

<b>Name:</b>	<b>Roll No:</b>	
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## Data Mining and Machine Learning

### Quiz 4, II Semester, 2024–2025

22 April, 2025

*Some questions below may have more than one correct answer. You get full credit if you select all correct options. You get partial credit if you select a non-empty, strict subset of correct options. You get zero credit if you select any incorrect option.*

1. Which of these statements are true of the perceptron algorithm?
  - (a) The algorithm always finds a separator if the data is linearly separable.
  - (b) The time taken by the algorithm to converge depends on the magnitudes of the points in the dataset.
  - (c) The perceptron algorithm is compatible with using kernels.
  - (d) The perceptron algorithm terminates with a maximum margin separator.
  
2. Which of these statements are true of support vector machines?
  - (a) When training soft-margin SVMs, if we allow a higher misclassification rate, we normally get a wider margin.
  - (b) In the dual formulation solution, the values of the Lagrange multipliers identify the support vectors.
  - (c) The dual formulation enables the use of kernel methods.
  - (d) The dual formulation can be adapted to the soft margin case.
  
3. Which of the following is/are true of the backpropagation algorithm?
  - (a) One of the inventors of the algorithm was awarded the Nobel Prize.
  - (b) The gradient for weights in the later layers is likely to be smaller than those in initial layers.
  - (c) Backpropagation is not compatible with activation functions like RELU that are not everywhere differentiable.
  - (d) Backpropagation calculations can be speeded up through parallelization.

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