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14SCS41

**Fourth Semester M.Tech. Degree Examination, June/July 2018**  
**Machine Learning Techniques**

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions.**

- 1
  - a. What is Machine Learning? Write the issues in machine learning. (04 Marks)
  - b. List four components in machine learning and illustrate the design of checkers learning problem with a neat sketch. (06 Marks)
  - c. Write candidate – Elimination learning algorithm and explain with an example. What are its limitations? (10 Marks)
  
- 2
  - a. What is Decision tree? Write the characteristics which are best suited for a problem of decision tree learning? (04 Marks)
  - b. Explain Gradient Descent Algorithm for training a linear unit. (06 Marks)
  - c. Calculate the information gain for all the attributes using Decision tree algorithm for the below problem. (10 Marks)

Day	Outlook	Temperature	Humidity	Wind	Play Tennis
D <sub>1</sub>	Sunny	Hot	High	Weak	No
D <sub>2</sub>	Sunny	Hot	High	Strong	No
D <sub>3</sub>	Overcast	Hot	High	Weak	Yes
D <sub>4</sub>	Rain	Mild	High	Weak	Yes
D <sub>5</sub>	Rain	Cool	Normal	Weak	Yes
D <sub>6</sub>	Rain	Cool	Normal	Strong	No
D <sub>7</sub>	Overcast	Cool	Normal	Strong	Yes
D <sub>8</sub>	Sunny	Mild	High	Weak	No
D <sub>9</sub>	Sunny	Cool	Normal	Weak	Yes
D <sub>10</sub>	Rain	Mild	Normal	Weak	Yes
D <sub>11</sub>	Sunny	Mild	Normal	Strong	Yes
D <sub>12</sub>	Overcast	Mild	High	Strong	Yes
D <sub>13</sub>	Overcast	Hot	Normal	Weak	Yes
D <sub>14</sub>	Rain	Mild	High	Strong	No

- 3
  - a. Define perceptron and explain the representation of perceptron. (04 Marks)
  - b. Explain the back propagation Algorithm with extensions. (08 Marks)
  - c. Represent the program discovered by the genetic programming as a tree. Illustrate the operation of genetic programming cross over operation by applying it using two copies of your tree as the two parents. (08 Marks)
  
- 4
  - a. Give the rules for i) The optimal Bayesian hypothesis ii) The maximum likelihood hypothesis. When are these the same. (04 Marks)
  - b. Discuss a prototypical Genetic Algorithm in detail. (06 Marks)
  - c. Describe the Naïve Bayesian method of classification. What assumption does this method make about the attributes and the classification? Give an example where this assumption is not justified. (10 Marks)

- 5 a. Explain mistake Bound model of learning for Halving Algorithm. (04 Marks)  
b. Define EM Algorithm and derive K-means Algorithm. (10 Marks)  
c. Explain shattering a set of instances and the vapnik-chervoncnkis Dimension. (06 Marks)
- 6 a. Describe K-NEAREST NEIGHBOR learning algorithm for discrete valued function. Write one major issue of this algorithm and the approaches to overcome this issue. (08 Marks)  
b. Explain Radial Basis Functions and write the approaches for choosing an appropriate number of hidden units. (04 Marks)  
c. What is the need for LEARN – ONE – RULE and explain LEARN – ONE – RULE Algorithm. (08 Marks)
- 7 a. Define the following terms :  
i) Literal  
ii) Clause  
iii) Horn clause  
iv) Substitution. (04 Marks)  
b. Explain propositional Resolution operator and propositional Inverse Resolution operator in inverting Resolution. (06 Marks)  
c. Explain the algorithm for regressing a set of literal through a single Horn clause with an example. (10 Marks)
- 8 a. Differentiate between FOIL and FOCL. (04 Marks)  
b. Illustrate Q-learning Algorithm with an example. (08 Marks)  
c. State and prove the convergence of Q learning for deterministic Markov decision process. (08 Marks)

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14SCS424

**Fourth Semester M.Tech. Degree Examination, June/July 2018**  
**Wireless Networks and Mobile Computing**

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions.**

- 1 a. What are the major categories of middleware in mobile computing? Explain. (10 Marks)  
b. Draw the GSM architecture and explain its entities. (10 Marks)
- 2 a. Explain the SMMT and SMMO with respect to the SMS architecture. (10 Marks)  
b. Explain the GPRS protocol stack with the interfaces. (10 Marks)
- 3 a. What is mobile IP? Explain the different phases and the working of mobile IP with a neat sketch. (10 Marks)  
b. What are the design constraints in applications for hand held devices. (10 Marks)
- 4 a. Explain the forward and reverse channel structure for IS-95. (10 Marks)  
b. What are the components of the smart client architecture? Explain. (10 Marks)
- 5 a. What are the challenges in the deployment phase of the smart client architecture? How are they handled? (10 Marks)  
b. Draw the smart client development cycle and explain the design phase in detail. (10 Marks)
- 6 a. Describe the steps in processing a wireless request. (10 Marks)  
b. List and explain the services and benefits of the WAP. (10 Marks)
- 7 a. Explain the MIDLet life cycle. (08 Marks)  
b. What are the steps involved in provisioning or MIDP application? (06 Marks)  
c. Describe the security considerations in MIDP. (06 Marks)
- 8 Write short notes on the following :  
a. WiMAX  
b. Cellular IP  
c. Palm OS  
d. XHTML (20 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.