



MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

SECOND YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE (COMPUTER SCIENCE)

SCO 205/SCO 113: FOUNDATIONS OF ARTIFICIAL INTELLIGENCE

DATE: 21/1/2021

TIME: 2:00 – 4:00 PM

INSTRUCTIONS

INSTRUCTIONS: Answer Question One and Any Other Two questions in this paper

QUESTION ONE

- a) Explain the term intelligent agent. (2 marks)
- b) Discuss any four properties of agent environments. (8 marks)
- c) Explain the following types of intelligence.
 - i. Logical-Mathematical intelligence (2 marks)
 - ii. Bodily-Kinesthetic intelligence (2 marks)
 - iii. Spatial intelligence (2 marks)
- d) Describe the functionality of the following AI components and how they are implemented.
 - i. Perception (2 marks)
 - ii. Reasoning (2 marks)
 - iii. Action (2 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) Using examples explain the following types of Rule Based Systems
 - i) Forward chaining (4 marks)
 - ii) Backward chaining (4 marks)
- b) Discuss ***Machine vision and image 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 FOUR (20 MARKS)

- a) Differentiate programming without A.I and with A.I (6 marks)
- b) Discuss four ways through which Kapa Oil Industry 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 FIVE (20 MARKS)

- a) With the aid of a well labeled diagram, explain the components of an expert system. (10 marks)
- b) Justify the statement that “Artificial Intelligence is Multi-disciplinary” (4 marks)
- c) Difference between Human and Machine Intelligence. (4 marks)
- d) Explain Natural Language Processing as used in AI. (2 marks)