ROLL NO. _____

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

AMIETE – CS/IT (Current & New Scheme)

Time: 3 Hours **JUNE 2016** **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. Narrow/Weak AI is
(A) the embodiment of human intellectual capabilities within a computer.
(B) a set of computer programs that produce output and these would be considered to reflect intelligence if it were generated by humans.
(C) the study of mental faculties through the use of mental models implemented on a computer.
(D) All of these

b. An AI technique that allows computers to understand associations and relationships between objects and events is called:
(A) heuristic processing **(B)** cognitive science
(C) relative symbolism **(D)** pattern matching

c. A network with labelled nodes and arcs that can be used to represent certain natural language grammars to facilitate parsing.
(A) Tree Network **(B)** Star Network
(C) Transition Network **(D)** Complete Network

d. How do you represent "All dogs have tails".
(A) ∀x: dog(x) → hastail(x) **(B)** ∀x: dog(x) → hastail(y)
(C) ∀x: dog(y) → hastail(y) **(D)** ∀x: dog(x) → hasàtail(x)

e. A Hybrid Bayesian network contains
(A) Both discrete and continuous variables
(B) Only Discrete variables
(C) Only Discontinuous variable
(D) Both Discrete and Discontinuous variable

f. In an Unsupervised learning
(A) Specific output values are given
(B) Specific output values are not given
(C) No specific Inputs are given
(D) Both inputs and outputs are given

g. The traveling salesman problem involves n cities with paths connecting the cities. The time taken for traversing through all the cities, without knowing in advance the length of a minimum tour, is
(A) O(n) **(B)** O(n2)
(C) O(n!) **(D)** O(n/2)

h. Among the following which is not a horn clause?
(A) p **(B)** Øp V q
(C) p → q **(D)** p → Øq

i. What is state space?
(A) The whole problem
(B) Your Definition to a problem
(C) Problem you design
(D) Representing your problem with variable and parameter

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

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

Q.2 a. Discuss the term artificial intelligence as defined by various scientists and researchers. How it is useful in computer science? Explain. **(10)**

b. Write various applications of AI. **(6)**

Q.3 a. Discuss the role of "symbolic logic" in AI. **(4)**

b. What is First Order Logic? **(4)**

c. Explain the term Modus Pones with example. **(4)**

d. Draw a truth table for the conjunction of propositions P and Q. **(4)**

Q.4 a. Differentiate between Procedural and Declarative Knowledge. **(8)**

b. Write short notes on Forward Chaining System and Backward Chaining System. **(8)**

Q.5 a. What are Well Formed Propositions? **(8)**

b. Discuss types of reasoning in Bayesian Networks. **(8)**

Q.6 Explain Depth First Search Algorithm and Breadth First Search Algorithm with example. **(16)**

Q.7 a. Explain Knowledge Acquisition stages. **(8)**

b. Explain The Perceptron Learning rule. **(8)**

Q.8 a. Explain FeedForward Neural Networks and Feed Back Neural Networks. **(10)**

b. Differentiate between Neural Networks and Expert Systems. **(6)**

Q.9 Write short notes on the following: **(8×2)**
(i) AI in medicine (ii) AI in Industry