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[6181]-404

B.E. (AI & DS)

MACHINE LEARNING

(2019 Pattern) (Semester - VII) (417521)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

1) *Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.*
2) *Neat diagrams must be drawn wherever necessary.*
3) *Figures to right indicate full marks.*

Q1) a) Apply K-Nearest Neighbor Algorithm (KNN) on following data. Predict the student result for values physics = 6 marks, Chemistry = 8 marks. Consider number of neighbours K = 3 and Euclidean Distance as distance measure. **[12]**

Physics (marks)	Chemistry (marks)	Results
4	3	Fail
6	7	Pass
7	8	Pass
5	5	Fail
8	8	Pass

b) Explain support Vector Machine classification algorithm with suitable example. **[6]**

OR

Q2) a) Explain any 4 evaluation measures of Binary classification with example? **[6]**

b) Explain construction of multi-classifier. **[6]**

  i) One Vs. All approach

  ii) One Vs One approach

c) Differentiate between Binary - vs - Multiclass Classification. **[6]**

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Q3) a) Explain K - Means clustering algorithm and states the advantages and disadvantages of k-means clustering algorithm. **[9]**

b) Explain Gaussian mixture model with example. **[8]**

OR

Q4) a) Elaborate need of clustering and explain how the elbow method is used to decide the value of cluster k. **[9]**

b) Explain Divisive Hierarchical clustering (DHC) algorithm with example.**[8]**

Q5) a) Differentiate the Bagging and Boosting approach of ensemble learning.**[6]**

b) Explain different types of voting mechanisms in ensemble learning. **[6]**

c) Explain AdaBoost algorithm in detail. **[6]**

OR

Q6) a) Compare Homogeneous and Heterogeneous ensemble methods. **[6]**

b) What is the ensemble learning? Explain any two ensemble learning techniques. **[6]**

c) Explain random forest ensembles with an example. **[6]**

Q7) a) Explain following terms: **[8]**
   i) Markov Property
   ii) Bellman Equation
   iii) Markov Reward Process
   iv) Markov Chain

b) Explain Q-Learning algorithm with an example. **[9]**

OR

Q8) a) What is Reinforcement Learning? Explain the real time applications of reinforcement learning. **[8]**

b) Explain following terms : **[9]**
   i) Supervised Learning.
   ii) Unsupervised Learning.
   iii) Reinforcement Learning.

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