CHUKA   **UNIVERSITY**

UNIVERSITY EXAMINATIONS

**FOURTH YEAR EXAMINATION FOR THE AWARD OF
BACHELOR OF SCIENCE COMPUTER SCIENCE**

COSC 442 DECISION SUPPORT SYSTEMS

STREAMS: BSC (COMP SCI.)   Y4S2   **TIME: 2 HOURS**

DAY/DATE: MONDAY 06/04/2020   **2.30 PM – 4.30 PM**

INSTRUCTIONS:

- Answer question **ONE** and **TWO** other questions
- Sketch maps and diagrams may be used whenever they help to illustrate your answer
- Do not write anything on the question paper
- This is a **closed book exam**, No reference materials are allowed in the examination room
- There will be **No** use of mobile phones or any other unauthorized materials
- Write your answers legibly and use your time wisely

QUESTION ONE COMPULSORY - (30 MARKS)

(a) Define the term "data mining".   [4 marks]

(b) Cite the purposes for which decision support systems may exist.   [4 marks]

(c) "Prototyping is the desired method for development of DSS". Comment.   [4 marks]

(d) Describe Knowledge management and its important in decision making. Give an example of how the two can be integrated.   [6 marks]

(e) Describe important steps that can occur during the process of building a decision support system.   [6 marks]

(f) Explain how neural networks relate to Decision Support Systems.   [6 marks]

SECTION B (40 MARKS) CHOOSE TWO QUESTIONS

QUESTION TWO (20 MARKS)

(a) Explain the relevance of data mining to Decision Support Systems. [6 marks]

(b) List and briefly describe the basic components of a DSS with a diagram. [6 marks]

(c) Explain the structure of an Expert System and explain the functionality of each module
[8 marks]

QUESTION THREE (20 MARKS)

(a) Explain the goal of data warehouse and describe the architecture of the same with the functionality of each component. [6 marks]

(b) Identify four knowledge base validation measures and techniques. [4 marks]

(c) With the aid of one or more diagrams, describe the general structure of an artificial neural network AND explain how it "learns" [10 marks]

QUESTION FOUR (20 MARKS)

(a) Regardless of the environment, a robust and well-defined DSS architecture should contain details about certain elements. Identify four factors that must be considered in designing DSS architecture. [4 marks]

(b) Explain how the following key areas determine the relative difficulty in decision making:
[6 marks]
(i)   Uncertainty.
(ii)   Structure.
(iii)   Cognitive limitations.

(a) Differentiate between the terms below, then show the order of evaluation of the following rule set;
(i) Forward chaining   (5 marks)
(ii) Backward chaining   (5 marks)

Rule 1 : IF a THEN success ELSE failure
Rule 2 : IF (b AND c) OR d THEN a
Rule 3 : IF e AND f THEN b
Rule 4 : IF g OR (h AND i) THEN c
Rule 5 : IF g AND h THEN d

Initial conditions: {e,f,h,i} TRUE, {g} FALSE

QUESTION FIVE (20 MARKS)

(a) Several factors associated with the design of the DSS can be directly related to the quality of user interface. Identify four interface issues that are extremely important if the DSS is to become a success. [4 marks]

(b) Identify the generalized framework for DSS success evaluation suggested by Klein and Methlie (1995) [4 marks]

(c) You are about to buy a car. Follow Simon's Four phase model and describe your activities in each step. [6 marks]

(d) Describe the activity-based typology of decisions. Give an example of each class. [6 marks]