



B.E. DEGREE EXAMINATIONS: APRIL / MAY 2023

(Regulation 2018)

Fourth Semester

INFORMATION SCIENCE AND ENGINEERING

U18IST4004: Artificial Intelligence

COURSE OUTCOMES

CO1: Develop solutions for problems using various Artificial Intelligence concepts.

CO2: Design applications using PROLOG for making inferences.

CO3: Demonstrate usage of planning and decision making.

CO4: Apply the concepts of learning using Tensor Flow and any other programming language.

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 2 = 20 Marks)

(Answer not more than 40 words)

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|---|-----|-------------------|
| 1. Identify the capabilities that a computer need to possess to be intelligent. | CO1 | [K ₁] |
| 2. Define Problem formulation. | CO1 | [K ₁] |
| 3. Relate informed and uninformed search strategies. | CO1 | [K ₂] |
| 4. Identify the incremental formulation for 8 queen problem. | CO2 | [K ₃] |
| 5. Develop the following in propositional logic.
"If it is cold and cloudy, then it is raining". | CO2 | [K ₃] |
| 6. Construct first order logic sentence for the following.
Brothers are siblings. | CO3 | [K ₃] |
| 7. Define recurrent neural network. | CO3 | [K ₁] |
| 8. The following sentence involves uncertainty. Justify.
Toothache ⇒ Cavity. | CO4 | [K ₃] |
| 9. Differentiate reinforcement learning and supervised learning. | CO4 | [K ₂] |
| 10. What is convolution neural network? | CO4 | [K ₁] |

Answer any FIVE Questions:-

PART B (5 x 16 = 80 Marks)

(Answer not more than 400 words)

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| 11. Describe different Structure of Agents with agent program and appropriate diagram. | 16 | CO1 | [K ₂] |
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12.	Demonstrate Forward chaining with suitable example.	16	CO2	[K ₂]
13.	Construct planning graph for the “have cake and eat cake too” problem and Explain.	16	CO3	[K ₃]
14.	Build a decision tree to decide whether to wait for a table at a restaurant. Consider the following list of attributes as part of the input: <ol style="list-style-type: none"> 1. Alternate: whether there is a suitable alternative restaurant nearby. 2. Bar : whether the restaurant has a comfortable bar area to wait in. 3. Fri/Sat: true on Fridays and Saturdays. 4. Hungry: whether we are hungry. 5. Patrons: how many people are in the restaurant (values are None, Some, and Full). 6. Price: the restaurant’s price range (\$, \$\$, \$\$\$). 7. Raining: whether it is raining outside. 8. Reservation: whether we made a reservation. 9. Type: the kind of restaurant (French, Italian, Thai, or burger). 10. Wait Estimate: the wait estimated by the host (0–10 minutes, 10–30, 30–60, or >60). 	16	CO4	[K ₃]
15.	Summarize Single-layer feed-forward neural networks in detail.	16	CO1	[K ₂]
16.	a) Demonstrate a decision network with an example and write the algorithm for evaluating decision networks.	8	CO3	[K ₃]
	b) Show that how both laziness and ignorance in an operation affects the degree of approximation in the following problem using Bayesian network. You have a new burglar alarm installed at home. It is fairly reliable at detecting a burglary, but also responds on occasion to minor earthquakes. (This example is due to Judea Pearl, a resident of Los Angeles—hence the acute interest in earthquakes.) You also have two neighbors, John and Mary, who have promised to call you at work when they hear the alarm. John nearly always calls when he hears the alarm, but sometimes confuses the telephone ringing with the alarm and calls then, too. Mary, on the other hand, likes rather loud music and often misses the alarm altogether. Given the evidence of who has or has not called, we would like to estimate the probability of a burglary.	8	CO4	[K ₃]
