(Knowledge for Development)

KIBABII UNIVERSITY

(KIBU)

UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR

END OF SEMESTER EXAMINATIONS
YEAR FOUR SEMESTER two EXAMINATIONS

FOR THE DEGREE OF
(COMPUTER SCIENCE)

COURSE CODE : CSC 467E

COURSE TITLE : KNOWLEDGE BASED SYSTEMS

DATE: 01/09/2022   **TIME:** 9.00 A.M -11.00 A.M

INSTRUCTIONS TO CANDIDATES

ANSWER **QUESTION ONE** and **ANY OTHER TWO** QUESTIONS

QUESTION ONE (COMPULSORY) [30 MARKS]

a. A knowledge-based system may vary with respect to its problem-solving method or approach. Some systems encode expert knowledge as rules and are therefore referred to as rule-based systems. Another approach, case-based reasoning, substitutes cases for rules. What is knowledge based system? **[2 marks]**

b. An example of a system are the laws and procedures of a democratic government and the way someone organizes their closet. Define a system **[2 marks]**

c. Systems analysts need to know several other important systems concepts. Briefly describe the following Information System Concepts: **[8 marks]**

    i. Decomposition

    ii. Modularity

    iii. Coupling

    iv. Cohesion

d. Give six capabilities that a computer system must possess to pass the Total Turing Test. **[6 marks]**

e. Explain why it would be difficult to develop a KBS for a domain in which there were a considerable reliance on tacit and implicit knowledge. **[6 marks]**

f.

    i. Define the term learning agent. **[2 marks]**

    ii. Give the components of a learning agent **[4 marks]**

QUESTION TWO [20 MARKS]

a. Explain the real world application of knowledge based systems in agriculture. Give examples of applications currently available in the market. **[6 marks]**

b. Systems development is systematic process which includes phases such as planning, analysis, design, deployment, and maintenance. Differentiate between Systems Analysis and Systems Design **[4 marks]**

c. An expert system shell is a tool that has been specifically designed to enable speedy development of expert systems. Give at least **one** example of a shell and state **four** features associated with it an expert system shell. **[6 marks]**

d. Explain the **four** features associated with it an expert system shell, mentioned above

[4 marks]

QUESTION THREE [20 MARKS]

a. Give some of the real world examples of knowledge based system. [4 marks]
b. Explain the knowledge based system architecture in detail. [6 marks]
c. Discuss the at least four knowledge representation formalisms and their associated inference.

[10 marks]

QUESTION FOUR [20 MARKS]

a. A knowledge-based system (KBS) is a form of artificial intelligence (AI) that aims to capture the knowledge of human experts to support decision-making. Define the term Artificial Intelligence. [2 marks]
b. List four disadvantages of expert system. [4 marks]
c. List six abilities that are considered signs of intelligence. [6 marks]
d. Define the following terms
  i. Fuzzy Logic [2 marks]
  ii. Search [2 marks]
e. Give the rationality properties. [4 marks]

QUESTION FIVE [20 MARKS]

a. Explain the following and state when they are used
  i. Scripts [2 marks]
  ii. Lists [2 marks]
  iii. Decision tables [2 marks]
  iv. O-A-V triplet [2 marks]
b. For each of the following agents, develop a PEAS description of the task environment

  i. agent: automated taxi driver [6marks]
  ii. Agent: Part-picking robot [6 marks]