



DEDAN KIMATHI UNIVERSITY OF TECHNOLOGY

UNIVERSITY EXAMINATIONS 2021/2022 ACADEMIC YEAR THIRD YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN BUSINESS INFORMATION TECHNOLOGY

CIT 3109: SOFTWARE ENGINEERING

DATE: 8TH MARCH 2022

TIME: 11:00AM-1:00PM

Instructions: Answer Question **ONE** and **ANY** Other **TWO**.

QUESTION ONE [30 MARKS]

- a) Differentiate between software engineering and system engineering. [2 marks]
- b) Gathering requirements is a key activity in the development of any software product.
i) Giving examples discuss the term “*requirements*” [2 marks]
ii) Describe *three problems* with requirements. [3 marks]
- c) Briefly describe the issues that led to the “software crisis” [4 marks]
- d) Change is inevitable” discuss *three causes of change* in requirements engineering. [3 marks]
- e) Discuss how software prototyping can improve the quality of a software system during the following phases of the software life cycle giving examples in each case:
i) requirements analysis and specification
ii) design
iii) testing. [8 marks]
- f) i) In the context of Software Engineering, define the two terms: **validation** and **verification** giving examples of each; discuss the importance of these two activities in the Software Life Cycle. [4 marks]
ii) Discuss the roles that the customer(s) and the software development team play in software validation. [2 marks]
- g) Discuss why corrective maintenance can occur and how it could be avoided or if it is inevitable. [2 marks]

QUESTION TWO [20 MARKS]

- a) Discuss the key ways in which software reuse can potentially result in improvements to the quality of software produced by the company, and identify at least one risk associated with software reuse. [4 marks]
- b) Differentiate between the following testing methods as used in software validation
 - i) Alpha testing
 - ii) Beta testing. [2 marks]
- c) Software quality managers are responsible for three kinds of activity. Explain these activities. [6 marks]
- d)
 - i) What is configuration management (CM)? [2 marks]
 - ii) Distinguish between a version and a release in reference to CM . [2 marks]
- e) Because of the changing business environment, it is often impossible to arrive at a stable, consistent set of system requirements. Businesses may be willing to accept lower quality software if rapid delivery of essential functionality is possible. Explain any two characteristics of Rapid application development (RAD). [4 marks]

QUESTION THREE [20 MARKS]

- a) As a software project manager, briefly discuss THREE techniques for estimating the effort and the costs associated to this project. [3 marks]
- b) Distinguish between the following: Unit testing, Integration testing and User Acceptance testing. [6 marks]
- c) Briefly define debugging and describe the debugging process [5 marks]
- d) During interface design, a number of errors can arise, discuss three types of interface errors. [6 marks]

QUESTION FOUR [20 MARKS]

- a) Discuss what is meant by software change management in the context of Software Engineering and outline the process of software change management, its key practices, and discuss one specific tool that supports software change management. [8 marks]
- b) The success of software development as an engineering discipline can be measured by production of quality software delivered on time, within budget, and satisfying users' needs. Discuss how the *modularity* and *decomposition* principles with supporting techniques and tools, can facilitate the success of both the process and product of software development. [4 marks]
- c) In functional independence there are two measures commonly used: cohesion and coupling. Differentiate between cohesion and coupling. [4 marks]
- d) A computer system is to be developed using multiple programming languages to satisfy a long list of requirements including: functionality; usability; and portability. Describe the term usability and portability. [4 marks]