



(University of Choice)

**MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)**

MAIN CAMPUS

**UNIVERSITY EXAMINATIONS
2022/2023 ACADEMIC YEAR
FIRST SEMESTER EXAMINATIONS
FOR THE DEGREE
IN
COMPUTER SCIENCE**

COURSE CODE: BCS 311

COURSE TITLE: SOFTWARE ENGINEERING

DATE: 06/12/2022

TIME: 8:00-10:00 am

INSTRUCTIONS TO CANDIDATES

Answer **Question ONE (1)** and any other **TWO**

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 2 Printed Pages. Please Turn Over.

SECTION A: COMPULSORY QUESTION **{30 MARKS}**

QUESTION 1

- a) Explain the meaning of professional software development. **(3 Marks)**
- b) Outline three primary goals of software engineering. **(3 Marks)**
- c) Explain the meaning of Reverse Engineering and highlight a possible goal; within the context of software engineering. **(3 Marks)**
- d) Assume that you are a lead developer of a software company and you have been asked to submit a project/product within a stipulated time-frame with no cost barriers, which model would you select? Given Waterfall, Spiral, RAD, and Incremental. Justify your answer. **(3 Marks)**
- e) Atieno, is a team leader, and her development team has less experience on similar projects; Given Waterfall, Spiral, RAD, and Incremental. Which model can be most appropriate in this situation? Justify your answer. **(3 Marks)**
- f) Define Software Quality, and hence discuss two factors that are attributed to Software Quality. **(3 Marks)**
- g) Discuss three major problems that led to the development of the software engineering field. **(6 Marks)**
- h) Define software process and hence Explain activities which are common for all software process. **(6 Marks)**

SECTION B: ANSWER ANY TWO QUESTIONS {20 MARKS EACH}.

QUESTION 2

- a) Nowadays, most educational institutions, require school management system (software). Describe a school management system. **(2 Marks)**
- b) In Question (a) above, discuss any **three** functional requirements and **two** non-functional requirements. **(10 Marks)**
- c) Explain requirement engineering and hence discuss the major phases in the requirement engineering process. **(8 Marks)**

QUESTION 3

- a) Explain **four** ethical issues that Software Engineers are required to observe in order to promote Software Engineering as a professional. **(4 Marks)**
- b) **“There are no universal software engineering methods and techniques that are suitable for all systems.”** In the light of the above, discuss how a competent software engineer would select a suitable method and technique. **(6 Marks)**
- c) Explain the meaning of software maintenance, and hence discuss any four categories that exist, giving a valid example in each case. **(10 Marks)**

QUESTION 4

- a) With respect to software development, a requirement may serve as the basis of a contract OR the basis for the contract itself. Discuss each case. **(5 Marks)**
- b) Explain Requirement Engineering; and hence outline three common Difficulties during Requirement Elicitations. **(5 Marks)**
- c) Rick D. Craig and Stefan P. Jaskiel-2002, view software testing to be conducted in a systematic way, they suggest different levels of testing. Briefly explain the levels. **(10 Marks)**

QUESTION 5

a) You work for a large "social networking" company which has recently introduced a one-to-one chat mechanism, promising that they will never censor conversations. Users are now reporting that their friends' computers are being compromised by malicious software. When users click on links within messages sent by this malicious software, their machine is also compromised, and spreads the infection still further. A crisis meeting has decided that the chat software must be modified to block this "worm" behaviour. As manager of this project, explain how you will approach the development, how you will estimate how long the task will take, and how you will establish that your solution is safe to deploy.

(10 Marks)

b) You are developing control software for a car whose latest model will have a network connection. Software upgrades will be delivered over the air rather than at service visits, so that any security vulnerabilities can be patched quickly. This in turn means that you will have to provide patches, to deal with both security and safety issues for the next 25 years. Discuss how this is likely to affect your development process, and the implications it will have for costs.

(10 Marks)

End of Exam