

1059
B.E. (Computer Science and Engineering)
Eighth Semester
Elective – IV
CS-802C: Machine Learning and Computational Intelligence

Max. Marks: 50

Time allowed: 3 Hours

NOTE: Attempt five questions in all, including Question No. 1 (Section-A) which is compulsory and selecting two questions each from Section B-C.
x-x-x

Section-A		10																																																
Q1	a) Differentiate between learning vs designing. b) How do bias and variance play out in machine learning? c) Explain following w.r.t Support vector machine---support vector and hyperplane. d) Discuss advantages of Bayesian approach over classical approach to probability. e) Compare supervised, unsupervised and reinforcement learning techniques.																																																	
Section-B		6																																																
Q2	a) Define machine learning. What are the major objectives of machine learning? Discuss some examples of machine learning. b) What do you understand by term learning. Discuss briefly various machine learning models.	4																																																
Q3	a) Differentiate between binary and multiclass classification. b) How to access classification performance? Discuss with suitable example. c) Define linear regression. If you have only one independent variable, how many coefficients will you require to estimate in a simple linear regression model?	3 4 3																																																
Q4	a) Explain the training process of perceptron network with help of suitable example. b) Define Support vector machine. What are the two classification methods that SVM (Support Vector Machine) can handle?	6 4																																																
Section-C		1																																																
Q5	Construct decision tree for following dataset.	0																																																
	<table border="1"> <thead> <tr> <th>Name</th> <th>Hair</th> <th>Height</th> <th>Weight</th> <th>Location</th> <th>Class</th> </tr> </thead> <tbody> <tr> <td>Sunita</td> <td>Blonde</td> <td>Average</td> <td>Light</td> <td>No</td> <td>Yes</td> </tr> <tr> <td>Anita</td> <td>Blonde</td> <td>Tall</td> <td>Average</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>Kavita</td> <td>Blonde</td> <td>Short</td> <td>Average</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>Raji</td> <td>Brown</td> <td>Short</td> <td>Heavy</td> <td>No</td> <td>Yes</td> </tr> <tr> <td>Sushma</td> <td>Red</td> <td>Average</td> <td>Heavy</td> <td>No</td> <td>Yes</td> </tr> <tr> <td>Ramésh</td> <td>Brown</td> <td>Tall</td> <td>Heavy</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>Shevta</td> <td>Brown</td> <td>Average</td> <td>Light</td> <td>Yes</td> <td>No</td> </tr> </tbody> </table>	Name	Hair	Height	Weight	Location	Class	Sunita	Blonde	Average	Light	No	Yes	Anita	Blonde	Tall	Average	Yes	No	Kavita	Blonde	Short	Average	Yes	No	Raji	Brown	Short	Heavy	No	Yes	Sushma	Red	Average	Heavy	No	Yes	Ramésh	Brown	Tall	Heavy	Yes	No	Shevta	Brown	Average	Light	Yes	No	
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Q6	a) Discuss Generative and discriminative approaches of probabilistic models. b) Discuss the essential steps of K-means algorithm for cluster analysis.	6 4																																																
Q7	a) Define reinforcement learning. What are the issues in reinforcement learning? How they are overcome? b) What are the basic differences between Machine Learning and Deep Learning?	5 5																																																