



MACHAKOS UNIVERSITY

University Examinations for 2020/2021 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (COMPUTER SCIENCE)

SCO 101: SYSTEM ANALYSIS AND DESIGN

DATE: 15/6/2021

TIME: 8.30-10.30 AM

INSTRUCTIONS

Answer question ONE and any other TWO questions.

QUESTION ONE (30 MARKS)

- a) Explain THREE elements of the information system structure. (6 marks)
- b) For an organization to develop a system, the idea has to be initiated from different sources. Discuss THREE reasons that may lead to development of information systems projects. (6 marks)
- c) Testing is a key stage in system development life cycle. Identify and explain the THREE levels of testing. (6 marks)
- d) With reference to their application, differentiate between waterfall model and incremental model. (4 marks)
- e) Outline THREE modelling techniques in which structured system analysis and design is applied. (3 marks)
- f) State the importance of documentation during system development life cycle (2 marks)
- g) Assuming you are involved in the project of developing an M-Pesa system. As an analyst, draw a context diagram to represent the process. (3 marks)

QUESTION TWO (20 MARKS)

- a) Explain when in the system development life cycle,
 - i. A feasibility study document would be produced. (2 marks)
 - ii. Discuss the contents of terms of reference (TOR) document. (5 marks)
- b) Distinguish between *functional* and *non-functional* requirements as used in System Analysis and Design. (4 marks)
- c) John had been assigned a task to develop information system for a certain organization within Nairobi. During requirement analysis stage, he realized the requirements were not well defined. Explain THREE strategies that you would propose to John to adopt in order to counter this challenge? (5 marks)
- d) Which approach would you recommend for developing a system for medical appointments? Justify your recommendation. (4 marks)

QUESTION THREE (20 MARKS)

- a) ABC company Ltd recently intends to install a system to automate its operations. During system design discuss the FOUR inputs and outputs that will be involved. (8 marks)
- b) Using entities *Student* and *Lecturer* show each of the following types of relationships between the two entities in entity relation diagrams. (4 marks)
 - i. One to many
 - ii. Many to many
- c) Explain THREE key responsibilities of the project committee in information system development project. (6 marks)
- d) Define the term *system coding* as used in System Analysis and Design. (2 marks)

QUESTION FOUR (20 MARKS)

- a) Outline FOUR advantages of using questionnaires as a fact-finding method (4 marks)
- b) Read the case below and use it to answer the question that follows: -
Infant passengers under two years old are offered a discount of 80% on domestic flights. Infant passengers under two years old are offered a discount of 70% on international flights. Youth passengers (between two and sixteen) are offered a discount of 10%, for any kind of destination. Passengers who make reservation five months before their journey are offered a

discount of 10%. For international flights, passengers are offered 15% discount if they travel during off-seasons. There would be no discount for international flights, except that when the passenger is an infant passenger or when travelling during off-season. Frequent flyer enjoys a discount of 15%. The amount of discount is accumulated. The maximum amount of discount for infant passengers is 80%. The maximum amount of discount for non-infant passengers is 20%.

Create a decision table for the case.

(8 marks)

- c) A computer science graduate has been offered two jobs A and B. Job A requires the graduate to spend Ksh. 70,000 in accommodation and travel while Job B requires Ksh. 30,000 per month. Monthly salaries of Ksh 180,000 and Ksh. 130,000 is attached to Jobs A and B respectively.

Using a decision tree, advise the graduate on the job offer to take.

(6 marks)

- d) Define the term *system design* as used in Information technology

(2 marks)

QUESTION FIVE (20 MARKS)

- a) Explain the term DFD and with the aid of a diagram and appropriate examples, describe the DFD symbols. (5 marks)
- b) As a system analyst you have been hired by a local bus garage repairs to develop a working system for the garage. To implement this, you would require to develop a DFD diagrams. With an appropriate diagram, demonstrate level 1 diagram (6 marks)
- c) Paul was required to carry out training of new users for a new information system in an organization
- State the most appropriate category of users that should be the last to be trained as per organizational structure (3 marks)
 - Explain THREE challenges that are likely to be experienced during the training of new users (6 marks)