



MAASAI MARA UNIVERSITY

**UNIVERSITY EXAMINATIONS
2018/2019 ACADEMIC YEAR
(REGULAR)**

**SCHOOL OF SCIENCE AND INFORMATION
SCIENCES**

**FOURTH YEAR SECOND SEMESTER
EXAMINATION**

**BACHELOR OF SCIENCE IN COMPUTER
SCIENCE**

COURSE CODE: COM 424E

COURSE TITLE: NEURAL NETWORKS

DATE: 18TH APRIL 2019

TIME: 1430 - 1630 HRS

INSTRUCTIONS TO CANDIDATES:

**ANSWER ALL QUESTIONS IN SECTION A AND ANY 2 QUESTIONS IN
SECTION B**

Duration of the examination: 2 Hours

SECTION A (COMPULSORY – 30 MARKS)**SECTION A: COMPULSORY****QUESTION ONE**

- a) Define the term
- i. Neural Networks [2 Marks]
 - ii. Artificial neurons [2 Marks]
 - iii. “Artificial Neural Network” [2 Marks]
- b) State six importance of Neuron Network [6 Marks]
- c) Explain two basic goals for neural network research [4 Marks]
- d) Outline the two learning Processes in Neural Networks [2 Marks]
- e) Explain three broad types of learning in NN [6 Marks]

SECTION B [40 MARKS]**QUESTION TWO**

- a. Discuss four real world application of NN [8 Marks]
- b. Explain the following terms in reference to NN in relation to human nervous system
- i. Receptors [2 Marks]
 - ii. Effectors [2 Marks]
 - iii. neural net (brain) [2 Marks]
- c. Explain Three distinction between Brains and Computers [6 Marks]

QUESTION THREE

- a. Outline the hierarchical levels of the organization in the brain [8 Marks]
- b. Draw a detailed diagram of NN according to ‘The McCulloch-Pitts Neuron’ [6 Marks]
- c. Explain How the Model Neuron Works [6 Marks]

QUESTION FOUR

- a. Write down the equation for the output Y_j of a McCulloch-Pitts neuron as a function of its inputs I_i . [4 Marks]
- b. Explain any four the properties of ANN [8 Marks]
- c. Given the following set
Training set S of examples $\{\mathbf{x}, \mathbf{t}\}$
- a. \mathbf{x} is an input vector and
 - b. \mathbf{t} the desired target vector
 - c. Example: Logical And

Where:

$$S = \{(0,0),0\}, \{(0,1),0\}, \{(1,0),0\}, \{(1,1),1\}$$

- i. Provide the iterative process function [3 Marks]
- ii. State the Learning rule [3 Marks]

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