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**KIRIRI WOMEN'S UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**UNIVERSITY EXAMINATION, 2023/2024 ACADEMIC YEAR**  
**END SEMESTER EXAMINATION**  
**FOR THE BACHELOR OF SCIENCE IN COMPUTER SCIENCE**  
**KCS 405 – ADVANCED SOFTWARE ENGINEERING**

Date: 14<sup>TH</sup> APRIL 2023  
Time: 8:30AM – 10:30AM

**INSTRUCTIONS TO CANDIDATES**

**ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS**

**QUESTION ONE (30 MARKS)**

- a) Explain the concept of software engineering (3 Marks)
- b) Define the following acronyms and terms as used in software engineering
  - i) SRS (1 mark)
  - ii) Function points (1 mark)
  - iii) TQM (1 mark)
  - iv) Case tools (1 Mark)
  - v) PTCE (2 Marks)
- c) Distinguish between software verification and validation. [3Marks]
- d) Under what circumstances would you use the following SDLC models:
  - i) Waterfall model (2 Marks)
  - ii) Iterative model (2 Marks)
  - iii) Spiral model (2 Marks)
  - iv) V model (2 Marks)
  - v) Big bang model (2 Marks)
  - vi) Agile model (2 Marks)
- e) Highlight four essential attribute of good software (2 Marks)
- f) List four reason why an organization may decide to buy ready-made software instead of developing a new one. (2 Marks)
- g) What does the concept of zero-defect mean? (2 Marks)

**QUESTION TWO (20 MARKS)**

- a) Discuss distinct steps in requirements engineering process (5 Marks)
- b) Briefly explain the different levels of testing. State the reason why software testing Principle is important. (5 Marks)
- c) Explain the taxonomy of CASE tools (4 Marks)
- d) Briefly discuss the following software engineering design concepts;
  - i) Modular design (3 Marks)
  - ii) Architectural design (3 Marks)

**QUESTION THREE (20 MARKS)**

- a) Describe the limitations facing software companies in software development leading to a large backlog of unfinished projects which have stalled for many years (6 Marks)
- b) Software cost and effort estimation will never be an exact science. Too many variables-human technical, environmental, political-can affect the ultimate cost of software and effort applied to develop it. "Do you support this statement? Justify your answer with a suitable examples (4 Marks)
- c) Explain the factors that affect software productivity (4 Marks)
- d) Software reuse is an important technique of software cost reduction and productivity improvement Required: What are the major technical and non-technical factors that hinder software reuse? (4 Marks)
- e) Distinguish between white-box and black-box software testing techniques (2 Marks)

**QUESTION FOUR (20 MARKS)**

- a) Differentiate between the software metrics and measure. Explain the need for software measures and describe various metrics. (10 Marks)
- b) i. Software maintenance cost is higher than it does to develop, justify (2 Marks)  
ii. Discuss software maintenance activities and explain the re-engineering (8 Marks)

**QUESTION FIVE (20 MARKS)**

- a) Define the term software process or Software Development Life Cycle (SDLC)? (2 Marks)
- b) Outline any four major activities involved in Software Development Life Cycle Model.(2 Marks)
- c) Briefly Discuss the following software engineering paradigms
  - i) Prototyping (4 Marks)
  - ii) Waterfall (4 Marks)
  - iii) Spiral Model (4 Marks)
  - iv) Agile model (4 Marks)