PAN AFRICA CHRISTIAN UNIVERSITY

BACHELOR OF BUSINESS INFORMATION TECHNOLOGY AND BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY

END OF TERM EXAMINATION

DEPARTMENT: **COMPUTING & INFORMATION TECHNOLOGY**

COURSE CODE: **BSIT 211|DICT0214**

CAMPUS: **ROYSAMBU**

COURSE TITLE: **INTRODUCTION TO ARTIFICIAL INTELLIGENCE**

EXAM DATE: **MONDAY 27TH JULY ,2026**

TIME: **11:30PM -2:30PM**

INSTRUCTIONS

- This exam script has **TWO (2)** sections.
- Read all questions carefully before attempting.
- Answer All questions in Section **A** and any other THREE questions in Section **B.**
- Write only your **student number** on the answer booklet provided.

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SECTION A (Answer ALL questions)

QUESTION ONE (15 Marks) Compulsory

a) Describe Artificial Intelligence and explain two characteristics that distinguish intelligent systems from conventional computer systems. (4 Marks)

b) Diferentiate between human intelligence and artificial intelligence using two examples. (3 Marks)

c) A university intends to implement an AI-based academic advising system.

i. Identify two benefits of using AI in the system. (2 Marks)
ii. State two challenges that may be encountered during implementation. (2 Marks)

d) Explain four main components of intelligent agent (4 Marks)

SECTION B: (ANSWER ANY THREE (3) QUESTIONS IN THIS SECTION)

QUESTION TWO (15 marks)

A logistics company uses an AI-based navigation system to determine the best routes for its delivery vehicles. The system evaluates traffic conditions, road closures, and travel distances before recommending a route.

a) Describe a search problem in Artificial Intelligence. (2 Marks)

b) Explain four components of problem formulation using the above case study.

(4 Marks)

c) Distinguish between uninformed search and informed search techniques. (4 Marks)

d) Explain how heuristics can improve route selection in the navigation system.

(3 Marks)

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e) Explain two limitation of search-based problem solving. (2 Marks)

QUESTION THREE (15 Marks)

a) Briefly explain the meaning of the following concepts with reference to artificial intelligence

i. Heuristics (2 Marks)

ii. State (2 Marks)

b) Distinguish between deductive and inductive reasoning. Give one example for each case. (4 Marks)

c) Explain three reasons why we study games in artificial intelligence (3 Marks)

d) State and explain four disciplines that contribute to artificial intelligence field of study. (4 Marks)

QUESTION FOUR (15 Marks)

a) Explain the meaning of knowledge representation. (2 Marks)

b) Differentiate between propositional logic and predicate logic. (4 Marks)

c) Construct a semantic network for the following statements: (4 Marks)

i. Doctor is a person
ii. Doctor works in a hospital
iii. Mary is a doctor
iv. Mary specializes in cardiology

d) Explain the role of rules and frames in knowledge representation. (3 Marks)

e) Describe two benefits of knowledge representation in AI systems. (2 Marks)

QUESTION FIVE (15 Marks)

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A hospital uses an Expert System to assist doctors in diagnosing diseases. The system contains medical knowledge from specialists and analyzes patients' symptoms, medical history, and laboratory results before providing recommendations.

a) Define an Expert System. (2 Marks)

b) Describe the role of the knowledge base in an Expert System. (3 Marks)

c) Explain the function of the inference engine and how it can be applied in the above case study. (4 Marks)

d) Describe the importance of the user interface in an Expert System. (3 Marks)

e) Explain one advantage and one limitation of using Expert Systems in healthcare decision making. (3 Marks)

QUESTION SIX (15 Marks)

a) Explain the following AI application areas:

i. Natural Language Processing (NLP) (2 Marks)

ii. Speech Recognition (2 Marks)

iii. Computer Vision (2 Marks)

b) Describe three applications of robotics in modern society. (3 Marks)

c) Explain four characteristics of intelligent agents. (4 Marks)

d) Discuss two advantages of multi-agent systems in distributed AI environments. (2 Marks)

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