

**Department of Computer Science and Engineering**  
**Indian Institute of Technology Jodhpur**  
**CSL 7620: Machine Learning**  
**Quiz 1**

**Total marks: 10**

**Set A- Answers**

**Time: 10 minutes**

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**Instructions:**

- During the exam, invigilators will not address any queries. If you encounter anything unclear or incorrect in a question, make a reasonable assumption and proceed
  - Each question may have multiple correct options. You have to mark all the correct options. Otherwise, no marks will be awarded.
  - Mark the correct choices with a pen on the OMR sheet. No correction is allowed in the marking.
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**Answers are marked in bold. [Each question carries 1 mark]**

1. Which of the following best defines Machine Learning as per Tom Mitchell's definition?
  - A. Programming computers to follow fixed algorithms
  - B. Giving machines the ability to learn without being explicitly programmed
  - C. A computer program improves performance on a specific task with experience**
  - D. Making machines capable of human-like reasoning
2. Which of the following are characteristics of supervised learning?
  - A. Presence of labeled data**
  - B. Learning through feedback signals
  - C. Predicting outcomes for unseen examples**
  - D. Labels are always categorical
3. Which of the following paradigms falls under unsupervised learning?
  - A. Linear Regression
  - B. Decision Trees
  - C. K-means Clustering**
  - D. None of the others
4. The VC dimension of a model
  - A. Can determine the exact test error rate for a given test dataset
  - B. Gives some indication of the ability of a model**
  - C. Does not depend on the complexity of the model
  - D. None of the others
5. Why is feature scaling used before applying ML algorithms?
  - A. It reduces the number of features
  - B. It ensures that features are at a comparable scale**
  - C. It prevents overfitting

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- D. It improves the interpretability of categorical features
6. Which of the following situations suggests high variance in a machine learning model?
- A. Similar accuracy on the training and test sets
  - B. Significantly higher training accuracy compared to test accuracy**
  - C. Consistently low accuracy on both the training and test sets
  - D. None of the others
7. Which of the following are assumptions for applying linear regression?
- A. Linearity of the input-output relationship**
  - B. Only one feature in the datasets
  - C. None of the others
  - D. Normally distributed features
8. Increasing training data
- A. Will always increase variance
  - B. Will always decrease variance
  - C. Will always have no impact on the variance
  - D. None of the others**
9. If a hypothesis space has a VC dimension of 5, which of the following statements is/are true?
- A. It can shatter every configuration of 5 points
  - B. It cannot shatter any configuration of 6 points**
  - C. It will always classify 5 points correctly
  - D. None of the others
10. If the prior probability of class  $w_1$  is 0.7 and  $w_2$  is 0.3, and the likelihoods are  $p(x|w_1)=0.2$  and  $p(x|w_2)=0.4$ , then according to the Bayes decision rule, the predicted class will be:
- A.  $w_1$**
  - B.  $w_2$
  - C. Both are equally likely
  - D. Cannot be determined without a loss function