

6E7102

Total No. of Questions : 22

Total No. of Pages : 04

Roll No. :

6E7102

B.Tech. VI-Sem. (Main/Back) Exam. - 2024

**COMPUTER SCIENCE AND ENGINEERING
(Artificial Intelligence)**

6CAI4-02 / Machine Learning

CS, IT, AID, CAI

Time : 3 Hours

Maximum Marks : 70

Instructions to Candidates :

Attempt all ten questions from Part-A, five questions out of seven questions from Part-B and three questions out of five questions from Part-C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used / calculated must be stated clearly.

Use of following supporting material is permitted during examination.

(Mentioned in Form No. 205)

1. Nil

ersahilkagyan.com

2. Nil

PART-A

[10×2=20]

(Answer should be given up to 25 words only)

All questions are compulsory

Q. 1. What do you mean by Maximum Marginal Hyperplane (MMH in SVM)?

- Q. 2. Differentiate between 2-layer neural network and 3-layer neural network.
- Q. 3. Give advantages of content based filtering.
- Q. 4. Differentiate between feature extraction and selection.
- Q. 5. What do you understand by false negative in confusion matrix?
- Q. 6. Define attribute selection measure in classification.
- Q. 7. Write any four requirements of Clustering Algorithm.
- Q. 8. How do you compute support for a transactional database? Give example.
- Q. 9. What is Markov Property? Express it mathematically.
- Q. 10. Give your intuition about following :
- (a) Markov Reward Process (MRP)
 - (b) Bellman Equation

PART-B

[5×4=20]

(Analytical/Problem solving questions)

Attempt any five questions

- Q. 1. List the important steps of policy evaluation using Monte Carlo.
- Q. 2. Differentiate between following for reinforcement learning :
- (a) Value iteration and policy iteration
 - (b) On-policy and off-policy
- Q. 3. What do you mean by optimal policy in an MDP environment? How do we find an optimal policy? Give example.
- Q. 4. How is distance computed for attributes that are not numeric, but are categorical in k-nearest neighbor classifier? Give example.
- Q. 5. How to define inter-cluster similarity in Hierarchical clustering? Give example of each approach.
- Q. 6. What are advantages of 'Naive' Bayesian classifier? Briefly outline major steps of the algorithm.
- Q. 7. What is the use of PCA in Machine Learning? Give the steps of PCA algorithm.

(Descriptive/Analytical/Problem Solving/Design question)**Attempt any three questions**

- Q. 1. Consider following eight points (with (x,y) represents location) $A_1(2,10)$, $A_2(2,5)$, $A_3(8,4)$, $B_1(5,8)$, $B_2(7,5)$, $B_3(6,4)$, $C_1(1,2)$, $C_2(4,9)$. The distance function is Euclidean distance cluster these eight points into three clusters using k-means algorithm with showing all necessary steps.
- Q. 2. What is multilayer neural network? Explain Back propagation Learning Algorithm.
- Q. 3. Explain the following with example :
- Decision-Tree Algorithm
 - Linear Regression
- Q. 4. Write short notes on the following :
- Collaborative filtering
 - Evaluating machine learning algorithms and model selection
- Q. 5. Consider following transactional database with min-sup = 60% and min-conf = 80%.

TID	Item Bought
T ₁	{M, O, N, K, E, Y}
T ₂	{D, O, N, K, E, Y}
T ₃	{M, A, K, E}
T ₄	{M, U, C, K, Y}
T ₅	{C, O, O, K, I, E}

and construct the following using FP Growth algorithm :

- FP - Tree
- Conditional Pattern base
- Conditional FP-tree

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