Machakos University

ISO 9001:2008 Certified

University Examinations for 2015/2016 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

Supplementary

SCO411 **Neural Networks**

Date: /08/2018 Time: 2 HOURS

Instruction
Answer question **ONE** and **Any** other **Two** among the four selective questions

Question one (Compulsory)

(a) Differentiate between neural networks (NN) and Artificial Neural Networks (ANN) **(4 Marks)**

(b) Identify and explain three broad types of learning in ANN **(9 Marks)**

(c) Discuss the components of Artificial Neural Network including the model of *McCulloch-Pitts Neuron* **(10 Marks)**

(d) Using a typical example, explain the application of ANN in Computer Games **(7 Marks)**

Question two

a) State any five reasons for studying ANN **(5 Marks)**

b) Explain the following neural network tasks **(6 Marks)**

i. Control

ii. Classification

iii. Prediction

c) A student would like to decide whether to attend a wedding party or not. The decision variables are weather condition, availability of transport, and completion of assignment. Model the decision with respect to Artificial Neural Network. **(9 Marks)**

Question three

a) Explain the following parts of the human Nervous System **(6 Marks)**

i. receptors

ii. effectors

iii. neural net (brain)

b) State any five properties and capabilities of Neural Networks **(5 Marks)**

c) Use the equation $Y_1(t) = [\ X_1(t-1)\ ]$ XOR $[\ X_2(t-3)$ AND NOT $X_2(t-2)\ ]$ to fill the table below. **(6 Marks)**

X2(t – 3)	X2(t – 2)	AND NOT	X1(t – 1)	XOR

d) Identify any three tools for modeling neural networks **(3 Marks)**

Question four:

a) Discuss ANN topologies **(9 Marks)**

b) Explain Hopfield learning algorithm **(8 Marks)**

c) Explain the equation $Dis\tan ce(LMS) = \frac{1}{2}\sum_{P}(T_P - O_P)^2$ **(3 Marks)**

Question five:

a) Using diagrams, demonstrate the implementation of the logic gates below using McCulloch-Pitts neurons **(9 Marks)**

i. AND

ii. OR

iii. NOT

b) Explain the applications of Neural Networks in Pattern recognition **(5 Marks**

c) Explain the three phases of training ANN by back propagation **(6 Marks)**