(11)

(Knowledge for Development)

KIBABII UNIVERSITY

(KIBU)

UNIVERSITY EXAMINATIONS

2022/2023 ACADEMIC YEAR

END OF SEMESTER EXAMINATIONS

THIRD YEAR FIRST SEMESTER

FOR THE DEGREE IN

(COMPUTER SCIENCE AND INFORMATION TECHNOLOGY)

COURSE CODE: BIT 314/CSC 311

COURSE TITLE: SOFTWARE ENGINEERING

DATE: 22/12/2022 TIME: 9.00 A.M-11.00 A.M

INSTRUCTIONS

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

QUESTION ONE (COMPULSORY) [30 MARKS]

a. Distinguish between software engineering and system engineering. [2 marks]

b. Software engineers should adopt a systematic and organized approach to their work and use appropriate **tools and techniques** depending on the problem to be solved, the **development constraints** and the **resources** available. Explain the meaning of underlined words and phrases. [3 marks]

c. Briefly outline the generic activities common in all software processes. [2 marks]

d. Software process model is simplified representation of a software process, presented from a specific perspective. Name and briefly explain these process perspectives. [3 marks]

e. Explain any TWO attributes of a good software product. [2 marks]

f. Explain any TWO key challenges facing software engineering industry today. [2 marks]

g. Explain any TWO roles of Code of Ethics to software engineers [2 Marks]

h. Explain the meaning of **scope Creep** and explain how it can affect a software production. [3 Marks]

i. What is meant by Computer Aided Systems Engineering (CASE) tools? What are the **TWO** main reasons why analysts rely on CASE- tools [3 marks]

j. Discuss any two error common in system engineering according to peter DeGrace and Leslie Stahl. [3 marks]

k. Compare and contrast the Greece and Roman cultures explain how they affected the quality of software products. [3 marks]

l. In the context of software requirements specification SRS explain why verification and validation is a necessary process? [2 marks]

QUESTION TWO [20 MARKS]

A company is looking forward to develop a new copyrighted and open source software applications that can compete amongst the current social media platforms.

a. The company tasks you to lead the team carrying out feasibility study/ analysis. As a team leader, explain various items you will consider during analysis. In each case explain tools and techniques you will employ in order to deliver a complete feasibility study report. [6 marks]

b. As Chief Analyst for initial investigation and analysis. Give a detailed outline of the different stages of requirements engineering, tools and techniques that you will embrace to deliver a complete and consistent requirements specification document (SRS) to the company.

[6 Marks]

c. For each of the following categories, give a briefly explain of what it entails and the type of information you need to gather when you are investigating the requirements for the proposed software Applications by the company?

i. Functional requirements **[2 Marks]**

ii. Nonfunctional requirements **[2 Marks]**

iii. Usability requirements **[2 Marks]**

iv. Emergent requirements **[2 Marks]**

QUESTION THREE [20 MARKS]

a. What is meant by software process model and how does its choice affect the software product? **[3 marks]**

b. Assume you are working with Microsoft Corporation as a senior software developer. Explain with example various conditions under which you can/ will recommend the company to use the following software process models:

i. Waterfall model **[3 marks]**

ii. Incremental process model **[3 marks]**

iii. Prototyping model **[3 marks]**

iv. Agile methodology **[3 marks]**

c. When you are assessing a legacy/old system, you have to look at it from a **business perspective** and a **technical perspective**. From a business perspective, you have to decide whether the business really needs the system. From a technical perspective, you have to assess the quality of the system and its related support software and hardware. You then use a combination of the business value and the system quality to take one of the following informed decisions: scrap the system, re-engineer the system, replace the system, or continue the system's maintenance. Assume that you assessed four systems and the results of the assessment are as follows: System A: high quality, low business value , System B: high quality, high business value, System C: low quality, low business value and System D: low quality, high business value.

What would be your recommendations for each of these systems? Justify your decisions.

QUESTION FOUR [20 MARKS]

a. Differentiate between a **milestone** and a **deliverable** as used in the study of software engineering. [5 marks]

b. There has been a notion that software design is expensive and require time. Justify this claim. [2 marks]

c. Discus the THREE major constraints of software project, in each cases indicate how it affects software quality. [2 marks]

d. What is software design and what are stages involved? [6 marks]

e. Explain the following software design strategies: [4 marks]

i. Functional design [2 marks]

ii. Object-oriented design [2 marks]

f. Explain cohesion and coupling as a software design attributes. [2 marks]

QUESTION FIVE [20 MARKS]

a. Do you think usability and domain requirements are important in software lifecycle? Explain. [2 marks]

b. Explain the following types of software testing:

i. Statistical testing [2 marks]

ii. Defect testing [2 marks]

c. Explain how one can pursue the following testing strategies

i. Top-down testing [2 marks]

ii. Bottom-up testing [2 marks]

iii. Stress testing [2 marks]

iv. Back-to-back testing [2 marks]

d. Discuss any **THREE** software maintenance strategies used by Microsoft Corporation on their products. [6 marks]