



TECHNICAL UNIVERISTRY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATION FOR DEGREE IN:
BACHELOR OF TECHNOLOGY IN INFORMATION TECHNOLOGY
(BTIT M1/J-FT – Y4 S2)

EIT 4417: NEURAL NETWORK

END OF SEMESTER EXAMINATION
SERIES: DECEMBER 2014
TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions. Attempt question **ONE (Compulsory)** and any other **TWO** questions
Maximum marks for each part of a question are as shown

This paper consists of **TWO** printed pages

Question One (Compulsory)

- a) Explain the meaning of the following terms in respect to neural networks:
- (i) Neural network
 - (ii) Artificial neurons
 - (iii) Artificial neural network
 - (iv) Threshold in artificial neuron
 - (v) Multilayer network
- (10 marks)**
- b) Explain FIVE reasons why it has become necessary to study artificial neural networks **(5 marks)**
- c) State FOUR application areas of artificial neural network iterative process of adjustments applied to its synaptic weights and thresholds. Ideally, the network becomes more knowledgeable about its environment after each interaction of the learning process.
- (i) State the THREE broad type of learning **(3 marks)**
 - (ii) Describe the leaning types noted in (i) above **(6 marks)**
- d) Compare the brain and computers with respect to the listed comparison features below:
- (i) Style of computation
 - (ii) Fault tolerance

- (iii) Intelligence and consciousness
- (iv) Adaptive

(4 marks)

Question Two

- a) A recap of the human nervous system can be broken down into three stages that can be represented in block diagram form as:



Explain the function of:

- (i) Receptors
- (ii) Effectors
- (iii) Neural net (Brain)

(6 marks)

Study the diagram below and then answer the subsequent question:

- b) Write down the equation for the output Y_j of a McCulloch-Pitts neuron as a function of its inputs I_i (3 marks)
- c) Explain how the model (figure 2) above works using McCulloch-Pitts neuron function (11 marks)

Question Three

- a) Suppose the credit card company decided to deploy a new system for assessing credit worthiness of its customers. The new system is using a feed forward neural networking with a supervised learning algorithm. Suggest in a form of essay what should the bank have before the system can be used? Discuss problems associated with this requirement. (10 marks)
- b) Describe the main steps of the supervised training algorithm (6 marks)
- c) State TWO drawbacks of supervised learning (4 marks)

Question Four

- a) (i) What is a training set in neural networks? (3 marks)
(ii) How is it used to train neural network? (5 marks)
- b) Outline FIVE characteristics of Hopfield network (5 marks)
- c) Describe the learning in a Hopfield network (7 marks)

Question Five

- a) Write short notes on the following items: (12 marks)
(i) Supervised learning
(ii) Unsupervised learning
(iii) Reinforced learning
- b) Explain the working of the least mean square algorithm (8 marks)