Code: AC74/AT74   Subject: ARTIFICIAL INTELL. & NEURAL NETWORKS

AMIETE – CS/IT

Time: 3 Hours **DECEMBER 2013** 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. In a rule-based system, procedural domain knowledge is in the form of:

(A) production rules **(B)** rule interpreters
(C) meta-rules **(D)** control rules

b. The field that investigates the mechanics of human intelligence is:

(A) history **(B)** cognitive science
(C) psychology **(D)** sociology

c. What is the name of the computer program that contains the distilled knowledge of an expert?

(A) DBMS **(B)** Expert System
(C) Artificial intelligence **(D)** Data base management system

d. Which of the following is a component of an expert system?

(A) Inference engine **(B)** Knowledge base
(C) User interface **(D)** All of these

e. Which of the following verbs can be represented as MTRANS using Schank's CD representation?

(A) walk **(B)** tell
(C) give **(D)** run

f. Mini-max procedure is a _____ search.

   (A) Depth first search
   (B) Breadth first search
   (C) Depth First Depth Limited Search
   (D) D-search

g. A well formed formula expressed as disjunction of literals is called

   (A) Relation   (B) Clause
   (C) Negation   (D) None of these

h. Intelligent agents should have capacity for _____

   (A) Perceiving   (B) Knowledge Representation
   (C) Reasoning   (D) All of these

i. The process of making two or more expressions same is called _____

   (A) resolution   (B) deduction
   (C) unification   (D) conversion

j. If a heuristic value _____ then A* guarantees an optimal solution.

   (A) Overestimates   (B) Never overestimates
   (C) Underestimates   (D) Never Underestimates

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

Q.2 a. What is the basic idea behind turing test? Explain how it is done. What is the interpretation?   **(6)**

   b. Write six tasks where AI systems have been able to achieve success or limited success. What can AI systems not do yet? List any four.   **(10)**

Q.3   Consider the following sentences:
   (i)   John likes all kinds of food.
   (ii)   Apple is food.
   (iii) Chicken is food.
   (iv)   Anything anyone eats and is not killed by is food.
   (v)   Bill eats peanuts and is still alive.
   (vi)   Sue eats everything Bill eats.

   a. Translate these sentences into formulas in predicate logic.   **(4)**
   b. Covert the formula of (a) into clausal form.   **(4)**
   c. Prove that 'John likes peanuts' using resolution.   **(8)**

Q.4 a. Briefly describe the procedure used for knowledge Acquisition.

   b. What is the object of a Knowledge Representation? What are the four categories of knowledge representation? Explain. **(8)**

Q.5 a. Calculate C.F. (H) under forward chaining using C.F.(F)=0.7 & C.F.(L)=0.5 as initial facts and the following knowledge base:

   IF K & L THEN J   (0.8)
   IF F & J THEN M   (0.9)
   IF F THEN I   (0.6)
   IF NOT L & I THEN N   (0.8)
   IF N THEN G   (0.8)
   IF M THEN G   (0.8)
   IF G THEN H   (0.9)   **(8)**

   b. Represent the following sentence by semantic net:
       "Mary gave the green flowered vase to her favourite cousin." **(4)**

   c. Differentiate between Non-monotonic and Monotonic reasoning. **(4)**

Q.6 a. Explain Hill Climbing search technique. How is it different from A* search technique? **(10)**

   b. In which situations is it preferable to use Breath First Search strategy rather than the Depth First Search Strategy? **(6)**

Q.7 a. How do expert systems differ from conventional programs? **(5)**

   b. Explain inference mechanism in rule-based Expert System with the help of an example. **(5)**

   c. Discuss the following learning situations of Artificial Neural Networks:
       Supervised and Unsupervised Learning. **(6)**

Q.8 a. Discuss advantages and disadvantages of Neural networks. **(6)**

   b. Explain perceptron training algorithm. Give an example also. **(10)**

Q.9 Write notes on the following with respect to use of Artificial Intelligence in:

   (i) Online Negotiation
   (ii) Online Auctions
   (iii) Diagnosing and Treating Problems
   (iv) In Industry **(4×4)**