

BALLARI INSTITUTE OF TECHNOLOGY & MANAGEMENT

(Autonomous Institute under Visvesvaraya Technological University, Belagavi)

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Course Code

22CS/CD53

Fifth Semester B.E. Degree Examinations, February 2025

ARTIFICIAL INTELLIGENCE

(Common to CSE & CSE-DS)

Duration: 3 hrs

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Missing data, if any, may be suitably assumed

<u>Q. No</u>	<u>Question</u>	<u>Marks</u>	<u>(RBTL:CO:PI)</u>
<u>Module-1</u>			
1.	a. Define AI? Outline the four different types of approaches related to AI.	08	(2 : 1 : 1.6.1)
	b. With a neat diagram discuss how the agents interact with an environment using suitable example.	06	(2 : 1 : 2.5.1)
	c. List and outline the different properties of task environment.	06	(2 : 1 : 2.5.1)
(OR)			
2.	a. What is PEAS? Explain with an example of different agent types and their PEAS descriptions.	08	(2 : 1 : 1.6.1)
	b. List any five types of foundations of AI and explain the same with an example.	06	(2 : 1 : 1.6.1)
	c. Differentiate between goal based agent vs utility based agent with suitable example.	06	(2 : 1 : 2.6.4)
<u>Module-2</u>			
3.	a. Analyse the problem solving steps involved in an eight puzzle problem and briefly discuss the same.	06	(3 : 2 : 2.8.1)

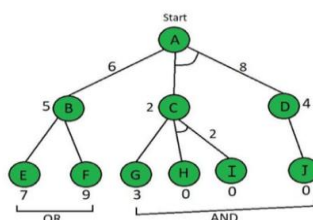
1	2	3
5	6	
7	8	4

Initial state

1	2	3
5	8	6
	7	4

Goal state

- b. Outline the significance of A* ALGORITHM in heuristics search techniques. 06 (3 : 2 : 2.8.1)
- c. List and explain the steps involved in Constraint Satisfaction Problems (CSP). 08 (2 : 2 : 2.8.1)
- (OR)**
4. a. Apply AO* search algorithm for the given AND-OR graph and obtain the solutions. 08 (3 : 2 : 2.7.1)



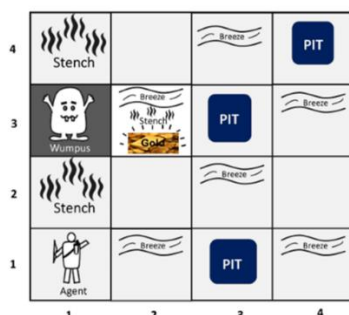
- b. Illustrate the hill climbing problems with help of State-space diagram. 06 (3 : 2 : 2.7.1)
- c. Apply the means-ends analysis algorithm and show how the goal state is reached for the given problem. 06 (3 : 2 : 2.7.1)

Module-3

5. a. List the various types of knowledge used in A.I with suitable example. 08 (2 : 3 : 2.7.1)
- b. List and discuss about the syntax rules used in first order predicate logic. 06 (2 : 3 : 1.2.2)
- c. Compare and contrast universal quantifier and existential quantifier with an example. 06 (3 : 3 : 2.6.5)

(OR)

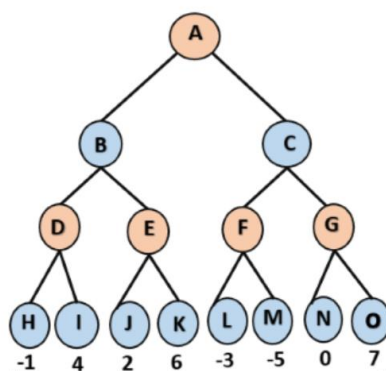
6. a. Apply the Wumpus world problem for the given 4×4 Grid and obtain the solution for the same. 08 (3 : 3 : 2.7.1)



- b. Differentiate between forward reasoning and backward reasoning. 06 (3 : 3 : 1.2.2)
- c. Translate the following English sentences to propositional logic. 06 (3 : 3 : 1.2.2)
- Propositions:
- (i) (R)aining and Liron is (S)ick,
 - (ii) Liron is (H)ungry,
 - (iii) Liron is (HA)ppy,
 - (iv) Liron owns a (C)at,
 - (v) Liron owns a (D)og

Module-4

7. a. Apply the non-monotonic reasoning for ABC Murder mistry story 08 (3 : 4 : 1.2.1)
- b. Outline the significance of semantic network and discuss about the partitioned semantic nets. 06 (3 : 4 : 2.8.1)
- c. Apply Minimax algorithm for the following given graph. 06 (3 : 4 : 2.8.1)



(OR)

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|----|----|---|-----------|-----------------------|
| 8. | a. | Apply Bayesian statistics theory for solving the medical diagnosis problem and discuss the same. | 08 | (3 :4 : 1.2.2) |
| | b. | List and discuss about the different approaches used in the default reasoning. | 06 | (2 :4 : 1.2.2) |
| | c. | Outline the significance of conceptual dependency. Apply the same for the sentence: <i>Since smoking can kill you, I stopped.</i> | 06 | (2 :4 : 1.7.1) |

Module-5

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|----|----|--|-----------|-----------------------|
| 9. | a. | Outline the usage of Bayesian networks and discuss about the semantics of the Bayesian network. | 10 | (2 :5 : 2.8.2) |
| | b. | Apply the Bayes rule for the simple case and combined evidence case for the patient monitoring system. | 10 | (3 :5 : 2.8.1) |

(OR)

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|-----|----|--|-----------|-----------------------|
| 10. | a. | Outline the different methods used in representing knowledge in an uncertain domain and also discuss its applications. | 10 | (2 :5 : 1.2.2) |
| | b. | Outline the significance of Bayesian belief networks with a suitable example. | 10 | (2 :5 : 2.8.1) |

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