesis
   (C) A false positive hypothesis (D) A specialized hypothesis

PART – B (5 × 4 = 20 Marks) — Marks BL CO PO
Answer **ANY FIVE** Questions

21. Discuss how do we measure if artificial intelligence is acting like a human. — 4 3 3 3

22. Develop the agents problem and discuss with its environment. — 4 3 3 3

23. How to define optimality and completeness in uniformed search methods-breadth first search? — 4 1 2 2

24. Narrate adversarial search problem in detail with example. — 4 3 3 2

25. Develop a recursive MinMax algorithm and explain in steps with example. — 4 4 4 3

26. Discuss conflict resolution preferences based on object with example. — 4 4 5 2

27. Design a problem solving scenario and solve using forward state space search. — 4 4 4 2

PART – C (5 × 12 = 60 Marks) — Marks BL CO PO
Answer **ALL** Questions

28. a. What is "Artificial Intelligence and Artificial Intelligence Technique"? Briefly explain how AI technique can be represented and list out some of the task domain of AI. — 12 3 1 1

(OR)