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BRAINWARE UNIVERSITY

Term End Examination 2024-2025
Programme – B.Tech.(RA)-2021/B.Tech.(RA)-2023
Course Name – Artificial Intelligence in Robotics
Course Code - PCC-ECR401
(Semester IV)

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) Identify the instruments that are used for perceiving and acting upon the environment
   a) Sensors and Actuators b) Sensors
   c) Perceiver d) None of these

(ii) Select the factor that is used to improve the agents performance
   a) Perceiving b) Learning
   c) Observing d) visualizing

(iii) Report, how many types of agents are there in artificial intelligence?
   a) 1 b) 2
   c) 3 d) 4

(iv) Indicate, the main task of a problem-solving agent.
   a) Solve the given problem and reach to goal b) To find out which sequence of action will get it to the goal state
   c) Both Solve the given problem and reach to goal and To find out which sequence of action will get it to the goal state d) None of these.

(v) Describe The structure of an agent.
   a) Agent = Architecture / Agent Program b) Agent = Architecture * Agent Program
   c) Agent = Architecture + Agent Program d) Agent = Architecture - Agent Program

(vi) Identify When agents select actions on the basis of preference for each state, called
   a) Model based reflex agents b) Goal based agents
   c) Utility based agents d) Simple agent

(vii) Identify where one real and other artificial agents are simultaneously tested on the basis of equal ground?
   a) Utility based Test environment b) Turing Test environment
   c) Model based Test environment d) None of these

(viii) Identify Which search strategy is also called as blind search?

a) Uninformed search b) Informed search
c) Adversarial search d) Binary search

(ix) Indicate the Set of actions for a problem in a state space is formulated by a
a) Intermediate state b) Initial state
c) Successor function, which takes current action and returns next immediate state d) None of these

(x) Identify the State space in artificial intelligence belongs to
a) complete problem b) your definition to a problem
c) Problem that you design d) Representing your problem with variable and parameter

(xi) Classify Which agent enables the deliberation about the computational entities and actions?
a) Hybrid b) Reflective
c) Relational d) Simple

(xii) Identify Major component/components for computing the performance of problem solving.
a) Completeness b) Optimality
c) Time and Space complexity d) All of these

(xiii) Select A search technique that combines the strengths of uniform-cost search and greedy search_____.
a) It is not optimal b) A* graph Search
c) A* Tree Search d) None of these

(xiv) Select from the options: Space complexity for Uniform Cost search_____.
a) bd/2(b: no. of node, d: depth) b) bd(b: no. of node, d: depth)
c) bd/3(b: no. of node, d: depth) d) b2d(b: no. of node, d: depth)

(xv) Estimate: In water jug problem, the rule Pour water from 3-gallon jug into 4-gallon jug until 4-gallon jug is full, is represented as :
a) (X+Y,0) b) (0,X+Y)
c) (X-(3-Y),3) d) (4,Y-(4-X))

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Describe about Branch and Beam search. (3)

3. Discuss the features of hill-climbing algorithm. (3)
4. Explain the important learning strategies in ANN. (3)
5. Mention the advantages and disadvantages of Greedy Best First Search Algorithm. (3)

6. Explain some applications of NLP. (3)

OR

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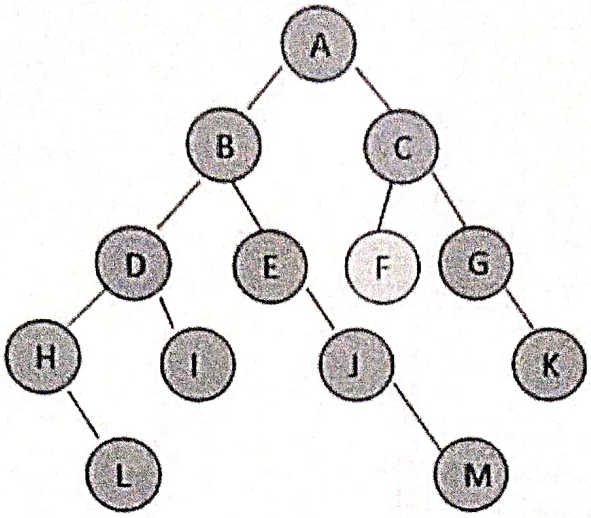

Illustrate the BFS to solve the above problem considering Initial node A and Goal node F.

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Describe parametric and non-parametric models in AI. (5)
8. Describe the Steepest – Ascent hill climbing and stochastic hill climbing algorithms. (5)
9. Mention the functions that AI teaches the Robots. (5)
10. Explain Intelligent Agents by mentioning its use. (5)
11. Name and describe the main features of Genetic Algorithms. (5)
12. Justify: The arithmetic operations are done in Prolog. (5)

OR

Justify: Prolog is restricted to Horn clauses. (5)

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