KENYATTA UNIVERSITY

EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN COMPUTER SCIENCE/MATHEMATICS

SCO 203: SOFTWARE TESTING & QUALITY ASSURANCE

CAT II

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a. Differentiate between

i. Test case specification and test design specification. (2 marks)

- Test case- this is a document that describes the individual tests that will be executed.During test it includes test steps, expected results pass/fail criteria.
- Test design- is a document that describes the strategy for designing cases

ii. Exhaustive and Effective testing (2 marks)

- Exhaustive testing is a theoretical concept that involves testing all possible combinations of inputs
- Effective testing is a practical approach of testing most important and likely inputs.

iii. Software Quality Assurance and Software Quality (2 marks)

- Software quality assurance is a process of ensuring that software meets the specified requirements
- Software quality is a measure of how well software meets the specified requirements

b. Explain three key benefit of test independence? (3 marks)

Reduced bias: Testers who are independent of the development team are less likely to be biased towards the software.

Improved defect detection: Independent testers are more likely to find defects that the development team has missed.

Increased credibility: Test results from an independent team are more credible to stakeholders.

b. Describe two functional and two non-functional requirements for a hospital application (4 marks)

Functional requirements

Patient registration: The application should allow users to register new patients.
Appointment scheduling: The application should allow users to schedule appointments.

Non-functional requirements

Security: The application should be secure and protect patient data.
Performance: The application should be perform and respond to user input quickly.

d. Explain three role of quality assurance in software testing process (3 marks)

Defect/bugs identification and reporting: The SQA team is responsible for identifying and reporting defects.
Planning and monitoring: The SQA team is involved in planning the testing process and monitoring its progress.
Review and approval: The SQA team reviews test cases and approves them for execution.

e. With reference to software testing discus five types of bugs and their possible causes (5 marks)

- Functional bugs- the cause the software to behave incorrectly compared to its intended functionality

caused by codding errors like typos, Misunderstanding functionality

- Logical bugs- these are bugs stem from flaws in the software flow or decision making process.

  Caused by incorrect algorithms,faulty conditional statements, off by one errors

- Data bugs- they occur due to issues with how data is handled or stored.
  Caused by Data type mismatches, data corruption
- Security Bugs-these bugs leave the software vulnerable to attacks or unauthorized access.
  Caused by input validation flaws,buffer overflows,weak encryption
- Compatibility Bugs- these bugs arise when software does not work as expected on different operating systems
  caused by lack of proper testing across different environment,assumptions about specific hardware or software versions that turn to be incorrect

f. As a Quality Assurance manager of Mitec company discus five relevant SQA measures you would deploy to avert a tragedy. (5 marks)

Static Code Analysis and Code Reviews. Integrate static code analysis tools to detect potential defects early in the development phase.

Defect Management and Tracking-Establish a rigorous defect management process. Ensure all identified defects are documented, prioritized, tracked through resolution, and verified as fixed. This ensures critical issues are addressed promptly and don't linger to cause problems later

Robust Test Case Design:

Design test cases that go beyond typical use cases. Include scenarios that explore edge cases, error handling, and failure conditions.

Thorough Requirements Review:

Involve the SQA team early in the Software Development Life Cycle (SDLC) to meticulously review and ensure clarity in functional and non-functional requirements.

Implement Independent Testing:

Enforce independent testing by a team separate from developers. This reduces bias and increases the chance of catching critical defects the development team might miss

g. Describe four main activities of formal technical reviews in SQA (4 marks)

Follow-up: The review team follows up on the findings of the review to ensure that they are addressed.

Conduct the review: The review team meets to discuss the software product.

Planning and preparation: The SQA team plans the review and prepares the review materials.

Recording and reporting: The review team records the findings of the review and reports them to stakeholders.