

No. of Printed Pages : 3

RCSE-002

**Ph. D. IN COMPUTER SCIENCE
(PHDCS)**

Term-End Examination

December, 2021

RCSE-002 : MACHINE LEARNING

Time : 3 Hours

Maximum Marks : 100

Weightage : 50%

Note : (i) Questions No. 1 is compulsory.

(ii) Answer any **three** questions from the rest.

1. (a) Write the steps briefly to design a “Learning System”. Illustrate this with the help of an example. 10
- (b) Write and explain the FIND-S algorithm for finding a maximally specific hypothesis. 10
- (c) “Decision tree learning is a method for approximating discrete-valued target

functions, in which the learned function is represented by a decision-tree.” Illustrate the decision-tree representation for “play tennis” example to classify Saturday mornings according to whether or not they are suitable for playing tennis. 10

- (d) With the help of an example, explain Naive Bayes classifier. 10

2. (a) Describe the Probably Approximately Correct (PAC) learning model. 10

- (b) What are the various methods for evaluating learned hypotheses ? Explain them briefly. 10

3. (a) Write and explain the candidate elimination learning algorithm using version spaces. 10

- (b) Describe briefly the widely used ID3 decision tree learning algorithm with an example. 10

4. (a) Briefly explain Vapnik-Chervonenkis dimension which is one of the useful measures of the complexity of a hypothesis space. 10

P. T. O.

[3]

- (b) “Mistake bound model is used to analyse the number of training examples a learner will misclassify before it exactly learns the target concept.” Explain the model with the help of an example. 10

5. Write short notes on any *four* of the following :

4×5=20

- (a) Weighted-Majority algorithm
- (b) Learning Bayesian belief networks
- (c) Paired *t*-tests
- (d) Issues in Decision-tree learning
- (e) Issues in Machine learning