Printed Pages : 4

NMCA413

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 214427

Roll No.

MCA
(SEM. IV) THEORY EXAM. 2014-15
ARTIFICIAL INTELLIGENCE

Time : 3 Hours] [Total Marks : 100

Note : Attempt the questions as indicated.

Q1. Attempt any *four* questions from the following : 5x4=20

a) Define the terms - natural intelligence and artificial intelligence. How do you differentiate between the two?

b) Write four properties a good system should possess for the knowledge representation in a particular domain.

c) What is natural language processing?

d) State and explain the Branch-and-bound searching technique.

e) Define and differentiate between weak and strong AI.

f) Write down the foundation of AI.

Q2. Attempt any ***four*** questions from the following : 5x4=20

a) What is the difference between knowledge representation and knowledge acquisition?

b) What do you mean by constraint satisfaction problem? Explain constraint satisfaction algorithm.

c) Explain the effect of over-estimation and under-estimation on A* algorithm.

d) Explain AND-OR graph.

e) Differentiate between simple hill climbing and steepest-ascent hill climbing algorithms.

f) Discuss MIN-MAX algorithm for game playing.

Q3. Attempt any ***two*** questions from the following : 10x2=20

a) Convert the following sentences to FOPL-

- Jack owns a dog
- Every dog owner is an animal lover.
- No animal lover kills an animal.
- Either Jack or Curiosity killed the cat, who is named Tuna.

Also prove by resolution – **Did curiosity kill the cat**

b) Using propositional linear resolution, show the following propositional sentence is unsatisfiable. Convert this sentence to clause form and derive the empty clause using resolution –

$$(P \vee Q \vee \neg R) \vee ((\neg R \vee Q \vee P) \Rightarrow (R \vee Q) \wedge \neg Q \wedge \neg P)$$

c) What is Bayesian reasoning? What does a Bayesian network represent? Explain.

Q4. Attempt any ***two*** questions from the following : 10x2=20

a) What is machine learning? Differentiate between supervised, unsupervised and reinforcement learning.

b) Explain how classification is done by using Bayes classifier.

c) Explain the expectation and maximization (EM) algorithm for finding the maximum likelihood with hidden variables.

Q5. Attempt any ***two*** questions from the following : 10x2=20

a) With the help of a suitable diagram, explain the classification process in a pattern recognition system.

b) To which category of clustering schemes does the k-means algorithm belong? What is its major advantage? Which are the factors that influence the computation duration of this algorithm?

c) Write short notes on the following :

i) Computer vision

ii) Control strategy

iii) Alpha-beta pruning
