

AMIETE – CS/IT (Current Scheme)

Time: 3 Hours

JUNE 2015

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 AI system finds and identifies patterns; for instance; in the words you use?

- (A) Expert system
(C) Neural network

- (B) Intelligent system
(D) Fuzzy logic

b. Which of the following is not a hybrid representation systems?

- (A) COLAB
(C) CLASSIC

- (B) YAK
(D) GENERAL

c. Which of the following is not true about scripts?

- (A) Scripts have ability to predict event
(B) In scripts, a single coherent interpretation may be build up from a collection of observations
(C) Scripts are more general than frames
(D) None of these

d. What is called as exploration problem?

- (A) State and action are unknown to the agent
(B) State and actions are known to the agent
(C) Only actions are known to the agent
(D) Both (B) & (C)

- e. What are you predicating by the logic: $\forall x : \exists y: \text{loyalto}(x, y)$.
 (A) Everyone is loyal to someone (B) Everyone is loyal to all
 (C) Everyone is not loyal to someone (D) Everyone is loyal
- f. The Travelling Salesman Problem can be solved using:
 (A) Hill Climbing (B) Means ends analysis
 (C) Constraint Satisfaction (D) None of these
- g. In A* algorithm the algorithm is said to be admissible-
 (A) If it is guaranteed to return an optimal solution
 (B) If it always terminate with a solution
 (C) If a good heuristic function is used
 (D) None of these
- h. Which AI system will continue to analyze a problem until it finds the best solution?
 (A) Genetic algorithm (B) Neural network
 (C) Intelligent agent (D) Expert system
- i. Which is not Familiar Connectives in First Order Logic?
 (A) and (B) iff
 (C) or (D) not
- j. Which is true for Decision theory?
 (A) Decision Theory = Probability theory + utility theory
 (B) Decision Theory = Inference theory + utility theory
 (C) Decision Theory = Uncertainty + utility theory
 (D) Decision Theory = Probability theory + preference

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

- Q.2** a. The future directions of research & development in AI can be in “Information creation” and “Autonomy”. Explain in detail. (8)
 b. What do you mean by intelligence? What essential abilities one should possess for intelligence? (8)
- Q.3** a. Attempt to unify the following pairs of expression. Either show their most general unifiers or explain why they will not unify. (9)
 (i) $p(X, Y)$ and $p(a, Z)$
 (ii) $p(X, X)$ and $p(a, b)$
 (iii) $\text{ancestor}(X, Y)$ and $\text{ancestor}(\text{bill}, \text{father}(\text{bill}))$
 (iv) $\text{ancestor}(X, \text{father}(X))$ and $\text{ancestor}(\text{david}, \text{George})$
 (v) $q(X)$ and $\neg q(a)$
 (vi) $p(X, a, Y)$ and $p(Z, Z, b)$
- b. Show that $S \vee R$ is tautologically implied by $(P \vee Q) \wedge (P \rightarrow R) \wedge (Q \rightarrow S)$ (7)

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

- Q.4** a. Briefly describe the different techniques for knowledge representation. (8)
b. Write a script for “robbing a bank”. (8)
- Q.5** a. Explain Dempster and Shafer’s theory of evidences. (8)
b. Write notes on following:
(i) Default Logic (ii) Fuzzy Logic (4×2)
- Q.6** a. Would you use breadth-first or depth-first search for each of the following problems? What would you base your choice on? (8)
(i) A chess playing program.
(ii) A medical diagnostic program.
(iii) A program to determine the best sequence of manufacturing steps to go from raw materials to a finished product.
(iv) A program that attempts to determine if two expressions in the propositional calculus are equivalent.
b. Describe Hill climbing search technique and also explain when it will fail. (8)
- Q.7** a. Differentiate between:
(i) Data processing and knowledge processing
(ii) Database and knowledge base (8)
b. What features of biological neural network make it superior to most sophisticated AI computer system? (8)
- Q.8** a. What is Hopfield model of a neural network? Explain. (6)
b. What is self-organization network? (6)
c. Discuss the limitations of Neural Networks. (4)
- Q.9** a. Discuss the use of Artificial intelligence techniques in E-Commerce applications. (8)
b. Write a short note on: (4×2)
(i) Computer vision
(ii) Machine perception