Institute of Technology, Nirma University
Class Test, February 2018
M.Tech. CSE, MTech CSE (INS), MTech CSE (NT), Semester II
3CS1E35 – Machine Learning

Roll/Exam No 17MCEC07 Supervisor's initial with date

Time: 1 Hour Maximum Marks: 30

Instructions: 1. Attempt all questions in sequence.
2. Figures to the right indicate full marks.
3. Make necessary assumptions wherever needed and clearly indicate the same.
4. Draw neat sketches wherever necessary.

Q.1 What is the significance of Machine Learning in the technological development in present era? Explain with example. [04]

Q.2 Compare the following with appropriate examples: [04]
(a) Supervised learning and unsupervised learning
(b) Classification and regression

Q.3 Consider following data pertaining to employees of some organization: [08]

x (years of experience)	y (salary in thousands of dollars)
3	31
8	58
9	65
13	72
3	36
6	43
11	60
21	90
1	20
16	80

Here, x indicates experience of an employee in years while y indicates salary in thousands of dollars. Using simple linear regression, predict the salary of an employee whose experience is 10 years.

Q.4 Answer the following with appropriate examples. [06]
a) What is the significance of gradient descent in solving optimization problems in machine learning?
b) What is overfitting? How can regularization be used to limit overfitting?

Q.5 Assume following training data: [08]

Example No.	Color	Type	Origin	Stolen?
1	Red	Sports	Domestic	Yes
2	Red	Sports	Domestic	No
3	Red	Sports	Domestic	Yes
4	Yellow	Sports	Domestic	No
5	Yellow	Sports	Imported	Yes
6	Yellow	SUV	Imported	No
7	Yellow	SUV	Imported	Yes
8	Yellow	SUV	Domestic	No
9	Red	SUV	Imported	No
10	Red	Sports	Imported	Yes

Consider "Stolen?" as the class attribute. Classify a Red Domestic SUV using naïve-Bayes classifier.