



THE CATHOLIC UNIVERSITY OF EASTERN AFRICA
A. M. E. C. E. A

GABA CAMPUS - ELDORET

MAIN EXAMINATION

JANUARY – APRIL 2023

FACULTY OF SCIENCE

DEPARTMENT OF COMPUTER AND INFORMATION SCIENCE

BACHELOR OF SCIENCE IN COMPUTER SCIENCE

CMT 208: INTRODUCTION TO ARTIFICIAL INTELLIGENCE

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DATE: April 2023

Duration: 2 Hours

INSTRUCTIONS: Answer Question ONE and any other TWO Questions

Q1.

- a) Define the following terminologies as used in Artificial Intelligence **(7 Marks)**
- i) Rationality
 - ii) AI Agent
 - iii) Fuzzy Logic
 - iv) Natural Language Processing
 - v) Expert Systems
 - vi) Computer Vision
 - vii) Heuristics
- b) The intelligence is intangible. Describe the components of Intelligence **(5 Marks)**
- c) Differentiate between Speech and Voice Recognition **(8 Marks)**
- d) Describe the properties of environment in Artificial Intelligence **(7 Marks)**
- e) Fuzzy logic is useful for commercial and practical purposes. Discuss those **(3 Marks)**

Q2.

- a) Describe the various Applications of Robotics **(5 Marks)**

- b) Humans developed AI systems by introducing into them every possible intelligence they could, for which the humans themselves now seem threatened. Discuss the Artificial Intelligence issues **(5 Marks)**
- c) Briefly discuss the following search algorithms terminologies **(10 Marks)**
- i) Problem Space
 - ii) Problem Instance
 - iii) Problem Space Graph
 - iv) Depth of a problem
 - v) Space Complexity
 - vi) Time Complexity
 - vii) Admissibility
 - viii) Branching Factor
 - ix) Depth

Q3.

- a) What is a Robot? And what are the components of a Robot **(6 Marks)**
- b) Briefly discuss the general five steps of Natural Language Processing **(10 Marks)**
- c) Define knowledge as used in expert systems, giving the components of knowledge base **(4 Marks)**

Q4.

- a) Fuzzy Logic Systems Architecture has four main parts. Describe those **(8 Marks)**
- b) What are the advantages and disadvantages of Fuzzy Logic Systems **(6 Marks)**
- c) Describe various applications of Neural Networks **(6 Marks)**

Q5.

- a) What are Artificial Neural Networks (ANNs)? **(2 Marks)**
- b) Discuss the Components of Natural Language Processing **(8 Marks)**
- c) In case of knowledge-based Expert Systems, the Inference Engine acquires and manipulates the knowledge from the knowledge base to arrive at a particular solution. The Inference Engine use **Forward Chaining** and **Backward Chaining** strategies to recommend a solution. Discuss those two strategies **(10 Marks)**

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