Paper / Subject Code: 82901 / Artificial Intelligence

Time: 2 ½ Hours   **Total Marks: 75**

N.B. 1) All questions are compulsory.
2) Figures to the right indicate marks.
3) Illustrations, in-depth answers and diagrams will be appreciated.
4) Mixing of sub-questions is not allowed.

Q. 1   Attempt All
(a)   Multiple Choice Questions   (10M)

     I.   An AI system is composed of?
         A. Agent
         B. Environment
         C. Both A and B
         D. None

    II.   Which of the following is not a type of agents in artificial intelligence?
         A. Utility
         B. Model
         C. Simple
         D. Target

   III.   Rationality of an agent does not depend on?
         A. Performance measures
         B. Percept sequence
         C. Reaction
         D. Action

   IV.   In which ANN, loops are allowed?
         A. Feedforward ANN
         B. Feedback ANN
         C. Both A and B
         D. None

     V.   What is purpose of Axon?
         A. Receptors
         B. Transmission
         C. Transmitter
         D. None of the above

   VI.   The _____ for an agent specifies the action taken by the agent in response to any percept sequence.
         A. agent function
         B. Agent program
         C. Agent structure
         D. None of the above

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VII. To pass the total Turing test the computer will need _____
   A. Robotics
   B. Computer Vision
   C. Both A and B
   D. None of the above

VIII. _____ expands shallowest unexpanded node first.
   A. Breadth First Search
   B. Depth First Search
   C. IDA
   D. A*

IX. The _____, which determines whether a given state is a goal state.
   A. Goal test
   B. Path test
   C. Agent test
   D. None of the above

X. How the decision tree reaches its decision?
   A. Single test
   B. Two test
   C. Sequence of tests
   D. No test

(b) Fill in the blanks (lm , Multiple Linear Model, Problem, Solution, Activation,   (5M)
    Evidence)
   I. A search algorithm takes _____ as an input and returns _____
      as an output.
   II. Function used for linear regression in python is _____
   III. When there are more than one independent variables in the model, then
        the linear model is termed as _____
   IV. The process of adjusting the weight in Neural Network is known as
       _____
   V. In Bayes Theorem, unconditional probability is called as_____

Q. 2 Attempt the following (Any THREE)   (15M)
 (a) What are Uninformed strategies? Explain any one in detail.
 (b) Explain Agent structure in detail.
 (c) What is well defined problem and solutions explain for Romanian map?
 (d) What is PEAS? Explain with two suitable examples.
 (e) List and explain the categories of definition of AI.
 (f) Write short note on Greedy Best First Search.

Q. 3   Attempt the following (Any THREE) (15M)
(a)   Write short note on overfitting in decision tree.
(b)   What is entropy? How we calculate it?
(c)   Explain Artificial Neural Network.
(d)   What is Logistic regression explain with the help of an example.
(e)   Explain Support vector machine and its properties.
(f)   What is ensemble learning? How bagging algorithm works?

Q. 4   Attempt the following (Any THREE) (15M)
(a)   Explain maximum likelihood parameter learning for continuous model.
(b)   What is reinforcement learning? Explain in detail.
(c)   What are beta distributions explain with the example.
(d)   What is EM algorithm? Explain its steps.
(e)   Explain Naïve Bayes algorithm.
(f)   Write short note on Hidden Markov Model.

Q. 5   Attempt the following (Any FIVE) (15M)
(a)   Explain the concept of goal-based agent.
(b)   How to measure problem solving performance?
(c)   What is linear regression? State its types.
(d)   How supervised learning algorithm works explain with example?
(e)   What is statistical learning?
(f)   Explain any one application of Reinforcement learning?
(g)   Explain Heuristic function.
(h)   Write short note on Non parametric model.

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