MACHAKOS UNIVERSITY

University Examinations for 2022/2023

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

SECOND YEAR SPECIAL / SUPPLEMENTARY EXAMINATIONS FOR

BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)

SIT 263: SOFTWARE ENGINEERING

DATE: 28/7/2023 **TIME: 2:00 – 4:00 PM**

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 (30 MARKS, COMPULSORY)

a) Explain the meaning of the following terms

i) Software process (2 marks)

ii) System decommissioning (2 marks)

iii) Legacy system (2 marks)

b) 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

c) Distinguish between the following

i) Systems engineering and software engineering (2 marks)

ii) Bespoke and Generic Software products (2 marks)

d) Give TWO examples for each of the following

i) Generic software (2 marks)

ii) C.A.S.E. Tools (2 marks)

e) Describe any THREE Generic activities in all software processes (6 marks)

f) Name any FIVE Diagrams used in UML (5 marks)

QUESTION TWO (20 MARKS)

a) Explain the challenges faced by engineers when decommissioning a system (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) Explain Data-flow Diagram using a simple example (2 marks)

b) Using example explain the following functional system components as applied in software engineering

i) Sensor components (3 marks)

ii) Actuator components (3 marks)

iii) Computation components (3 marks)

iv) Interface components (3 marks)

c) Draw a diagram and use it to explain component types in a fire-alarm system (6 marks)

QUESTION FOUR (20 MARKS)

a) Explain the benefits of software prototyping (6 marks)

b) Describe briefly any FOUR GUI components/characteristics (8 marks)

c) 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)