



# **MAASAI MARA UNIVERSITY**

**REGULAR UNIVERSITY EXAMINATIONS**

**2019/2020 ACADEMIC YEAR**

**SCHOOL OF SCIENCE AND INFORMATION  
SCIENCES**

**BACHELOR OF SCIENCE  
(COMPUTER SCIENCE)**

**COURSE CODE: COM 3104**

**COURSE TITLE: SOFTWARE ENGINEERING**

**DATE: DECEMBER 4<sup>TH</sup>, 2019**

**TIME: 8:30- 10.30 A.M**

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## **INSTRUCTIONS**

- Answer Question ONE and any other TWO Questions From Section II
- Question 1 is compulsory.
- Time 2HRS.

## SECTION 1

Question 1, compulsory (30 marks)

- (a) What are the four important attributes that all professional software should have? Suggest four other attributes that may sometimes be significant. **(4 marks)**
- (b) Based on your own knowledge of some of the application types discussed in this course, explain, with examples, why different application types require specialized software engineering techniques to support their design and development. **(6 marks)**
- (c) Discover four ambiguities or omissions in the following statement of requirements for part of a ticket-issuing system **(8 marks)**
- (e) When describing a system, explain why you may have to design the system architecture before the requirements specification is complete. **(4 marks).**
- (f) Explain why software testing can only detect the presence of errors, not their absence. **(4 marks)**
- (g) Explain why a software system that is used in a real-world environment must change or become progressively less useful. **(4 marks)**

## SECTION II

Question 2, optional (20 marks)

- a) Giving reasons for your answer based on the type of system being developed, suggest the most appropriate generic software process model that might be used as a basis for managing the development of the following systems: **(12 marks)**
  - 1. A system to control anti-lock braking in a car
  - 2. A virtual reality system to support software maintenance
  - 3. A university accounting system that replaces an existing system
  - 4. An interactive travel planning system that helps users plan journeys with the lowest environmental impact

- (b) Suggest why it is important to make a distinction between developing the user requirements and developing system requirements in the requirements engineering process. **(8 marks)**

Question 3, optional (20 marks)

- (a) Explain how the principles underlying agile methods lead to the accelerated development and deployment of software. **(12 marks)**
- (b) Extreme programming expresses user requirements as stories, with each story written on a card. Discuss the advantages and disadvantages of this approach to requirements description. **(8 marks)**

Question 4, optional (20 marks)

- (a) How might you use a model of a system that already exists? Explain why it is not always necessary for such a system model to be complete and correct. Would the same be true if you were developing a model of a new system? **(10 marks)**
- (b) Using the UML graphical notation for object classes, design the following object classes, identifying attributes and operations. Use your own experience to decide on the attributes and operations that should be associated with these objects. **(10 marks)**
1. A messaging system on a mobile (cell) phone or tablet
  2. A printer for a personal computer
  3. A personal music system
  4. A bank account
  5. A library catalogue

**//END**