



MACHAKOS UNIVERSITY

University Examinations for 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FOURTH YEAR SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)

BACHELOR OF SCIENCE (COMPUTER SCIENCE)

SCO 421/SIT 408: DECISION SUPPORT SYSTEMS

DATE: 26/9/2019

TIME: 11:00 – 1:00 PM

INSTRUCTIONS

- i) Answer question ONE and other TWO questions
- ii) Write on both sides of the answer sheet

QUESTION ONE (COMPULSORY) (30 MARKS)

- a) Define the following terms as applied in DSS
 - i) Risk (2 marks)
 - ii) Decision tree (2 marks)
 - iii) Sensitivity analysis (2 marks)
- b) What is the difference between data and knowledge (2 marks)
- c) Why do we use models in decision making? (4 marks)
- d) Describe the process of decision making (5 marks)
- e) What is a Simulator? (1 mark)
- f) What are the advantages of using simulation? (6 marks)
- g) Describe the general Structure of a Mathematical Model for Decision Support (6 marks)

QUESTION TWO (20 MARKS)

- a) What is a model (2 marks)
- b) Describe the components of a DSS (6 marks)
- c) Briefly describe FOUR tools used in data mining (6 marks)
- d) Explain the following terms:
 - i) Decision support systems (DSS) (2 marks)
 - ii) Automated decision systems (ADS) (2 marks)
 - iii) Business intelligence (BI) (2 marks)

QUESTION THREE (20 MARKS)

- a) Describe how to use the following in decision making:
- i) Expert system (3 marks)
 - ii) Goal-seeking (3 marks)
 - iii) What if Analysis (3 marks)
- b) Smith industries must decide whether to manufacture a new component at its factory or purchase the component from a supplier. If demand is high, it will be more profitable to manufacture the component in-house rather than purchase it. However the make-or-buy decision must be made before the demand level is known. The projected profits in thousand dollars is given below

	States of Nature(Chance Events)		
Alternatives	High Demand(H)	Medium Demand(M)	Low Demand(L)
Manufacture	100	40	-20
Purchase	120	90	30
Probabilities	0.2	0.3	0.4

- c) Construct a decision tree for this problem showing all your computations (8 marks)
- d) Suggest the best course of action and why (3 marks)

QUESTION FOUR (20 MARKS)

- a) Describe the ID3 Algorithm (5 marks)
- b) Use diagrams to describe the main database models (5 marks)
- c) Compare Blind search to Heuristic search (5 marks)
- d) What are the benefits of using models in decision making? (5 marks)

QUESTION FIVE (20 MARKS)

- a) Use a diagram to explain the phases in Knowledge Management System Cycle (5 marks)
- b) Why do we use Prototyping technique in Decision Support Systems (DSS)?(5 marks)
- c) What are the phases of decision making process (4 marks)
- d) Describe how to construct a decision tree (6 marks)