Code: AC74/AT74/AC123/AT123
Subject: ARTIFICIAL INTELLIGENCE & NEURAL NETWORKS

AMIETE – CS/IT (Current & New Scheme)

Time: 3 Hours   **DECEMBER 2018**   **Max. Marks: 100**

PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.

NOTE: There are 9 Questions in all.

- **Question 1 is compulsory and carries 20 marks. Answer to Q. 1 must be written in the space provided for it in the answer book supplied and nowhere else.**
- **The answer sheet for the Q.1 will be collected by the invigilator after 45 minutes of the commencement of the examination.**
- **Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.**
- **Any required data not explicitly given, may be suitably assumed and stated.**

Q.1   **Choose the correct or the best alternative in the following:**   **(2×10)**

   a. Which of the following is a component of an expert system?
     (A) Inference engine   **(B)** Knowledge base
     (C) User interface   **(D)** All of these

   b. A* algorithm is based on
     (A) Breadth-First-Search   **(B)** Depth-First –Search
     (C) Best-First-Search   **(D)** Hill climbing

   c. Best-First search can be implemented using the following data structure.
     (A) Queue   **(B)** Stack
     (C) Priority Queue   **(D)** Circular Queue

   d. Translate the following statement into FOL.
     "For every a, if a is a philosopher, then a is a scholar"
     (A) ∀ a philosopher(a) scholar(a)
     (B) ∃ a philosopher(a) scholar(a)
     (C) All of these
     (D) None of these

   e. How many types of quantification are available in artificial intelligence?
     (A) 1   **(B)** 2
     (C) 3   **(D)** 4

   f. Which is true for neural networks?
     (A) It has set of nodes and connections
     (B) Each node computes it's weighted input
     (C) Node could be in excited state or non-excited state
     (D) All of these

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g. General algorithm applied on game tree for making decision of win/lose is
   (A) DFS/BFS Search Algorithms
   (B) Heuristic Search Algorithms
   (C) Greedy Search Algorithms
   (D) MIN/MAX Algorithms

h. Treatment chosen by doctor for a patient for a disease is based on
   (A) Only current symptoms
   (B) Current symptoms plus some knowledge from the textbooks
   (C) Current symptoms plus some knowledge from the textbooks plus experience
   (D) All of these

i. Which are needed to compute the logical inference algorithm?
   (A) Logical equivalence   **(B)** Validity
   (C) Satisfiability   **(D)** All of these

j. Multilayer Artificial Neural Network is having _____ number of layers.
   (A) 1   **(B)** 2
   (C) At least 3 or more   **(D)** 5

Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.

Q.2   a. Define various objectives of artificial intelligence. How future is achieved by these objectives?   **(8)**

b. Write various applications of Artificial Intelligence.   **(8)**

Q.3   a. Differentiate between propositional logic and predicate logic.   **(8)**

b. Write PROLOG program for monkey banana problem and explain how it works**?**
                                                                                  (8)

Monkey Banana Problem: A monkey is in a room. Suspended from the ceiling is a bunch of bananas beyond the monkey's reach. However, in the room there are also a chair and a stick. The ceiling is just the right height so that a monkey standing on a chair could knock the bananas down with the stick. The monkey knows how to move around, carry other things around, reach for the bananas, and wave a stick in the air. What is the best sequence of actions for the monkey?

Q.4   a. Construct a semantic net for given statement "*John gave Mary the book.*"   **(4)**

b. Write various methods for knowledge acquisition. What is the role of knowledge engineer.   **(8)**

c. How inheritance handled with semantic network.   **(4)**

Q.5　a. Explain Dumpsters Shafer's theory.　　　　　　　　　　**(6)**

　　　b. Explain, how associative networks work? Represent the following in schubert's
　　　representation scheme:　　　　　　　　　　　　　　　　**(4)**
　　　　　　- Every player kicked a ball.
　　　　　　- All players like the referee.
　　　　　　- Ravi believes that there is a fish with lungs.

　　　c. What is uncertainty. How it can be formulated in AI.　　　　**(6)**

Q.6　a. What is heuristics? How it is used to solve AI problem?　　　**(4)**

　　　b. Explain A* algorithm. Which one it uses, queue or stack, and why?　**(6)**

　　　c. Explain Minimax search for tictactoe.　　　　　　　　　**(6)**

Q.7　a. Explain various components of an expert systems.　　　　　**(10)**

　　　b. What is the role of knowledge engineer in building an expert system?　**(6)**

Q.8　a. Explain various components of artificial neuron.　　　　　**(6)**

　　　b. Give benefits and limitations of Neural computing.　　　　**(4)**

　　　c. Explain error correction learning with example.　　　　　**(6)**

Q.9　a. Explain role of AI in medicine.　　　　　　　　　　　**(5)**

　　　b. How AI is being utilized in E-commerce?　　　　　　　　**(5)**

　　　c. How E-Tourism has been evolved through the use of AI?　　　**(6)**