



MACHAKOS UNIVERSITY

University Examinations for 2021/2022

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

SECOND YEAR SECOND SEMESTER EXAMINATIONS FOR

BACHELOR OF SCIENCE (MATHEMATICS AND COMPUTER SCIENCE)

BACHELOR OF SCIENCE (COMPUTER SCIENCE)

SCO 203: SOFTWARE TESTING

DATE: 10/12/2021

TIME: 2.00-4.00 PM

INSTRUCTIONS:

1. Answer **Question 1** and **Any Other Two** questions.
2. Mobile phones are not allowed in the examination room.
3. You are not allowed to write on this examination question paper

QUESTION ONE (COMPULSORY 30 MARKS)

- a) Distinguish between (6 marks)
 - i. fault and failure.
 - ii. Software quality control and quality assurance
 - iii. Software verification and Software validation
- b) Describe the steps involved during the inspection process (6 marks)
- c) A program reads an integer number within the range [1, 100] and determines whether it is a prime number or not. Design the test cases for this program using boundary value analysis (6 marks)
- d) Explain the following types of metrics giving examples in each case (6 marks)
 - i. Internal metrics
 - ii. Hybrid metrics
 - iii. Project metrics
- e) Explain the steps in the configuration of a software product. (6 marks)

QUESTION TWO (20 MARKS)

- a) The SQA architecture consists of important components in order to ensure quality in software development. Describe two of the components by referring to their importance and evolution in software industry. (8 marks)
- b) Explain how the following factors contribute to software defects:
- i. Poor design logic (2 marks)
 - ii. Poor coding practices (2 marks)
 - iii. Lack of version control (2 marks)
 - iv. Buggy third party tools (2 marks)
- c) You have designed test cases to provide 100% statement and 100% decision coverage for the following fragment of code.
- ```
if width > length then biggest_dimension = width else biggest_dimension = length end_if
```
- Explain the number of more test cases still required if the following has been added to the bottom of the code fragment above. (4 marks)
- ```
print "Biggest dimension is " & biggest_dimension  
print "Width: " & width print "Length: " & length
```

QUESTION THREE (20 MARKS)

- a) McCall's factor model classifies all software requirements into 11 software quality factors. The eleven factors are re-grouped into three categories
- i. Identify the three categories (3 marks)
 - ii. List at least one software requirement in each category (3 marks)
- b) There are typical controlled documents which are vital for the development and maintenance of software systems as well as for the management of current and future relationships with the customer. As a team leader, explain the strategies and tools you will use to ensure that the documents are written and stored as required. (8 marks)
- c) Explain the importance of ISO/IEC 9241-11 standard in system testing. (2 marks)
- d) Consider the following techniques. Indicate the static and dynamic techniques (4 marks)
- i. Equivalence Partitioning.
 - ii. Use Case Testing.

- iii. Exploratory Testing.
- iv. Decision Testing.

QUESTION FOUR (20 MARKS)

- a) Describe what is involved in the following software configuration management processes:
 - i. Baselines (2 marks)
 - ii. Change control (2 marks)
 - iii. Configuration audit and reviews (2 marks)
- b) A student in Machakos University mentioned about the “outdated mindset”. Critically assess the model the student wishes for, with reference to quality in the software development. (8 marks)
- c) Explain the following software testing trends:
 - i. Big data testing (2 marks)
 - ii. IOT testing (2 marks)
 - iii. Test automation (2 marks)

QUESTION FIVE (20 MARKS)

- a) Draw the program flow graph of the module below. (6 marks)
ITS taxi fares for one-time passengers are calculated as follows:
 - 1. Minimal fare: \$2. This fare covers the distance traveled up to 1000 yards and waiting time (stopping for traffic lights or traffic jams, etc.) of up to 3 minutes.
 - 2. For every additional 250 yards or part of it: 25 cents.
 - 3. For every additional 2 minutes of stopping or waiting or part thereof: 20 cents.
 - 4. One suitcase: 0 charge; each additional suitcase: \$1.
 - 5. Night supplement: 25%, effective for journeys between 21.00 and 06.00. Regular clients are entitled to a 10% discount and are not charged the night supplement.
- b) Explain Three management responsibilities in SQA according to Galin (6 marks)
- c) Explain different size metrics in software measurements (8 marks)