

**PAN AFRICA CHRISTIAN UNIVERSITY
BACHELORS OF INFORMATION COMMUNICATION TECHNOLOGY
END OF TERM EXAMINATION**

DEPARTMENT: COMPUTING & INFORMATION TECHNOLOGY
COURSE CODE: BSIT310
CAMPUS: ROYSAMBU
COURSE TITLE: KNOWLEDGE BASED SYSTEM
EXAM DATE: **FRIDAYxxxxx/AUGUST**
TIME: **START HOUR:2.00-5.00PM**

INSTRUCTIONS

- This exam carry a total of SIX Questions of [10 Marks Each]
- Section One (I) is compulsory.
- Answer any 3(Three) Questions from Section Two (II)
- Read all questions carefully before attempting.

SECTION A
(Answer ALL questions in this section)

QUESTION ONE (10 Marks)

- a) Differentiate between the following terms as used in knowledge based systems. (2 marks)
 - i. Forward chaining and backward chaining
 - ii. Semantic net and frame
- b) Define the term Knowledge based information Systems. (2 Marks)
- c) Explain the three challenges of knowledge based systems. (2 Marks)
- d) Discuss the three forms of reasoning used in design of expert system. (2 Marks)
- e) Use a truth table to determine whether the following statement is a tautology, contradiction or contingent statement. Explain your answer. "If I have money and I have transport, then I don't have money or I don't have transport". (2 marks)

SECTION B
((Answer any THREE (3) questions in this section))

QUESTION TWO (10 Marks)

- a) Discuss the ethical implications of deploying Knowledge-Based Systems in sensitive areas like law enforcement or healthcare. How can these concerns be addressed through system design and oversight? (5 Marks)
- b) You are designing a knowledge-based system for medical triage in an emergency room. Identify the key knowledge components (domain knowledge, inference engine, etc.) and explain how each contributes to system performance. (5 Marks)

QUESTION THREE (10 Marks)

- a) Represent the following sentences in predicate logic
- i. Someone is a programmer (2 marks)
 - ii. Ann loves someone (2 marks)
- b) A knowledge based systems (KBSs) are developed to deal with particular application domain in which alternative techniques are unable to produce reliable and manageable solutions. Identify and discuss three aspects of human intelligence that could be used to characterize intelligent knowledge-based systems. (6 marks)

QUESTION FOUR (10 Marks)

- a) Discuss two ethical implications of deploying Knowledge-Based Systems in sensitive areas like law enforcement or healthcare and how can these concerns be addressed through system design and oversight. (4 Marks)
- b) With the advancement of cloud technology, new possibilities for the application of knowledge based systems have opened up. Describe three knowledge based systems application which have been made possible by the availability of cloud technology. (6 marks)

QUESTION FIVE (10 Marks)

- a) Imagine a logistics company wants to develop a KBS to optimize its delivery routes in real-time. Develop a high-level architecture and reasoning process the system would use. Discuss how the system would deal with incomplete or dynamic data. (5 Marks)
- b) Compare and contrast expert systems and conventional software systems. In what contexts is a KBS superior to traditional programming? (5 Marks)

QUESTION SIX (10 Marks)

- a) Discuss two types of agent environment suitable for an internet shopping system. Justify your answer. (2 marks)
- b) Describe how uncertainty is handled in Knowledge-Based Systems. Include methods such as certainty factors, fuzzy logic, or Bayesian reasoning in your answer. (4 marks)
- c) Uncertainty, sometimes occurs due to interaction between different rules about the same information which then are not always compatible. Name any four reasons why this conflict can occur. (4 marks)

EOF