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

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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.