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(Knowledge for Development)

KIBABII UNIVERSITY

(KIBU)

**UNIVERSITY EXAMINATIONS
2020/20201 ACADEMIC YEAR**

**END OF SEMESTER EXAMINATIONS
YEAR FOUR SEMESTER II EXAMINATIONS**

**FOR THE DEGREE OF
BACHELOR OF SCIENCE**

IN

COMPUTER SCIENCE

COURSE CODE : CSC 467E

COURSE TITLE : KNOWLEDGE BASED SYSTEMS

DATE: 28/09/2021 TIME: 09.00 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? [2marks]
- 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 [12 marks]
 - i. agent: automated taxi driver
 - ii. Agent: Part-picking robot