



COLLEGE OF ENGINEERING AND APPLIED SCIENCES (CEAS)

NCSC301: ARTIFICIAL INTELLIGENCE

END OF SECOND SEMESTER EXAMINATIONS

APRIL 2025

LECTURER: MRS L. TEMBANI-FUNDISI

DURATION: 3 HOURS

INSTRUCTIONS

Section A compulsory

Answer ANY 3 (three) Questions in **Section B**

All question carries equal marks (25)

Begin your answer to each question on a fresh page

Logical answering, smartness and use of examples will earns more marks

Section A (Compulsory)

Answer all questions

Question One

Give a description of the task environment of agent types listed below:

- i. Medical diagnosis system
- ii. Satellite image analysis system
- iii. Part-picking robot
- iv. Refinery controller
- v. Interactive Artificial Intelligence (AI) Tutor

[25 marks]

Section B

Answer any 3 questions

Question Two

- a) Expert Systems are crucial component of AI. Explain briefly the role of a *knowledge base* in an Expert System. **[10 marks]**
- b) Describe the steps involved in designing an Expert System. In your response identify the limitations and how can they be overcome. **[15 marks]**

Question Three

- a) Identify and briefly the main components of a robot. **[10 marks]**
- b) With the aid of examples explain the challenges and opportunities surrounding the use of robots in any industry or country of your choice. **[15 marks]**

Question Four

Discuss the role of fuzzy logic in AI and compare it with probability theory. Provide examples of where fuzzy logic can be applied in real-world scenarios in the enhancement of AI performance.

[25 marks]

Question Five

Discuss the social and ethical considerations in the application of AI. How can society ensure that AI technologies are used responsibly?

[25 marks]

Question Six

Explain the following given terms that represent different concepts related to model building, data processing, and algorithms.

- a) Linear regression
- b) Feature engineering
- c) Decision trees
- d) Support vector machine
- e) K-nearest neighbors.

[25 marks]

END OF EXAMINATION