GRETSA UNIVERSITY - THIKA

UNIVERSITY EXAMINATIONS

JANUARY-APRIL 2025 SEMESTER

DIPLOMA IN IT/COMPUTER SCIENCE

COURSE CODE: DISD 031

COURSE TITLE: INTRODUCTION TO SOFTWARE QUALITY ASSURANCE

DATE: APRIL 2025 **TIME: 2 HOURS**

INSTRUCTIONS TO CANDIDATES

1. SECTION A IS **COMPULSORY.**
2. SECTION B: ANSWER ANY OTHER **TWO** QUESTIONS.
3. **DO NOT** WRITE ANYTHING ON THIS QUESTION PAPER AS IT WILL BE AN EXAM IRREGULARITY.
4. ALL ROUGH WORK SHOULD BE AT THE BACK OF YOUR ANSWER BOOKLET AND CROSSED OUT.

CAUTION: *All exam rooms are under CCTV surveillance during the examination period.*

SECTION A: COMPULSORY

Question One

a) A software company is transitioning from Waterfall to Agile development. The SQA team is tasked with maintaining quality during the transition. Discuss:
   i. The challenges the SQA team might face. [4 marks]
   ii. How continuous testing and collaboration between testers and developers can address these challenges. [2 marks]

b) Define software quality assurance (SQA) and explain its importance in the software development life cycle (SDLC). [4 marks]

c) Differentiate between product quality and process quality with examples. [4 marks]

d) Evaluate the role of test plans and strategies in software testing. [4 marks]

e) List and explain two benefits and two challenges of automated testing. [4 marks]

f) Consider the following code review checklist. Explain how a code review ensures quality by addressing the checklist items
   i. Proper variable naming conventions [2 marks]
   ii. Use of comments for code clarity [2 marks]
   iii. Error handling mechanisms [2 marks]
   iv. Security vulnerabilities [2 marks]

SECTION B: ANSWER ANY TWO QUESTIONS

Question Two

a) Discuss the key phases of the SDLC, and discuss how SQA is integrated into each phase. [12 marks]

b) During the design phase of a software project, the development team overlooks key requirements, resulting in defects being detected late in the SDLC. The SQA team is called in to address the issue.
   i. What challenges arise from detecting defects late in the development process? [4 marks]
   ii. How can early involvement of SQA in requirements analysis and design reviews mitigate these challenges? [4 marks]

Question Three

a) A software company is struggling with frequent customer complaints about software defects. How can applying ISO 9000 principles help improve their software quality? [8 marks]

b) Static testing does not require code execution.

i. Explain why this is beneficial in identifying software defects. [4 marks]

ii. Distinguish between code reviews and walkthroughs and methods of static testing [4 marks]

iii. Discuss the benefits of implementing inspection as a type of static testing [4 marks]

Question Four

a) Explain the differences between black-box testing and white-box testing, providing an example for each. [6 marks]

b) Explain the purpose of white-box testing and discuss two common techniques used in this approach. [5 marks]

c) A tester is performing security testing on a web application with partial knowledge of the system architecture and database. Identify the type of testing being used and justify your answer. [5 marks]

d) Discuss why usability testing is crucial in ensuring user satisfaction in software products. [4 marks]

Question Five

a) Discuss three common risks in software projects and suggest ways to mitigate them. [6 marks]

b) A software development team identifies that a critical project dependency may not be delivered on time. Outline the steps they should take to mitigate this risk. [6 marks]

c) Explain the difference between proactive risk management and reactive risk management in software development. [4 marks]

d) Identify the role of a Risk Management Plan in ensuring software quality. [4 marks]