

## AMIETE – CS/IT

Time: 3 Hours

**JUNE 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 of the following systems helps you with making a decision about a non-structured problem?

- (A) Artificial intelligence (B) Neural network  
(C) Genetic algorithm (D) Decision support system

b. Which AI system provides a diagnosis to a specific problem?

- (A) Intelligent agent (B) Expert system  
(C) Geographical information system (D) Data mining system

c. If you were making a decision involving "fuzzy logic", what type of decision would you be making?

- (A) Nonstructured (B) Ad hoc  
(C) Controlled (D) Muddled

d. What type of technology allows you to use your finger, eye, or voice print to secure your information resources?

- (A) Haptics (B) Caves  
(C) Biometrics (D) RFID

e. Which type of intelligent agent works with neural networks to classify patterns in information stored in warehouses and categorizes items into those classes?

- (A) Predictive agents (B) Data-mining agent  
(C) Neural agent (D) Digging agent

f. What is the term used for describing the judgmental or commonsense part of problem solving?

- (A) Heuristic (B) Critical  
(C) Value Based (D) Analytical

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

- g. Which of the following search technique takes less memory?
- (A) Depth first search (B) Breadth first search  
(C) Optimal search (D) Linear search
- h. How do you represent “All Dogs have tails” in FOPL?
- (A)  $\forall x : \text{dog}(x) \rightarrow \text{hastail}(x)$  (B)  $\forall x : \text{dog}(x) \vee \text{hastail}(y)$   
(C)  $\forall x : \text{dog}(y) + \text{hastail}(x)$  (D)  $\forall x : \text{dog}(x) \exists \text{hastail}(y)$
- i. In an ANN system, the output activity is proportional to the total weighted output for \_\_\_\_\_
- (A) threshold units (B) linear units  
(C) sigmoid units (D) none of these
- j. A computer vision technique that relies on image template is
- (A) Edge detection (B) Binocular vision  
(C) Model-based vision (D) Robot vision

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

- Q.2** a. What are main objectives of AI research? (8)
- b. Differentiate between symbolic and non-symbolic representation. (8)
- Q.3** a. For each pair of atomic sentences given below, give the most general unifier if it exists.
- (i)  $P(A,B,B), P(x,y,z)$   
(ii)  $Q(Y,G(A,B)), Q(G(x,x),y)$   
(iii)  $\text{Older}(\text{Father}(y),y), \text{Older}(\text{father}(x), \text{John})$   
(iv)  $\text{Knows}(\text{father}(y),y), \text{Knows}(x, x)$  (4)
- b. For the following axioms :
1.  $\text{man}(\text{Marcus})$
  2.  $\text{pompeian}(\text{Marcus})$
  3.  $\text{horn}(\text{Marcus},40)$
  4.  $\neg \text{man}(x_1) \vee \text{mortal}(x_1)$
  5.  $\neg \text{pompeian}(x_2) \vee \text{died}(x_2,79)$
  6.  $\text{erupted}(\text{volcano},79)$
  7.  $\neg \text{morta}(x_3) \vee \neg \text{born}(x_3,t_1) \vee \neg \text{gt}(t_2-t_1,150) \vee \text{dead}(x_3,t_2)$
  8.  $\text{now}=2028$
  9.  $\neg \text{alive}(x_4,t_3) \vee \neg \text{dead}(x_4,t_3)$
  10.  $\text{dead}(x_5,t_4) \vee \text{alive}(x_5,t_4)$
  11.  $\neg \text{dead}(x_6,t_5) \vee \neg \text{gt}(x_6,t_5) \vee \text{dead}(x_6,t_6)$
- Prove  $\neg \text{alive}(\text{Marcus},\text{now})$ . (8)

- c. When is a WFF said to be :-  
(i) Valid (ii) Satisfiable (4)
- Q.4** a. Write four properties that a good system must possess for the representation of knowledge. Also write issues in knowledge representation. (8)  
b. Explain procedure for knowledge acquisition. (8)
- Q.5** a. What is Hybrid Representation system? Explain any one such representation system. (8)  
b. Explain Dempster and Shafer's theory of evidences in detail. (8)
- Q.6** a. Describe Depth First Search algorithm and illustrate it with an example. Write its drawback also. (8)  
b. Explain heuristic search techniques briefly. Describe how it is applied in branch-and-bound search procedure. (8)
- Q.7** a. Illustrate expert system with the help of a neat diagram and explain all components. (8)  
b. What are the features of biological neural network that make it superior to even the most sophisticated AI computer system? (8)
- Q.8** a. What are the advantages and disadvantages of neural networks? (8)  
b. Write comparison between neural networks and expert system. (8)
- Q.9** a. Explain role of AI in e-tourism. (8)  
b. There are different types of clinical task to which expert system can be applied. Explain any such four tasks. (8)