ROLL NO. _____

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

AMIETE – CS/IT

Time: 3 Hours **DECEMBER 2014** **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 one would be the equivalent relation to $\sim A \vee (B \wedge C)$?

(A) $(A \vee B) \vee (A \vee C)$ **(B)** $(A \wedge B) \vee (A \wedge C)$
(C) $(B \wedge C) \vee \sim A$ **(D)** $(A \wedge B) \wedge (A \vee C)$

b. A pictorial representation of objects, their attributes and the relationship that exists between them is

(A) Frame **(B)** Semantic Net
(C) Predicate Logic **(D)** CD Formalism

c. Which of the following is actually constructed during the heuristic search?

(A) Binary search **(B)** Search Form
(C) Search Tree **(D)** None of these

d. Let Love(y, x) represent y loves x in predicate calculus. If ∀(.) represents a universal a quantifier and ∃(.) represents an existential quantifier, which one of the following will be a correct representation for *Everyone is loved by someone*.

(A) ∀(y) ∃(x) Love (y,x) **(B)** ∀(x) ∃(y) Love (y,x)
(C) ∀(y) ∃(x) (x -> Love (y,x)) **(D)** ∀(y) ∀ (x) Love (y,x)

e. Which search technique takes less memory?

(A) Depth first search **(B)** Breadth first search
(C) Optimal search **(D)** Linear search

f. How do you represent "All Dogs have tails"?

(A) $\forall x : dog(x) \rightarrow hastail(x)$ **(B)** $\forall x : dog(x) \vee hastail(y)$
(C) $\forall x : dog(y) \sim hastail(x)$ **(D)** $\forall x : dog(y) \Leftrightarrow hastail(y)$

g. Which of the following is an expert system?

(A) DENDAL **(B)** MYCIN
(C) FRAME **(D)** AMYCIN

h. A 'literal' is

(A) an atom **(B)** negation of an atom
(C) both **(A)** and **(B)** **(D)** none of these

i. Which is the single processing operator with 2 inputs?

(A) AND **(B)** OR
(C) XOR **(D)** both **(A)** and **(B)**

j. Which of the following is a heuristics based searching technique?

(A) Breath-first search **(B)** Depth-first search
(C) Iterative deepening search **(D)** Hill-climbing

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

Q.2 a. List and discuss two potentially negative effects on society of the development of Artificial Intelligence Technique. **(6)**

b. Write down four applications of Artificial Intelligence. **(4)**

c. The philosopher, Searle uses the experiment of Chinese room to demonstrate that the machine does not understand. Explain the experiment and Chinese room. **(6)**

Q.3 a. Convert the following sentences into classical form:

(i) Whoever can read is literate.
(ii) Dolphins are not literate.
(iii) Some Dolphins are intelligent.
Prove that: Some who are intelligent cannot read. **(8)**

b. What is resolution? Explain SLD resolution technique used in PROLOG. Use suitable example. **(8)**

Q.4 a. Write down stages of knowledge acquisition. **(8)**

b. Explain principles of semantic networks. Make semantic network of following statements:

Tom is a ginger coloured cat owned by John. Tom caught a bird. **(8)**

Q.5 a. Explain Hybrid representation systems. **(8)**

b. Explain Dempster and Shafer's theory of evidences in detail. **(8)**

Q.6 a. Explain heuristics Search techniques. How are these techniques different from blind search techniques? **(8)**

b. Explain briefly Breadth first search and depth first search techniques. Write algorithm also. **(8)**

Q.7 a. Write down the comparisons between conventional computers and neural networks. **(8)**

b. Explain working of inference engine in an expert system using suitable examples. **(8)**

Q.8 a. Differentiate between neural networks and expert system. **(8)**

b. What are the advantages and disadvantages of Neural network computing? **(8)**

Q.9 a. Explain how AI can be used in solving Real-World problems and in enhancing scalability. **(8)**

b. What do you mean by multi-agent systems (MAS)? Why are these successful? **(8)**