Code.No: 07A60504 | R07 | SET-1

III B.TECH – II SEM EXAMINATIONS, DECEMBER - 2010
ARTIFICIAL INTELLIGENCE AND NEURAL NETWORKS
(COMPUTER SCIENCE AND ENGINEERING)

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

Answer any FIVE questions
All questions carry equal marks
- - -

1.a) What is AI?
b) Explain how mathematics has contributed as a foundation of AI. [8+8]

2.a) Explain the breadth first search.
b) Explain the minimax procedure with an example. [8+8]

3. What is a knowledge-based agent? Explain it in detail, using "Wumpus World" as an example. [16]

4.a) Explain unification in first order logic.
b) Explain resolution in first order logic. [8+8]

5.a) Explain the Hebb's law, delta learning law and instar learning law.
b) Explain the functional units of ANN. [8+8]

6.a) What is a linear associative network? Explain any one method used by it to determine weights by learning for pattern association.
b) What is linear separability in pattern classification? Explain with an example. [8+8]

7.a) What is meant by 'basins of attraction'?
b) Explain the energy analysis of the Hopfield network. [6+10]

8. Explain the analysis of feature mapping networks. [16]

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ARTIFICIAL INTELLIGENCE AND NEURAL NETWORKS
(COMPUTER SCIENCE AND ENGINEERING)

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

Answer any FIVE questions
All questions carry equal marks
- - -

1.a) What is a rational agent?
b) Explain the percept sequence for the vacuum cleaner world. [8+8]

2. Describe the Alpha-Beta pruning with an example. [16]

3.a) Explain forward chaining in propositional logic.
b) Consider the following axioms:

P
$(P \wedge Q) \rightarrow R$
$(S \vee T) \rightarrow Q$
T

Prove R using resolution in propositional logic. [8+8]

4.a) Compare inference in propositional logic with inference in first order logic.
b) Explain Unification in first order logic. [8+8]

5.a) Explain the McCulloch-Pitts model of neuron.
b) Explain the Perceptron model of neuron. [8+8]

6.a) What is generalized delta rule?
b) Explain in detail the backpropagation algorithm . [4+12]

7.a) What is a pattern storage network?
b) Explain the Hopfield model. [8+8]

8. Discuss in detail about pattern clustering networks. [16]

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Code.No: 07A60504 | R07 | SET-3

III B.TECH – II SEM EXAMINATIONS, DECEMBER - 2010
ARTIFICIAL INTELLIGENCE AND NEURAL NETWORKS
(COMPUTER SCIENCE AND ENGINEERING)

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

Answer any FIVE questions
All questions carry equal marks
- - -

1.a) What is PEAS description? Describe the same with an example.
b) Explain the function of the goal-based agent. [8+8]

2.a) Distinguish between informed and uninformed search strategies.
b) Explain the greedy best first search with an example. [4+12]

3. Explain the following in propositional logic:
a) Validity and satisfiability.
b) Resolution.
c) Forward chaining. [4+6+6]

4.a) Explain backward chaining in first order logic.
b) What is resolution in first order logic? [8+8]

5. Explain the differences:
a) Biological vs Artificial neuron
b) Delta learning law vs LMS learning law
c) Supervised vs unsupervised learning in ANN. [6+6+4]

6.a) Explain perceptron learning for pattern classification.
b) State the perceptron convergence theorem, and explain its significance.
c) What are the limitations of single layer perceptron? [6+6+4]

7.a) Describe the Hopfield model and the Hopfield network algorithm.
b) Explain the use of state transition diagrams in the energy analysis of Hopfield network. [12+4]

8. Explain the associative memory networks in detail. [16]

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Code.No: 07A60504 | R07 | SET-4

III B.TECH – II SEM EXAMINATIONS, DECEMBER - 2010
ARTIFICIAL INTELLIGENCE AND NEURAL NETWORKS
(COMPUTER SCIENCE AND ENGINEERING)

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

Answer any FIVE questions
All questions carry equal marks
- - -

1. What are the four basic kinds of agent programs that embody the principles underlying almost all intelligent systems? Explain any two of them in detail. [16]

2.a) What is an informed search strategy?
b) Explain the A* search with an example. [4+12]

3. Explain the following:
a) Knowledge based agents
b) Inference rules in propositional logic
c) Conjunctive normal form in propositional logic. [5+5+6]

4. What is forward chaining in first order logic? Explain in detail with an example. [16]

5.a) Explain the structure of the biological neural network.
b) Compare the performance of the computer and biological neural networks. [12+4]

6.a) Explain the perceptron learning rule.
b) State and prove the perceptron convergence theorem. [4+12]

7.a) Explain the characteristics of pattern storage networks and the significance of the energy landscape.
b) Explain the energy analysis of the Hopfield network for the discrete Hopfield model. [8+8]

8. Explain the following:
a) Self-organizing feature map learning
b) BAM. [8+8]

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