



MACHAKOS UNIVERSITY

University Examinations for 2020/2021 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)

SCO113: FOUNDATIONS OF ARTIFICIAL INTELLIGENCE

DATE: 22/3/2021

TIME: 2.00-4.00 PM

INSTRUCTION: Answer Question ONE and any other TWO Question

QUESTION ONE (30 MARKS)

- a) Explain the term intelligence. (2 marks)
- b) Discuss any four properties of agents. (8 marks)
- c) Discuss three types of intelligence.
- d) Discuss three applications of AI (6 marks)
- e) Show the values of the statement below in a truth table and make a conclusion on its result.
$$\neg (\neg (P \wedge Q) \rightarrow (\neg P \vee \neg Q))$$
 (4 marks)
- f) Write the following statements in predicate logic.
 - i. Some barking dogs are irritating
 - ii. All Kenyans are either loyal to or hate their country. (2 marks)

QUESTION TWO (20 MARKS)

- a) Discuss the following Inference Systems
 - i. Forward chaining (4 marks)
 - ii. Case based Reasoning (4 marks)

- b) Discuss *Natural Language processing* as a key area in Artificial intelligence based on the following titles. (12 marks)
- i. Overview
 - ii. State of the art
 - iii. Current Applications
 - iv. Potential Applications
 - v. Challenges and Open Issues
 - vi. Conclusion

QUESTION THREE (20 MARKS)

- a) Differentiate between Human Intelligence and Artificial Intelligence with examples (6 marks)
- b) Discuss four ways through which KRA can apply A.I in their operations (8 marks)
- c) An AI specialist wants to use uninformed strategy to solve a given defined problem. Explain any four options he may use in this case. (8 marks)

QUESTION FOUR (20 MARKS)

- a) With the aid of a well labeled diagram, explain the components of a knowledge based system. (10 marks)
- b) Discuss the relationship between AI and mathematics (4 marks)
- c) Difference between Minimax and Alpha beta algorithms of game playing. (4 marks)
- d) Explain machine learning as used in AI. (2 marks)

QUESTION FIVE (20 MARKS)

- a) Explain five techniques that can be used for heuristics search. (10 marks)
- b) You have been selected to be part of the team that is assigned the task of developing a knowledge based system. Describe the phases your team must undertake in the process of acquiring knowledge for the system. (10 marks)