

Indian Institute of Engineering Science and Technology, Shibpur

B. Tech. Information Technology, 6th Semester Mid Semester Re-test Examinations, May 2022

Machine Learning

IT-3205

Full Marks: 30

Answer any five questions

Time: 45 Minutes

1. a) In a learning system, what should be the guiding factors for choosing the training set? [3]
b) What should be the target function in a game of chess? [3]
2. a) Suppose there are two hypotheses, H1 has 15 constraints and H2 has 2 constraints, then given a set of training examples which one will classify more of them as positive? Explain what the probability will be of getting an example E1 as negative by H1 as compared to by H2. [3]
b) Demonstrate with an example how you can find out the maximally specific hypothesis. [3]
3. a) Explain when in a learning system, the probability distribution over the variables may be required? [3]
b) Explain the situation in which polynomial regression will be more useful than linear regression. [3]
4. a) Propose an error function as an alternative to squared loss and explain the advantages of the error function proposed by you over the squared loss. [3]
b) Why do we sometimes use log-likelihood instead of likelihood? Explain with an example. [3]
5. a) Describe two disadvantages of decision tree learning system. [3]
b) Explain in brief how support vector machine works. [3]
6. a) Explain the significance of hinge loss and where it is used. [3]
b) Describe two distance functions that may be used in k-NN. Which one is better and why? [3]
7. a) Explain the Naïve Bayes classifier. [3]
b) Explain the Bayesian belief network with an example. [3]