Code: AC74/AT74/AC123/AT123

Subject: ARTIFICIAL INTELLIGENCE & NEURAL NETWORKS

AMIETE – CS/IT (Current & New Scheme)

Time: 3 Hours   **JUNE 2017**   **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. An expert system differs from a database program in that only an expert system:
  (A) contains declarative knowledge
  (B) Contains procedural knowledge
  (C) Features the retrieval of stored information
  (D) Expects users to draw their own conclusions

b. 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

c. Which is not the commonly used programming language for AI?
  (A) PROLOG   **(B)** Java
  (C) LISP   **(D)** Perl

d. Which is the best way to go for Game playing problem?
  (A) Linear approach   **(B)** Heuristic approach
  (C) Random approach   **(D)** Optimal approach

e. A production rule consists of
  (A) A set of Rule   **(B)** A sequence of steps
  (C) Both **(A)** and **(B)**   **(D)** Arbitrary representation to problem

f. Machine learning is
  (A) The autonomous acquisition of knowledge through the use of computer programs
  (B) The autonomous acquisition of knowledge through the use of manual programs
  (C) The selective acquisition of knowledge through the use of computer programs
  (D) The selective acquisition of knowledge through the use of manual programs

g. Neural Networks are complex _____ with many parameters.
   (A) Linear Functions   **(B)** Nonlinear Functions
   (C) Discrete Functions   **(D)** Exponential Functions

h. 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

i. How is Fuzzy Logic different from conventional control methods?
   (A) IF and THEN Approach
   (B) FOR Approach
   (C) WHILE Approach
   (D) DO Approach

j. What is Transposition rule?
   (A) From $P \rightarrow Q$, infer $\sim Q \rightarrow P$
   (B) From $P \rightarrow Q$, infer $Q \rightarrow \sim P$
   (C) From $P \rightarrow Q$, infer $Q \rightarrow P$
   (D) From $P \rightarrow Q$, infer $\sim Q \rightarrow \sim P$

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

Q.2 a. With suitable example, show the difference between AI programming and Conventional programming. Explain different types of intelligent agent program. **(8)**

   b. Write short notes on: **(8)**
   (i) Robotics
   (ii) Game Playing

Q.3 a. Briefly **e**xplain the rules of inference with the help of suitable examples. **(8)**

   b. What is Clause and predicates? Consider the following set of facts: **(8)**
   (i)   Marcus was a man.
   (ii)   All men are mortal.
   (iii)   Marcus was born in 40 A. D.
   (iv)   Marcus was a Pompeian.
   (v)   All Pompeians died when the volcano erupted in 79 A. D.
   (vi)   No mortal lives longer than 150 years.
   (vii)   It is now 1991.
   (viii) Alive means not dead.
   (ix)   If someone dies, then he is dead at all later times.
   Solve the Resolution "Is Marcus alive ?"

Q.4 Write short note on the following: **(4×4)**
   (i)   Frame
   (ii) Dempster shafer theory
   (iii) Inductive Learning
   (iv) Fuzzy Logic

Q.5 a. Explain declarative and procedural knowledge with suitable example. **(8)**

   b. Explain how Bayesian Probabilistic Inference and Dumpster-Shafer theory is used in uncertainty. **(8)**

Q.6 a. State the algorithm for Best First Search? Differentiate with AO* search. **(8)**

   b. Solve the following crypt-arithmetic problem and also state the solution strategy. **(8)**
```
 FORTY
  +TEN
  +TEN
 SIXTY
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Q.7 a. Draw the schematic diagram of an expert system. Explain all the relevant components. **(8)**

   b. Write the difference between supervised and unsupervised learning with suitable example. **(8)**

Q.8 a. Explain Error Back-propagation Training algorithm. **(8)**

   b. Explain Multi-layer perceptron in details. **(8)**

Q.9 Explain how AI works in tourism and trip planning with suitable example. **(16)**