



MAASAI MARA UNIVERSITY

UNIVERSITY EXAMINATIONS 2021/2022 (REGULAR)

**SCHOOL OF PURE, APPLIED AND HEALTH SCIENCES
DEGREE OF BACHELOR OF SCIENCE (COMPUTER SCIENCE)**

THIRD YEAR FIRST SEMESTER EXAMINATION

COURSE CODE: COM 3104

COURSE TITLE: SOFTWARE ENGINEERING

DATE: 4th April 2022 TIME: 2:30 PM -4:30 PM

INSTRUCTIONS TO CANDIDATES

- **Question ONE in Section "A " is Compulsory**
- **Answer any Two (2) Questions from Section "B"**
- **Illustrate your answers where necessary**

SECTION A

QUESTION ONE (COMPULSORY 30 MARKS)

1. Write a short set of guidelines for designers of user guidance systems **(4 Marks)**
2. Suggest four reasons why dependability is important in critical systems **(4 Marks)**
3. Give three reasons why algorithmic cost estimates prepared in different organizations are not directly comparable**(3 Marks)**
4. Briefly describe three techniques of defensive programming that may be used to reduce the probability that a software faults leads to a system error **(3 Marks)**
5. What is the critical distinction between a milestone and a deliverable**(2 Marks)**
6. Suggest how fault-tree analysis could be modified for use in security specification **(5 Marks)**
7. Using E-CITIZEN government portal as an information system provide various system components of the same **(4 Marks)**
8. The figure below gives task durations for software project activities. Assume that a serious unanticipated setback occurs and instead of taking 10 days,Task T5 takes 40 days. Revise the activity network accordingly, highlighting the new critical path **(5 Marks)**

TASK	DURATION (Days)	DEPENDENCIES
T1	10	
T2	15	T1
T3	10	T1,T2
T4	20	
T5	10	
T6	15	T3,T4

T7	20	T3
T8	35	T7
T9	15	T6
T10	5	T5,T9
T11	10	T9
T12	10	T10
T13	35	T3,T4
T14	10	T8,T9
T15	20	T12,T14
T16	10	T15

SECTION B

QUESTION TWO (20 marks)

1. List and explain any five agile principles of software development **(10 Marks)**
2. Provide an illustration of the procurement process of the off-the-shelf system **(4 Marks)**.
3. Describe three types of software process metric that may be collected as part of a process improvement process, providing an example for each type of metric **(6 Marks)**

QUESTION THREE (20 marks)

1. Using a diagram, Provide an illustration of the procurement process of a bespoke software system **(4 Marks)**
2. Identify possible objects **(3 Marks)**, sub-systems **(3 Marks)** and sequence of operations **(4 Marks)** in the following systems You may

make any reasonable assumptions about the systems when deriving the design **(10 Marks)**.

A group diary and time management system is intended to support the timetabling of meetings and appointments across a group of co-workers. When an appointment is to be made which involves a number of people, the system finds a common slot in each of their diaries and arranges the appointment for that time. If no common slots are available, it interacts with the users to rearrange their personal diaries to make a room for the appointment.

3. Computer science 3.2 students came up with a new library management system for the school. The system is however characterized by frequent downtimes and inconsistencies as it is required to integrate with other school systems. Suggest and explain three ways to correct the issues mentioned **(6 Marks)**.

QUESTION FOUR (20 marks)

1. A software development architect at Maasai Mara University was required to make use of a fourth generation language for database programming. List and provide a description of the four tools used in the fourth generation language **(8 Marks)**.
2. Computer science students were required to carry out a risk assessment of the school portal as part of risk management.
 - a. Mention any standards that they could use as a guide to risk management **(2 Marks)**.
 - b. List and describe the three processes in the risk assessment stage of risk management **(6 Marks)**.
 - c. Provide a brief description of any four strategies of risk treatment after risk assessment **(4 Marks)**.