(Knowledge for Development)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS
2019/2020 ACADEMIC YEAR

END OF SEMESTER EXAMINATIONS
YEAR FOUR SEMESTER TWO

FOR THE DEGREE OF
COMPUTER SCIENCE

COURSE CODE : **CSC 468E**

COURSE TITLE : **NEURAL NETWORKS**

DATE: 06/11/2020 **TIME: 9.00 A.M – 11:00 A.M**

INSTRUCTIONS:

ANSWER QUESTIONS ONE and ANY OTHER TWO

QUESTION ONE [COMPULSORY] [30 MARKS]

a) With the aid of a diagram describe the refractory period   [4 marks]

b) Using a diagram describe a perceptron.   [4 marks]

c) State the FOUR types of *Neural* output function and draw relevant diagram for each neural output function.   [4 marks]

d) Describe recurrent neural network.   [6 marks]

e) Explain the application area of recurrent neural network   [4 marks]

f) Explain the Cohen -Grossberg theorem   [4 marks]

g) Describe the gradient error Minimizations.   [4 marks]

QUESTION TWO [20 MARKS]

a) Explain TWO positive components of error function   [4 marks]

b) Describe FOUR approaches to improving generalization   [4 marks]

c) Neural networks applications fall into TWO basic types. State and Explain the TWO types.   [4 marks]

d) Explain the steps of training a TWO layer multilayer perceptron.   [8 marks]

QUESTION THREE [20 MARKS]

a) Committee machines are combinations of TWO or more Neural Networks that can be made to perform better in individual networks. There are TWO major categories. State and describe the TWO major categories.   [4 marks]

b) Describe FOUR major components of Self organization Maps   [8 marks]

c) Explain the steps of self organizing map algorithm.   [8 marks]

QUESTION FOUR [20 MARKS]

a) Describe the advantages of neural networks.   [4 marks]

b) Draw and Name the parts of a Fuzzy inference system   [5 marks]

c) Explain the functional blocks of fuzzy inference system.   [5 marks]

d) Describe the THREE characteristics of fuzzy inference system.   [6 marks]

QUESTION FIVE [20 MARKS]

a) Describe how neural networks can be applied in health sector and geographic information system (GIS). [5 marks]

b) Using a diagram show a mathematical representation of an activation function of a neuron. Clearly label the parts. [6 marks]

c) Compare supervised learning, unsupervised learning and reinforcement learning. [9 marks]