



MACHAKOS UNIVERSITY

University Examinations for 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FOURTH YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (MATHEMATICS AND COMPUTER SCIENCE)

BACHELOR OF SCIENCE (MATHEMATICS)

SMA 490: SYSTEMS ANALYSIS AND DESIGN

DATE: 9/5/2019

TIME: 8.30-10.30 AM

INSTRUCTIONS

Answer **question ONE** and any other **TWO** questions.

QUESTION ONE (30 MARKS)

- a) Define the following terms:
 - i. System
 - ii. Analysis
 - iii. Design (3 marks)
- b) Describe any two categories of computer-based systems. (4 marks)
- c) Outline four characteristics of good system. (4 marks)
- d)
 - i Briefly explain four tasks that are performed during the systems analysis stage (8 marks)
 - ii Outline four skills that a systems analyst must possess. (4 marks)
- e) In as far as software development is concerned, differentiate between the following:
 - i. Scope vs environment
 - ii. Logical vs physical design
 - iii. Unit vs system testing (6 marks)

QUESTION TWO (20 MARKS)

- a) State what you understand by a software development methodology. (2 marks)

- b) Briefly describe following software development methodologies:
 - i. Structured methods:
 - ii. Information Engineering:
 - iii. Soft systems:
 - iv. Object oriented model: (8 marks)
- c) With suitable illustrations, describe four system conversion strategies. (10 marks)

QUESTION THREE (20 MARKS)

- a) Define the Software Development Lifecycle (SDLC). (2 marks)
- b) Briefly explain any five stages of the SDLC. (10 marks)
- c) With the use of appropriate diagrams, describe the following models used in SDLC, giving the strengths and weaknesses of each, as well as a suitable application area of each.
 - i. Waterfall or linear model
 - ii. Prototyping
 - iii. Evolutionary or spiral model
 - iv. The V- model (8 marks)

QUESTION FOUR (20 MARKS)

- a) State what you understand by process modeling. (2 marks)
- b) Describe the following process modelling techniques
 - i. Data Flow Diagrams (DFDs)
 - ii. Decision Trees
 - iii. Decision tables (6 marks)
- c) i Using suitable notations, provide the meaning of any three symbols used in DFDs. (6 marks)
- ii Draw a suitable DFD to depict the following case scenario:

When an invoice is received from a supplier, it is checked against a file of authorized purchases. If the invoice does not match an authorized purchase, then a querying letter is prepared and returned back with the invoice to the supplier. If the invoice reconciles, a payment authorization is made out. A cheque is then prepared and sent to the supplier, and the invoice and the authorization are filed. (6 marks)

QUESTION FIVE (20 MARKS)

Describe any four data collection tools, explaining the strengths, weaknesses and a suitable application area of each of the tools.