



MACHAKOS UNIVERSITY

University Examinations for 2020/2021

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

SECOND YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF (SCIENCE IN INFORMATION TECHNOLOGY)

SIT 263: SOFTWARE ENGINEERING

DATE: 12/8/2021

TIME: 8:30 – 10:30 AM

INSTRUCTIONS

- i) Answer question ONE and any other TWO questions**
- ii) Write on both sides of the answer sheet**
- iii) Do not write in the margins of the answer booklet**

QUESTION ONE (COMPULSORY) (30 MARKS)

- a) What do the following abbreviations stand for? Write in full
 - i) GUI (1 mark)
 - ii) CASE (1 mark)
 - iii) UML (1 mark)
- b) Define the following terms
 - i) Software process (1 mark)
 - ii) System decommissioning (1 mark)
 - iii) Legacy system (1 mark)
- c) For each of the following requirements, indicate whether functional or non-functional (5 marks)
 - i) The system shall respond to all requests within 5 seconds.
 - ii) Users shall be able to post one .jpg file containing a picture of their merchandise.
 - iii) The system shall properly secure all sensitive user information.
 - iv) The system shall support 500 simultaneous users.
 - v) The system shall respond to a core temperature above threshold event within 10s
- d) Distinguish between the following
 - i) Systems engineering and software engineering (2 marks)
 - ii) Bespoke and Generic Software products (2 marks)

- e) Give TWO examples for each of the following
 - i) Generic software (2 marks)
 - ii) C.A.S.E. Tools (2 marks)
- f) Describe any THREE Generic activities in all software processes (6 marks)
- g) Explain the challenges faced by engineers when decommissioning a system. (5 marks)

QUESTION TWO (20 MARKS)

- a) Name any FIVE Diagrams used in UML (5 marks)
 - b) Use a diagram in each case to explain any THREE UML Diagrams (6 marks)
 - c) Draw an entity model (class diagram) for the following scenario. (9 marks)
- The following scenario is for a pet store. Each pet store has up to 20 furry friends and 10 birds. Each pet has a vaccination history. Furry friends are either dogs or cats. Each furry friend has a microchip implant for identification. Each microchip has a unique id number.

QUESTION THREE (20 MARKS)

- a) Define the following
 - i) System (2 marks)
 - ii) Prototype (2 marks)
 - iii) Data-flow Diagram (2 marks)
- b) Describe briefly the following functional system components
 - i) Sensor components (2 marks)
 - ii) Actuator components (2 marks)
 - iii) Computation components (2 marks)
 - iv) Interface components (2 marks)
- c) Draw a diagram and use it to explain component types in a fire-alarm system. (6 marks)

QUESTION FOUR (20 MARKS)

- a) Name TWO Types of software prototypes (2 marks)
- b) Explain briefly FOUR benefits of software prototyping (4 marks)
- c) Describe briefly any FOUR GUI components/characteristics (8 marks)
- d) Consider a program which registers students for different programs. The students fill a form and submit it. This is sent to the departments for confirmation. Once it is confirmed, the form and the fees is sent to the account section. Draw a data flow diagram for this program. (6 marks)

QUESTION FIVE (20 MARKS)

- a) Using diagrams explain the following Software process models
 - i) Waterfall model (5 marks)
 - ii) Spiral Model (5 marks)
- b) Compare Software engineering with other engineering disciplines (5 marks)
- c) Describe FIVE main principles of UI Design (5 marks)