



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)

SMA 409: SYSTEMS ANALYSIS AND DESIGN

DATE:

TIME:

INSTRUCTIONS

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

QUESTION ONE (30 MARKS)

Case Study

The 'Sweet Treat' company is a small, independent business that sells sweets and cakes to the public. The proprietor is very keen on baking and specialises in making homemade sweets and cakes for sale in the shop. As well as making a lot of the confectionery sold in the shop, the proprietor also buys sweets and some cakes from suppliers to increase the range of products for sale.

The proprietor keeps records of the quantities of stock he has on hand. The stock includes raw ingredients for his baking, and also the sweets and cakes he buys from suppliers. Once a week the proprietor checks the stock to dispose of anything that is past its 'sell by' date. He also checks to see if any raw ingredients or any pre-made sweets and cakes need to be ordered from the suppliers. The proprietor orders supplies on a 'Cash on Delivery' basis, so all deliveries are paid for immediately they arrive.

At the end of each day the proprietor checks how many of each homemade item have been sold. He keeps a record of these sales, and uses this to decide how many of each cake or sweet to make for the following day.

- a) Produce a top level data flow diagram of the 'Sweet Treat' company. (10 marks)
- b) Compare Data Flow Models with Entity Relationship Diagrams. There is no need to produce a complete ERD but you may wish to illustrate your answer with examples. (10 marks)

- c) Two common techniques for gathering requirements are interviews and questionnaires. Choose one of these techniques and describe how an analyst would prepare for it and carry it out. (5 marks)
- d) For the technique you have chosen in part (c) discuss its advantages and disadvantages for requirements gathering. (5 marks)

QUESTION TWO (20 MARKS)

- a) Explain when in the system development life cycle a requirements document would be produced, and describe the contents of a requirements document. (5 marks)
- b) Differentiate between a functional and non-functional requirement. (2 marks)
- c) Identify three types of non-functional requirement. (3 marks)
- d) Explain what the following terms mean and where they apply in systems analysis and design (2 marks Each)
 - i. System
 - ii. Control
 - iii. Input/ Output
 - iv. Information systems
 - v. Central objective

QUESTION THREE (20 MARKS)

- a) Compare the life cycle of an agile method with the Waterfall life cycle. You should answer this question using an agile method of your choosing. (5 marks)
- b) Explain the meaning of the following terms (2 marks Each)
 - i. Motivational feasibility
 - ii. Organization
 - iii. Feedback
 - iv. Processor
 - v. Strategic information
- c) Discuss the disadvantages of developing a system using the Waterfall model approach. (6 marks)

QUESTION FOUR (20 MARKS)

- a) Explain how Agile development Methodologies address the disadvantages Waterfall development model (5 marks)
- b) Explain what is meant by a stakeholder (3 marks)
- c)
 - i Describe the role and responsibilities of the Business Analyst. (6 marks)
 - ii Identify the stages of the system development life cycle that a business analyst would typically be involved in. (6 marks)

QUESTION FIVE (20 MARKS)

- a) Identify two other types of stakeholder describing their roles and responsibilities. (6 marks)
- b) Explain what a prototype is and describe how it can be used in Requirements gathering. (4 marks)
- c) Outline the advantages and disadvantages of prototyping (2 marks)
- d) Describe the main steps in the prototyping cycle. (8 marks)