



MACHAKOS UNIVERSITY

University Examinations for 2020/2021 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FOURTH YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE (COMPUTER SCIENCE)

SCO 411: NEURAL NETWORKS

DATE: 25/3/2021

TIME: 8.30-10.30 AM

INSTRUCTION: Answer Question ONE and any other TWO Question

QUESTION ONE (30 MARKS) (COMPULSORY)

- a) List any four
 - i. advantages of neural networks over human brain (5 marks)
 - ii. activation functions (4 marks)
- b) Explain any three functions used in neural networks (6 marks)
- c) Describe the following elements of a neural network (9 marks)
 - i. Input Layer
 - ii. Hidden
 - iii. Output Layer
- d) Model a rain prediction using neural network (6 marks)

QUESTION TWO (20 MARKS)

- a) Describe the three types of learning method in neural networks (9 marks)
- b) Explain any three reasons for studying neural networks (6 marks)
- 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. (10 marks)

QUESTION THREE (20 MARKS)

- a) Differentiate between the following with respect to Neural Networks (10 marks)
 - i. Neural network and artificial neural network
 - ii. Bias and threshold
 - iii. Input and output
 - iv. Neuron learning and learning rate
 - v. Effectors and receptors
- b) List six steps for general procedure for building a artificial neural network (6 marks)
- c) List any four properties and capabilities of Neural Networks (4 marks)

QUESTION FOUR (20 MARKS)

- a) Describe how artificial network works (5 marks)
- b) Draw a neural network model according to *McCulloch-Pitts Neuron* (6 marks)
- c) List any three neural network tools (3 marks)
- d) Explain the following three sets of data (6 marks)
 - i. Training dataset
 - ii. Validation dataset
 - iii. Test dataset

QUESTION FIVE (20 MARKS)

- a) Describe Hope Field learning algorithm (6 marks)
- b) Discuss the application of Logic gates in neural networks (9 marks)
- c) List any five ANN topologies (4 marks)