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 Yj of a McCulloch-Pitts neuron as a function of its inputs Ii. [4 Marks]
b. Explain any four the properties of ANN [8 Marks]
c. Given the following set
   Training set S of examples **{x, t}**
   a. **x** is an input vector and
   b. **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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