INTERNATIONAL UNIVERSITY OF EAST AFRICA
'Learning to Succeed'

FACULTY OF SCIENCE AND TECHNOLOGY

END OF SEMESTER EXAMINATIONS - DECEMBER 2025

PROGRAMME: BSSE
YEAR/SEM: YEAR 4/SEMESTER 1
COURSE CODE: SWE4102
NAME: SOFTWARE QUALITY ASSURANCE AND TESTING TOOLS

DATE:
TIME:

INSTRUCTIONS TO CANDIDATES:

SECTION A

Write short and precise answers – Answer all Questions

Question 1:

a) Differentiate between software testing and software debugging. [4 Marks]

b) List the importance of software testing. [4 Marks]

c) Define software test automation. [4 Marks]

d) Test Automation is the best way to increase the effectiveness, test coverage, and execution speed in software testing. List the importance's of automated software testing. [4 Marks]

e) Differentiate between generator and recognizer as used in software testing. [4 Marks]

f) Briefly explain the benefit of test independence. [4 Marks]

g) Given the following fragment of code, List the tests required for 100% decision coverage? [4 Marks]

```
if width > length
   then biggest_dimension = width
     if height > width
              then biggest_dimension = height
     end_if
else biggest_dimension = length
            if height > length
                then biggest_dimension = height
          end_if
end_if
```

h) Briefly explain the different Methodologies in Agile Development Model. [4 Marks]

i) List the valid objectives for incident reports. [4 Marks]

j) Briefly explain the test activity where faults would be found most cost effectively. [4 Marks]

Question 2:

a) List the test Cases that are automated. [4 Marks]

b) List the category of test cases which are not suitable for automation. [4 Marks]

c) List the steps that are followed in an Automation Process. [4 Marks]

d) Briefly explain the terms below as used in software testing.

i. Software Failure. [2 Marks]

ii. Software Error. [2 Marks]

e) Differentiate between software validation and software verification. [4 Marks]

f) Briefly explain why we split testing into distinct stages. [4 Marks]

g) What is Fault Masking? [4 Marks]

h) What are the two parameters which can be useful to know the quality of test execution. [4 Marks]

i) Briefly explain the categories of debugging. [4 Marks]

j) Briefly explain the information that should be covered in Test Plan. [4 Marks]

SECTION B

Long Essay - Answer any 3 Questions

Question 1:

a) Why should test Engineers use test plans? **[4 Marks]**

b) Distinguish between regression testing and test plan. **[8 Marks]**

c) Explain the testing goals based on test process maturity. **[8 Marks]**

Question 2:

a) Explain the three conditions necessary for a failure to be observed. **[4 Marks]**

b) Explain the role of Test Engineer in software testing. **[8 Marks]**

c) Explain the role of Test Manager in software testing. **[8 Marks]**

Question 3:

Explain the importance's of software testing. **[20 Marks]**

Question 4:

a) Briefly explain how the modified condition or decision coverage is achieved in the process of software testing. **[10 Marks]**

b) Combinatorial/Multiple Condition Coverage requires each possible combination of clauses to be tested. Draw a truth table for the given condition. **[10 Marks]**

```
(a > 0) && foo(b) || c
```

Question 5:

a) As a software test Engineer explain the code segment below. **[10 Marks]**

```
x = 0;
while (x < y) {
y = f (x, y);
if (y == 0) {
break;
}
else if (y < 0) {
y = y*2;
continue;
}
x = x + 1;
}
print (y);
```

b) Draw a control flow graphs for the above code segment. **[10 Marks]**

Question 6:

a) List the advantages of Coverage Criteria. **[10 Marks]**

b) Explain test criterion as applied in software testing. **[10 Marks]**

Question 7:

a) Explain test design as applied in software testing. **[4 Marks]**

b) Explain the steps required to improve testing. **[8 Marks]**

c) Explain the types of test activities as applied in software testing. **[8 Marks]**

Question 8:

a) What is JUnit? **[2 Marks]**

b) Briefly explain the following.

i. Black-box testing. **[6 Marks]**

ii. White-box testing. [6 Marks]

iii. Model-based testing. **[6 Marks]**

Question 9:

a) Explain the common risk that leads to the project failure? **[10 Marks]**

b) Explain what is testing type and what are the commonly used testing type? **[10 Marks]**

Question 10:

a) Explain how to prepare a test strategy. **[10 Marks]**

b) Explain how to prepare a test plan. **[10 Marks]**

Question 11:

a) Briefly explain how to carry out walkthroughs, inspections, and reviews in the software testing process. **[10 Marks]**

b) Briefly explain how to perform the static analysis in software testing process. **[10 Marks]**

Question 12:

a) Briefly explain how to Specify the software requirements in software testing. **[10 Marks]**

b) Briefly explain how to Describe the formal specification techniques in software testing. **[10 Marks]**