BRAINWARE UNIVERSITY

Term End Examination 2024-2025
Programme – B.Tech.(CSE)-AIML-2021
Course Name – AI with Robotics
Course Code - OEC-CSM701A
(Semester VII)

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) Select the year regarding the first servomotor actuation and microcomputer-controlled robots commercially launch process happened.
a) 1959 b) 2001
c) 1999 d) 1974

(ii) Describe of the robot as "A reprogrammable, multifunctional manipulator designed to move material through variable programmed motions for performance of a variety of tasks "defined by _____
a) British Robot Association b) ISO
c) JAPANESE Industrial Ro d) Robotics Industries Association

(iii) Please Explain, the term is not present in open-loop system
a) Plot b) Input
c) Output d) Feedback

(iv) Determine the task level programming in Robotics
a) Programming the specific movements of each robot joint
b) Specifying high-level tasks for the robot to perform, leaving the system to generate the necessary low level instructions
c) Direct control of the robot's hardware components
d) Creating low-level machine code to run on the robot

(v) Select two types of logic statements use in Horn clauses?
a) Implications and negations b) Constants and variables
c) Facts and rules d) Actions and effects

(vi) Select the feature that differentiates Partitioned Nets from Semantic Nets.

a) Partitioned nets handle dynamic knowledge
b) Partitioned nets divide knowledge into clusters
c) Semantic nets are more structured
d) Partitioned nets use temporal reasoning

(vii) Identify the type of reasoning does forward chaining use?
a) Deductive reasoning
b) Inductive reasoning
c) Abductive reasoning
d) Default reasoning

(viii) Identify AI technique is used for mimicking the way humans process and understand natural language.
a) Genetic Algorithms
b) Reinforcement Learning
c) Natural Language Processing
d) Deep Learning

(ix) Identify In Tic-Tac-Toe, number of cells are in the game grid
a) 5
b) 6
c) 7
d) 9

(x) Select from the following that Transforms the fuzzy value into the crisp value.
a) de-fuzzification Module
b) knowledge base
c) both of these
d) knowledge base

(xi) State that Explanation-Based Learning (EBL) is example of which learning
a) Inductive learning
b) Machine Learning
c) Supervised learning
d) Unsupervised learning

(xii) Enumerate The set of limitations become as set of rules to find problem's solution known as
a) Constraints Satisfaction Problems
b) Uninformed Search Problems
c) Local Search Problems(
d) All of the mentioned

(xiii) Interpret that the statement "The room temperature is hot" here the 'hot' can be represented by
a) Fuzzy set
b) Crisp set
c) Both fuzzy and crisp set
d) None of these

(xiv) Identify Explanation-Based Learning (EBL) is example of which of the following
a) Inductive learning
b) Deductive learning
c) Supervised learning
d) Unsupervised learning

(xv) Choose Logic programming languages, such as Prolog, are based on which type of knowledge representation?
a) Procedural knowledge
b) Declarative knowledge
c) Control knowledge
d) Probabilistic knowledge

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Describe environment in the context of agent-based systems and provide an example of a simple environment. (3)
3. Describe 4 common Robot Programming Challenges. (3)
4. Examine how does Breadth-First Search (BFS) guarantee finding the shortest path in an unweighted graph? (3)
5. Explain a popular dimensionality reduction algorithm. (3)
6. Justify an example of a real-world application of rule-based systems. (3)

OR

Evaluate the difference between a semantic network and a conceptual graph (3)

Group-C
(Long Answer Type Questions) 5 x 6=30

7. Explain the LAO* and LA* algorithms, analyzing their application in AI problem-solving and their effectiveness in optimizing search strategies. (5)
8. Analyze the the goals of time series analysis in AI. (5)
9. Explain syntactic processing in NLP. (5)
10. Illustrate robot as mechanism (5)
11. Evaluate the challenges and benefits of using AI in expert systems for robotics. (5)
12. Analyze the differences between frames and semantic nets as knowledge representation techniques. (5)

OR

Explain the role of resolution in knowledge representation and its application in automated reasoning. (5)

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