



MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

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: 21/10/2020

TIME: 2.00-4.00 PM

INSTRUCTIONS

Answer question ONE and any other TWO questions.

QUESTION ONE (30 MARKS)

- a)
 - (i) Define the term *system*. (2 marks)
 - (ii) Explain **two** characteristics of a closed system. (4 marks)
- b)
 - (i) Outline **two** soft skills necessary for a system analyst. (2 marks)
 - (ii) Distinguish between *probabilistic* and *deterministic* systems. (4 marks)
- c) A university has implemented a decision support system to assist in its operations. Explain **two** benefits of this system to students. (4 marks)
- d)
 - (i) Explain the term systems thinking as used in system analysis and design. (2 marks)
 - (ii) A newly established supermarket would like to carry out a feasibility study for a system. Explain **three** types of this study. (6 marks)
- e) Amani College has engaged you to lead a system development team. Explain **three** general principles of a system that you need to familiarize yourself with. (6 marks)

QUESTION TWO (20 MARKS)

- a)
 - (i) Outline **two** characteristics of a transaction processing system. (2 marks)
 - (ii) Distinguish between *telecommuting* and *teleconferencing* as used in system analysis and design. (4 marks)
- b) Mercy is been the team leader of a team that has been developing a system which has failed. Outline **four** reasons that could have led to this failure. (4 marks)

- c) Distinguish between *artificial intelligence* and *expert system*. (4 marks)
- d) Peter, a system analyst would like to implement a system that he has developed. Explain three changeover methods that he could use. (6 marks)

QUESTION THREE (20 MARKS)

- a) Describe **two** system stakeholders in a university management system. (2 marks)
- b) A Matatu SACCO intends to acquire a Transport Management Information System. Explain **two** methods the SACCO could use to achieve this goal. (4 marks)
- c)
 - (i) Explain the phrase *system development methodology*. (2 marks)
 - (ii) Describe two development methodologies used in system analysis and design. (4 marks)
- d)
 - (i) Outline **three** reasons that could lead to the development of a system. (3 marks)
 - (ii) A customer seeking to be connected to the national electricity grid fills a request form and submits it to the local office. A clerk in the office checks the form for completion and enters it in the company's database. A supervisor allocates a surveyor who surveys the area, prepares a report and submits the report to the office. A cashier computes the amount to be paid by the customer and sends the bill to the customer. Once the customer pays, the supervisor allocates a technician who connects the power. Model this scenario using *use case* diagram. (5 marks)

QUESTION FOUR (20 MARKS)

- a) Explain **two** types of data that could be used to test a system. (4 marks)
- b) A newly developed system has provided for a good output.
 - i. Outline **two** objectives of such output design. (2 marks)
 - ii. Describe **three** output modes that could have been incorporated in the system. (6 marks)
- c) Explain each of the following terms as used in object-oriented systems analysis and design.
 - i. Relation;
 - ii. Inheritance. (4 marks)
- d) A mobile lending application has class named LOAN and two subclasses PERSONAL and BUSINESS. LOAN has attributes *LoanID*, *LoanStatus* and *Period*, PERSONAL has attributes *PerID*, *PerName* and *Amount* while BUSINESS has attributes *BusID*, *BusName* and *Amount*. Represent this information in a class diagram. (4 marks)

QUESTION FIVE (20 MARKS)

- a) Explain the term *system documentation* as used in System Analysis and Design. (2 marks)
- b) Maji Company limited has been using a certain system to run its operations. The system analyst in the company has recommended that the system be maintained. Explain **three** types of maintenance that the company could use. (6 marks)
- c) A new University has acquired a student management information system. The system analyst has recommended training students on the use of the system. Explaining three methods of training that could be used. (6 marks)
- d) A technical support team has received printer conditions as follows: The printer prints, A red light is flashing and printer is recognized by the computer. The actions include Check the power cable, Check the printer-computer cable, Ensure printer software is installed, Check/replace ink and Check for paper jam.
Model this scenario using a decision table. (6 marks)