B.E. Eighth Semester (Information Technology) (C.B.S.)

Elective - III : Machine Learning

P. Pages : 2

NKT/KS/17/7623

Time : Three Hours

0547

Max. Marks : 80

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Notes : 1. Solve Question 1 OR Questions No. 2.
2. Solve Question 3 OR Questions No. 4.
3. Solve Question 5 OR Questions No. 6.
4. Solve Question 7 OR Questions No. 8.
5. Solve Question 9 OR Questions No. 10.
6. Solve Question 11 OR Questions No. 12.
7. Due credit will be given to neatness and adequate dimensions.
8. Assume suitable data whenever necessary.
9. Illustrate your answers whenever necessary with the help of neat sketches.

1.	a)	What is machine learning? Explain applications of machine learning.	**7**
	b)	Explain the process of designing a learning system.	**6**

OR

2.	a)	Explain the Bias-Variance – decomposition in detail.	**7**
	b)	Explain the examples of machine learning problem.	**6**
3.	a)	Explain the ways in which the supervised learning Problems that can be generalized.	**5**
	b)	Explain the linear model for classification.	**5**
	c)	Differentiate between supervised and unsupervised learning techniques.	**4**

OR

4.	a)	Explain back propagation learning technique. Also, Explain algorithm for back – propagation.	**6**
	b)	Explain dual perception algorithm with example. Also explain margin of a classifier.	**8**
5.	a)	Explain the algorithm for K-means clustering technique with example.	**7**
	b)	Explain the concept of dimensionality reduction. Explain advantages of dimensionality reduction.	**7**

OR

6.	a)	Explain **any two.**	**14**
		i) Bayesian Neural Networks.	
		ii) Feed forward networks.	
		iii) Probabilistic PCA.	

7.	a)	Explain nearest neighbor classification in detail.	**8**
	b)	Write a note on VC-dimension in detail.	**5**

OR

8.	a)	Write notes on **any four.**	**13**
		i) Empirical Risk.	
		ii) Occam's Razor.	
		iii) Hypothesis class.	
		iv) Trade off	
		v) Inductive bias.	

9.	a)	Explain various real world problems that can be solved by using SVM.	**4**
	b)	Explain bootstrapping, bagging, boosting.	**9**

OR

10.	a)	Explain the concept realizable infinite hypothesis class.	**6**
	b)	Write note on margin based bounds on risks.	**7**

11.	a)	Explain various exploration strategies in detail.	**7**
	b)	Explain basic sampling methods.	**6**

OR

12.	a)	Explain Monte-Carlo algorithm in detail.	**5**
	b)	Write notes on **any two.**	**8**
		i) Accuracy and confidence boosting.	
		ii) Semi-Supervised learning.	
		iii) Temporal difference learning.	

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