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12526

3 Hours / 70 Marks

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.
(2) Answer each next main Question on a new page.
(3) Illustrate your answers with neat sketches wherever necessary.
(4) Figures to the right indicate full marks.
(5) Assume suitable data, if necessary.
(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

- 1. Attempt any FIVE of the following :** **10**
- a) Define Machine learning.
 - b) Classify Supervised machine learning.
 - c) Define unsupervised machine learning.
 - d) List the parts of Artificial Neural Network (ANN).
 - e) List any four applications of Machine learning in Robotics.
 - f) Define accuracy and Precision w.r.t evaluation metrics.
 - g) List classification algorithms. (Any four)
- 2. Attempt any THREE of the following :** **12**
- a) Describe confusion matrix with example in machine Learning.
 - b) Describe key points of support vector machine algorithm.
 - c) Explain Association rule learning and its types.
 - d) Draw and explain structure of Biological Neuron.

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- 3. Attempt any THREE of the following : 12**
- a) List cross validation techniques in ML and Describe any one in details.
 - b) Describe key points of decision tree algorithm.
 - c) Describe key points of K-means clustering in unsupervised algorithm.
 - d) Explain single layer feed-forward type of ANN with neat diagram.
- 4. Attempt any THREE of the following : 12**
- a) Classify types of machine learning. Describe any one.
 - b) Describe Binary, Multiclass and Multilabel classification of supervised machine learning.
 - c) Explain key points of hierarchical clustering in unsupervised algorithm.
 - d) Describe working of forward pass in ANN.
 - e) Describe key points of random forest algorithm.
- 5. Attempt any TWO of the following : 12**
- a) Write python program to implement of simple linear regression algorithm.
 - b) Describe working of unsupervised machine learning algorithm.
 - c) Explain case study of following applications of ML in robotics.
 - i) ML based pick and place robots.
 - ii) Medical robots using unsupervised ML.
- 6. Attempt any TWO of the following : 12**
- a) Compare supervised and unsupervised ML methods.
(Any six points)
 - b) Differentiate single layer feed-forward and multi-layer feed-forward neural networks.
 - c) Describe Model-based and data-driven robotic systems w.r.t ML in robotics.
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