

# **UNIVERSITY OF EMBU**

## 2016/2017 ACADEMIC YEAR

#### SECOND SEMESTER EXAMINATION

# THIRD YEAR EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE, BACHELOR OF SCIENCE (COMPUTER SCIENCE)

### **CSC 323: MACHINE LEARNING**

**DATE: APRIL 11, 2017** 

TIME: 2:00-4:00PM

## **INSTRUCTIONS:**

Answer Question ONE and ANY other two Questions

### **QUESTION ONE (30 MARKS)**

a) Define the term as used in machine learning

(5 Marks)

- i) Learning.
- ii) Bias.
- iii) Classifier.
- iv) Hypothesis
- v) Over-fitting.
- b) Draw a decision tree to represent the following boolean function: (A XOR B). (2 Marks)
- c) Describe ANY FIVE learning methodologies.

(3 Marks)

d) Give main features of Bayesian learning method.

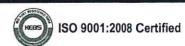
(4 Marks)

e) Describe Four problems that are appropriate to be solved through BACKPROBAGATION.

(4 Marks)

f) Give reasons why Instance-based learning is different from all other approaches.

(4 Marks)



g)	List steps of Rule-pruning method in finding high accuracy hypothesis.	(4 Marks)
h)	Describe Case-based reasoning.	(4 Marks)
QU	JESTION TWO (20 MARKS)	
	Explain the following issues in Decision Tree Learning:	
	i) Over-fitting the data	(5 Marks)
	ii) Continuous-valued attributes.	(5 Marks)
b)	Describe how to derive Gradient Descent Rule.	(10 Marks)
Ωī	JESTION THREE (20 MARKS)	
	Discuss ANY TWO learning methods used in Artificial Neural Networks.	(10 Marks)
a)		
b)	Describe in details ANY FIVE areas that machine learning has been successfully been applied.	
		(10 Marks)
QUESTION FOUR (20 MARKS)		
a)	Give advantages of instance-based learning method.	(6 Marks)
b)	Explain the representational power of Perceptron.	(7 Marks)
c)	Discuss the maximum a posteriori (MAP) hypothesis.	(7 Marks)
QU	JESTION FIVE (20 MARKS)	
a)	Give advantages of converting decision trees to rules before pruning.	(4 Marks)
b)	Explain how Radial Basis Method is a blend of ANN and instanced based learning method.	
		(8 Marks)

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(8 Marks)

c) Explain in details k-Nearest Neighbour learning.