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BRAINWARE UNIVERSITY

Term End Examination 2025-2026
Programme – BCA(MAWT)-Hons-2024
Course Name – Artificial Intelligence
Course Code - BMT30002
(Semester III)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) List an application of AI in navigation.

a) Route Optimization b) Book Printing
c) Manual Typing d) Paper Folding

(ii) Name a type of state space representation.

a) Graph b) Table
c) List d) All of these

(iii) Recall a component of an agent's environment.

a) Actuator b) Keyboard
c) Monitor d) Mouse

(iv) Recognize the main function of a sensor in an agent.

a) Receive Input b) Print Output
c) Store Data d) Send Email

(v) Label the type of agent that acts only on current percept.

a) Simple Reflex Agent b) Model-Based Agent
c) Learning Agent d) Goal-Based Agent

(vi) Differentiate between a static and dynamic environment.

a) Dynamic changes b) Static changes
c) Both change d) Neither change

(vii) Identify the function of Goal based Agent

a) Acts towards goals b) Only reacts
c) Only stores data d) Only prints

(viii) Distinguish between autonomous and non-autonomous agents.

a) Autonomous acts independently b) Non-autonomous acts independently
c) Both are independent d) Neither are independent

(ix) Contrast episodic and sequential environments.

a) Episodic: independent steps
b) Sequential: independent steps
c) Both are independent
d) Neither are independent

(x) Select the roles of sensor and actuator in an agent.

a) Sensor: input, Actuator: output
b) Both are input
c) Both are output
d) Sensor: output, Actuator: input

(xi) Differentiate between frames and scripts.

a) Frames: objects, Scripts: events
b) Both represent events
c) Both represent objects
d) None

(xii) Classify the knowledge type: "how to ride a bicycle."

a) Procedural
b) Declarative
c) Semantic
d) Explicit

(xiii) Order the following reasoning types by increasing complexity: rule-based, model-based, case-based.

a) Rule-based, Case-based, Model-based
b) Model-based, Rule-based, Case-based
c) Case-based, Rule-based, Model-based
d) Case-based, Model-based, Rule-based

(xiv) Group the following as syntactic processing tasks: parsing, POS tagging, translation, word sense disambiguation.

a) Parsing, POS tagging
b) Translation, parsing
c) Word sense disambiguation, parsing
d) Translation, POS tagging

(xv) Select the correct example of semantic ambiguity.

a) Bank (river or money)
b) Cat (animal)
c) Tree (plant)
d) Book (object)

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Distinguish between rule-based reasoning and case-based reasoning. (3)
3. Differentiate between coreference resolution and named entity recognition. (3)
4. Summarize the function of parsing in syntactic processing. (3)
5. Let: A={(1,0.2),(2,0.6),(3,0.7)} B={(1,0.8),(2,0.4),(3,0.5)} Find: AUB? (3)
6. Create a knowledge representation structure for a self-driving car agent, integrating at least three types of knowledge discussed in the syllabus. (3)

OR

Develop a scenario where you modify an existing semantic network to incorporate new knowledge about electric vehicles in a city's transportation system. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Explain how frames are used to represent structured knowledge in artificial intelligence. (5)
8. Classify the main types of knowledge that need to be represented in AI, and examine how each type supports intelligent reasoning. (5)
9. Compare semantic network and frame representation techniques, and detect scenarios where one is more advantageous than the other in organizing knowledge for AI systems. (5)
10. Differentiate between first order logic and semantic networks as knowledge representation methods. (5)
11. Summarize how alpha-beta pruning improves the minimax algorithm in game playing. (5)
12. Create a semantic network to represent the relationships among the concepts “doctor,” “hospital,” “patient,” and “disease.” Explain how this structure supports reasoning in a medical expert system. (5)

OR

Modify a rule-based reasoning system for medical diagnosis to incorporate probabilistic inference using Bayesian networks. Describe the benefits of this modification. (5)

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