No. of Printed Pages : 3 **RCSE–002**

Ph. D. (COURSE WORK)
COMPUTER SCIENCE (PHDCS)
Term-End Examination
June, 2026

RCSE-002 : MACHINE LEARNING

Time : 3 Hours *Maximum Marks : 100*

(Weightage 50%)

Note : *(i) Question No. 1 is compulsory.*

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

1. (a) What is Machine Learning ? Explain the challenges and limitations of Machine Learning. 10

   (b) What is Hypothesis Testing ? Explain the role of Hypothesis Testing in research. What is Null Hypothesis ? Explain with an example. Also differentiate between sample error and true error. 10

(c) Define General-to-Specific ordering of Hypothesis. Also, Explain *Find-s* algorithm with the help of an example. 10

(d) Explain Naive Bayes classification algorithm with the help of an example. 10

2. (a) What is Central-limit theorem ? Write and explain it. 10

(b) What is labeled data ? What kind of problems can be solved using labeled data by Machine Learning Techniques ? Explain. 10

3. (a) Explain the use of Vapnic-Chervonenkis (VC) dimension. Also explain the concept of shattering. 10

(b) What is z-test ? How is it different from t-test ? Explain them with the help of an example. 10

4. (a) Define the following *attributes* with the help of an example for each : 10

   (i) Binary

   (ii) Nominal

   (iii) Ordinal

   (iv) Continuous

   (b) What are basic design issues, faced in decision tree induction ? Also, explain 2-way and multiway splitting in decision tree with the help of examples. 10

5. Write short notes on the following : 4×5=20

   (a) Supervised and unsupervised learning.

   (b) Gini Index.

   (c) Pre-pruning and post-pruning of Decision Tree.

   (d) Precision, Recall and F1 Score.

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