(University of Choice)

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

MAIN CAMPUS

UNIVERSITY MAIN EXAMINATIONS 2023/2024 ACADEMIC YEAR

SECOND YEAR 1ST SEMESTER EXAMINATIONS

BACHELOR OF SCIENCE IN COMPUTER SCIENCE, INFORMATION TECHNOLOGY, EDUCATION TECHNOLOGY, INFORMATION SYSTEMS & KNOWLEDGE MANAGEMENT

COURSE CODE: BCS 215/ BIT 211

COURSE TITLE: SYSTEM ANALYSIS AND DESIGN

DATE: Tuesday 5TH December 2023 **TIME:** 8:00AM – 10:00AM

INSTRUCTIONS TO CANDIDATES

Answer Question **ONE (1)** and Any **OTHER 2** questions
Ensure your answers/ideas are clearly expressed
All your answers must be clearly numbered
Write in ink. Rough work can be done in pencil and will not be marked. Cross out any rough work.
Calculators, phones, tablets, computers not allowed

TIME: 2 Hours 20 Minutes (20 minutes for reading and choosing questions)

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 3 Printed Pages. Please Turn Over. ▶

QUESTION ONE COMPULSORY QUESTION (30 MARKS)

a) Distinguish between the following systems development concepts [8 Marks]
   i) An Object and an Entity
   ii) Inheritance and Aggregation
   iii) Systems functional and non-functional requirements
   iv) DFD and an activity diagram

b) Data flow diagrams (DFD) are useful in modelling data movements in business processes during systems analysis and design. Using suitable diagrams, describe the function of any FOUR of the objects used in DFDs [8 Marks]

c) In systems development, the analyst will need to gather information about the current system. As a systems analyst, briefly describe the data collection approaches familiar to you that you may employ in gathering information from end users [5 Marks]

d) Mama Watoto Supermarket is facing aggressive competition form new entrants into the Kakamega FMCG market. Consequently, they are considering exploring new opportunities in going online but are not sure what to expect. As an IT consultant, You have been contracted to advice [9 Marks]

QUESTION TWO (20 MARKS)

One common experience that students in every college and university share is enrolling in a college course.

a) Distinguish between DFD and ERD [3 Marks]

b) Outline the acclivities involved in the registration process [6 Marks]

c) Using an activity diagram in a Swimlane, illustrate the model of registration [8 Marks]

d) Draw an ERD to illustrate the different relationships between students, schools and degree programs [3 Marks]

QUESTION THREE (20 MARKS)

Both systems development and software engineering share modelling tools that makes them to appear synonymous

a) Systems analysts must consider the interests of various users. Briefly describe the different types of users and their roles in an information system [4 Marks]

b) Write short notes on the following systems development methodologies [9 Marks]
   i) Structured Systems Analysis and Design
   ii) Agile methodology
   iii) Prototyping

c) The purpose of the class diagram is to show the static structure of the system being modelled. Using a class diagram illustrate the concept of inheritance in model academic programs [7 Marks]

QUESTION FOUR (20 MARKS)

Use case diagram is a behavioral UML diagram type and frequently used to analyze various systems that enable you to visualize the different types of roles in a system and how those roles interact with the system.

a) briefly describe how the four Notations in a Use-case model are used [8 Marks]

b) Outline the systematic process of ordering and taking delivery of items online using an ecommerce facility such as Amazon or Jumia [6 Marks]

c) Using use-case model notations, represent the process outlined above [6 Marks]

QUESTION FIVE **(20 MARKS)**

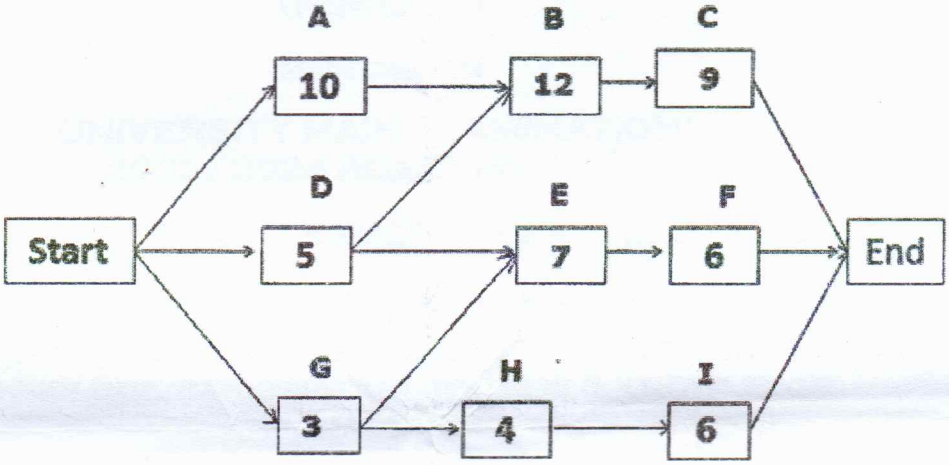
Estimating the time a project will take is a critical factor in controlling systems development projects. Some of the tools available for a project manager include PERT, CPM and Gantt charts.

a) Distinguish between the following project management concepts

i) Milestones and critical activities [3 Marks]

ii) Project Outputs and Outcomes [3 Marks]

b) Consider the activities in the diagram below:



i) Identify the alternative paths from start to the end of the project [5 Marks]

ii) What is the total time required to complete the project if no delays occur? [3 Marks]

iii) Which are the critical activities where any delays must be avoided to prevent delaying project completion? [3 Marks]

iv) What path has the shortest completion time [3 Marks]