Code :R7320505 1

III B.Tech II Semester(R07) Regular & Supplementary Examinations, April/May 2011
ARTIFICIAL INTELLIGENCE & NEURAL NETWORKS
(Computer Science & Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE questions
All questions carry equal marks

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1. (a) Discuss the cognitive modeling approach.
   (b) Explain a general model of learning agents.
2. Discuss the breadth first search and depth first search strategies. List the merits and demerits of each with examples.
3. (a) Compare the processing capabilities of a computer with biological neural network.
   (b) Give the basic structures of artificial neural networks.
4. (a) Distinguish between multilayer perceptron and a general multilayer feed forward neural network.
   (b) Explain perceptron convergence theorem.
5. (a) Describe the Boltzmann machine.
   (b) Explain the objective of pattern storage network.
6. (a) Discuss about the self organization network.
   (b) Describe the architecture of Radial Basic Function networks.
7. Is the knowledge of logical agents definite? Justify your answer with suitable illustrations.
8. (a) Explain the models for first order logic.
   (b) Describe the inference rules for quantifiers.

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1. (a) Explain the semantics of propositional logic with suitable examples.
   (b) Obtain the conjunctive normal forms of
      i. $P \wedge (P \rightarrow Q)$
      ii. $\neg (P \vee Q) \Leftrightarrow P \wedge Q$
2. (a) Explain with an example, construction of proof tree by backward chaining.
   (b) Describe the structure of a completeness proof for resolution.
3. (a) Define intelligence, artificial intelligence, agents.
   (b) Discuss the structure of agents in detail.
4. What is meant by search strategy? Discuss any two search strategies that come under the heading of uniformed search.
5. Briefly explain the three classical models for an artificial neuron.
6. (a) Discuss the issues in back propagation learning.
   (b) Explain perception representation problem.
7. (a) Describe the Markov property of the simulated annealing process.
   (b) How does Boltzmann machine perform pattern completion and pattern association? Explain.
8. (a) Explain the feature mapping of 2-D input onto 1-D feature space.
   (b) Discuss the theorems for function approximation.

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Code :R7320505 **3**

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1. Construct a knowledge base for the wumpus world using the semantics of propositional logic and explain.
2. (a) Discuss in detail the resolution strategies.
   (b) Write a note on lifting lemma.
3. (a) Explain model - based agents.
   (b) Describe the turing test approach.
4. (a) How to measure problem - solving performance?
   (b) Discuss uniform - cost search. Give time and space complexity.
5. (a) Explain McCulloch - pitts model for an artificial neuron.
   (b) Describe pattern association problem.
6. (a) Discuss the issues in perception learning.
   (b) Why convergence is not guaranteed for back propagation learning algorithm? Explain.
7. (a) What is a stochastic network? Discuss the operation on stochastic network.
   (b) Explain Boltzmann machine learning algorithm for binary units.
8. (a) What are the salient features of the Kohonen's self - organizing learning algorithm.
   (b) What is an associative memory? Discuss the requirements of an associative memory.

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1. (a) Explain truth table enumeration algorithm for deciding propositional entailment.
   (b) Give a detail note on conjunctive normal form.
2. (a) Explain the uniform algorithm with an illustration.
   (b) Discuss the technique of propositionalization.
3. (a) Describe utility based agents.
   (b) Explain how an agent interacts with an environment with examples.
4. (a) Discuss Greedy best - first search strategy.
   (b) Explain min max algorithm used in game playing.
5. What are the basic learning laws? Explain each one of them in detail.
6. (a) Distinguish between linearly separable and linearly inseparable problems.
   (b) Discuss the applications and limitations of back propagation learning.
7. (a) Draw a state transition diagram for a 3 - unit model with bipolar {-1, +1} units.
   (b) Discuss the issues in Boltzmann learning.
8. (a) What is adaptive vector quantization and learning vector quantization?
   (b) Explain the principle of recognition for pattern variability task.
   (c) What is an avalanche architecture?

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