MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

SECOND YEAR SECOND SEMESTER EXAMINATION FOR

DIPLOMA IN INFORMATION AND COMMUNICATION TECHNOLOGY

DIT208: ARTIFICIAL INTELLIGENCE

DATE: 22/10/2020 **TIME: 8.30-10.30 AM**

INSTRUCTIONS

Answer question ONE and any other TWO questions.

QUESTION ONE (30 MARKS) COMPULSORY

a) Explain *machine learning* as used in A.I. (2 marks)

b) Explain briefly the differences between:

i. Depth-first search and iterative deepening search. (4 marks)

ii. State space search and game tree evaluation. (4 marks)

iii. Top-down parsing and bottom-up parsing. (4 marks)

c) Even though the implementation of Artificial Intelligence systems has been associated with so many benefits, there are some security concerns as a result. Outline three security concerns and ways on how they can be addressed. (6 marks)

d) Discuss two properties of agent environments. (4 marks)

e) Explain the following types of intelligence.

i. Logical-Mathematical intelligence (2 marks)

ii. Bodily-Kinesthetic intelligence (2 marks)

iii. Spatial intelligence (2 marks)

QUESTION TWO (20 MARKS)

a) Differentiate between *Perception* and *Reasoning* components of A.I and how they can be implemented. (4 marks)

b) Various organizations around the globe have embarked on a mission to implement A.I enabled systems. Discuss four advantages of A.I as used in today's daily chores. (8 marks)

c) Using examples explain the following types of Rule Based Systems

i. Forward chaining (4 marks)

ii. Backward chaining (4 marks)

QUESTION THREE (20 MARKS)

a) Difference between Human and Machine Intelligence. (4 marks)

b) Differentiate between Supervised and Unsupervised Learning as used in machine learning. (4 marks)

c) Outline four limitations of expert systems. (4 marks)

d) Explain Natural Language Processing as used in AI. (2 marks)

e) Explain three challenges facing speech recognition technology. (6 marks)

QUESTION FOUR (20 MARKS)

a) Outline four properties of a good knowledge representation system. (4 marks)

b) Explain three reasons as to why Image Recognition is a Key Function of AI. (6 marks)

c) Elaborate three applications of A.I (6 marks)

d) Explain the following types of Knowledge acquisition as used in A.I.

i. Adaptive Learning (2 marks)

ii. Motor Learning (2 marks)

QUESTION FIVE (20 MARKS)

a) With the aid of a well labeled diagram, explain the components of an expert system. (4 marks)

b) In 'Artificial Intelligence' discuss areas where the Bayes rule can used. (4 marks)

c) Differentiate programming without A.I and with A.I (4 marks)

d) Discuss four current applications of ***robotics*** in the world today. (8 marks)