53 (CS 711) ARIN

2014

ARTIFICIAL INTELLIGENCE

Paper : CS 711

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1. *(a)* Answer the questions in brief : 2×5=10

   (i) What is the objective of AI ?

   (ii) What is the importance of an expert system ?

   (iii) What is the importance of inferencing ?

   (iv) What is Turing test ?

   (v) What is the importance of neural network ?

(b) Differentiate between the following : 2×5=10

(i) Propositional Logic (PL) and First Order Predicate Logic (FOPL)

(ii) Resolution and refutation

(iii) Deductive and non-deductive inference

(iv) Breadth first search and depth first search

(v) Conjunctive normal form and disjunctive normal form.

2. (a) Explain the application of artificial intelligence in various fields. 8

(b) What is a clause ? Define Horn clause. Convert the following expression into clausal form :

$$\exists x \forall y (\forall z P(f(x), y, z) \rightarrow (\exists u Q(x, u) \wedge \exists v R(y, v)))$$

2+1+5=8

(c) Convert $(P \rightarrow Q) \leftrightarrow R$ into CNF. 4

3. *(a)* What is the advantage of a heuristic function ? Explain with a suitable example. 2+8=10

(b) What do you mean by hill climbing ? What problems may arise during hill climbing ? Explain each of the problems and their solutions. 2+2+6=10

4. *(a)* What is alpha-beta pruning ? Show the benefits of alpha-beta pruning with a suitable example. 3+7=10

(b) Define optimal search. Show the application of optimal search algorithm to an appropriate problem. 2+8=10

5. *(a)* What are different methods of learning ? Explain the general learning model with a diagram. 2+8=10

(b) Define the terms dendrite, synaptic. How does a neural network work ? Explain the function of supervised and non-supervised learning in neural network. 2+4+4=10

6. *(a)* What is learning automata ? Explain learning automaton model with a suitable example. 2+8=10

(b) How can skolemization be established ? Define the terms interpretation, tautology, contradiction with examples. 4+6=10

7. Write short notes on the following : ***(any four)*** 5×4=20

(a) Unification

(b) Inductive learning

(c) Best first search

(d) Abductive inference

(e) Iterative deepening search

(f) State space search.
