

PAPER CODE	V313-2101-ESB
---------------	---------------

DECEMBER 2023 (END SEM EXAM)
TY INFORMATION TECHNOLOGY (SEMESTER - I)
COURSE NAME: ARTIFICIAL INTELLIGENCE
COURSE CODE: ITUA31201
(PATTERN 2020)

Time: [1Hr. 30 Min]

[Max. Marks: 40]

Instructions to candidates:

- 1) Figures to the right indicate full marks.
- 2) Use of scientific calculator is allowed.
- 3) Use suitable data wherever required.
- 4) All questions are compulsory. Solve any one sub question from Question 3 and any two sub questions each from Questions 4,5 and 6 respectively.

Q. No.	Question Description	Max. Marks	CO mapped	BT Level
Q.1	a) Comment on problem solving approach to AI.	[2]	[1]	[2]
Q2	b) Arrange four 6-sided cubes in a row, with each side of each cube painted one of four colors, such that on all four sides of the row one block face of each color are showing (Solve using Generate and test heuristic approach)	[2]	[2]	[3]
Q3.	<p>a) Consider the following axioms:</p> <ol style="list-style-type: none"> 1. All hounds howl at night. 2. Anyone who has any cats will not have any mice. 3. Light sleepers do not have anything which howls at night. 4. John has either a cat or a hound. 5. (Conclusion) If John is a light sleeper, then John does not have any mice. Prove the conclusion using resolution. <p>b) Compare and contrast different approaches to knowledge representation, such as structured representation, logical representation, semantic networks, and rule-based systems.</p>	<p>[6]</p> <p>[6]</p>	<p>[3]</p> <p>[3]</p>	<p>[3]</p> <p>[3]</p>
Q.4	a) There are 3 boxes. B1 has 2 white, 3 black and 4 red balls. B2 has 3 white, 2 black and 2 red balls. B3 has 4 white, 1 black and 3 red balls. A box is chosen at random and 2 balls are drawn. 1 is white and other is red. What is the probability that they came from the first box?? (Solve using	[5]	[4]	[3]

	<p>Baye's Rule)</p> <p>b) Compare and contrast different planning strategies such as goal-stack planning, non-linear planning, hierarchical planning</p> <p>c) "In the medical center, If a patient has a fever, they have a viral infection. If a patient has a cough, they have a respiratory infection. Ram having 104-degree Celsius fever." Prove that "Ram don't have respiratory infection." Apply the Forward chaining inference approach.</p>	[5]	[4]	[3]
		[5]	[4]	[4]
Q.5	<p>a) Discuss how explanation-based learning approach can be used with Robot Navigation and Medical Diagnosis</p> <p>b) Predicate an expert system for DART. Define following components in the above expert system:</p> <ul style="list-style-type: none"> i) Human Expert ii) Knowledge Engineer iii) Knowledge Base iv) Inference Engine v) Inferences vi) User (May not be an expert). <p>c) Create an Expert system for detecting fraud signatures</p>	[5]	[5]	[2]
		[5]	[5]	[4]
		[5]	[5]	[4]
Q.6)	<p>a) Provide examples illustrating the applications of AI in various fields based on the described concepts in NLP, information retrieval, computer vision, and robotics.</p> <p>b) Discuss the challenges and approaches in machine translation. How do machine translation systems translate text from one language to another?</p> <p>c) Outline the steps involved in the NLP process, from text understanding to generation. How do these steps facilitate effective language processing?</p>	[5]	[6]	[3]
		[5]	[6]	[3]
		[5]	[6]	[3]