COLLEGE OF ENGINEERING AND APPLIED SCIENCES

NCSC301-ARTIFICIAL INTELLIGENCE

END OF FIRST SEMESTER EXAMINATIONS

NOVEMBER 2023

LECTURER : MRS L. TEMBANI-FUNDISI

DURATION : 3 HOURS

INSTRUCTIONS

Answer any 4 (four) questions

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

Question One

a) Briefly explain the Alan Turing Test contribution to AI (5)

b) With the aid of examples explain the following features of an environment

    i.   Deterministic

    ii.   Stochastic

    iii.   Partially observable

    iv.   Episodic (8)

c) Explain the 4 main components of a learning agent (12)

Question Two

a) What is an activation function in neural networks (5)

b) Explain the following in neural networks

    i.   Sigmoid

    ii.   ReLu

    iii.   Tanh

    iv.   Softmax (12)

c) Use a clearly labelled diagram to explain the key components of a neural network (8)

Question Three

Use appropriate diagram to describe the fuzzy logic system architecture and show how this architecture can be used in an industrial application area of your choice. (25)

Question Four

Discuss the ethical challenges of AI in employment and workforce automation. How does the increasing use of AI and automation impact job security, economic inequality, and social welfare? What measures can be implemented to address these challenges? (25)

Question Five

Use a diagram to clearly define the components of an expert system and its application in the following areas

       i.   Automobiles

     ii.   Health

    iii.   Tourism

    iv.   Agriculture

     v.   Construction   (25)

Question Six

Using any 5 agents of your choice, give a Performance Environment Actuator Sensor (PEAS) description of the task environments and characterize it in terms of their properties.   (25)

END OF EXAMINATION