(Knowledge for Development)

KIBABII UNIVERSITY

(KIBU)

UNIVERSITY EXAMINATIONS

2021/2022 ACADEMIC YEAR

SPECIAL/ SUPPLEMENTARY EXAMINATIONS

FOURTH YEAR SECOND SEMESTER

FOR THE DEGREE OF BACHELORS OF SCIENCE

(INFORMATION TECHNOLOGY)

COURSE CODE: BIT 425

COURSE TITLE: INTELLIGENT SYSTEMS

DATE: 18/11/2022 **TIME:** 11.00 A.M- .1.00 A.M

INSTRUCTIONS

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

QUESTION ONE (COMPULSORY) [30 MARKS]

a. Explain the role played by the following in the construction of an Intelligent Systems:

- **i.** Fuzzy Logics **[2 marks]**
- **ii.** Genetic algorithm **[2 marks]**

b. i. Most Companies and Organizations prefer the use of Expert Systems in their service delivery as opposed to Human Experts. What are the gains and loses behind this? **[6 marks]**

ii. If you were to develop an Expert System, explain the procedure you will follow, in each case identify the key Personnel involved. **[4 marks]**

iii. Using a suitable illustration, explain the key components of a rule based Expert System. **[6 marks]**

c. Explain various features that differentiate "an intelligent *Agent* "from "a robot". **[2 marks]**

d. Is it possible that the use of Intelligent System may overwhelm the use of Human Intelligence? Agree or disagree, justify. **[4 marks]**

e. Is "**Safaricom Zuri**" an Expert System or an Intelligent Agent? Discuss. **[4 marks]**

QUESTION TWO [20 MARKS]

a. Explain at least FIVE fields that have contributed and shaped Artificial Intelligence and Intelligent Systems. **[5 marks]**

b. Explain at least FIVE application areas of Artificial Intelligence. **[5 marks]**

c. Assume you are automating a Tax Driver Agent (TDA) to operate between Kanduyi and Malaba Border.

- **i.** Explain what will make this Agent Rational **[2 marks]**
- **ii.** Specify the Agents PEAS. **[6 marks]**
- **iii.** Generally, discuss the kinds and characteristics of the Environment the TDA will be operating in. **[4 marks]**

QUESTION THREE [20 MARKS]

a. For an intelligent system (example Expert system) to justify the course of its actions, it always engage in reasoning. Discuss the three common reasoning strategies used. **[6 marks]**

b. Explain what is practical reasoning is and describe the intentions in practical reasoning agent.

[4 marks]

c. Suppose you want to build a deliberate agent. Describe the two problems that you must address and give your opinion on the general progress on the solution to these problems. **[4 marks]**

d. Explain the meaning of the following concepts (and give an example in each case) in relation to Intelligent Systems:

i. Artificial Neural Network and Intention Systems **[3 marks]**

ii. Supervised and Supervised Learning **[3 marks]**

QUESTION FOUR [20 MARKS]

a. Differentiate between Fuzzy system and an Expert system. **[4 marks]**

b. Give a signature of production rules in logic form. **[4 marks]**

c. Using a well labeled diagram describe the various components of a fuzzy system. **[6 marks]**

d. Explain various real life application of fuzzy systems. **[6 marks]**

QUESTION FIVE [20 MARKS]

a. Discuss framework that one can use when developing the following:

i. Agents and Multi-Agents **[2 marks]**

ii. Expert system **[2 marks]**

b. Why most research is being carried on:

i. Natural language processing **[2 marks]**

ii. Ontologies **[2 marks]**

iii. Virtual Reality **[2 marks]**

iv. Robots **[2 marks]**

c. Write a simple prolog program to computer sum of numbers between 1-N, where N is a positive integer and is used as the celling in the query processing. Explain how you will compile this program or database of fact and simulated the output for sum where N=10. **[8 marks]**