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*(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.

[5 marks]

**QUESTION FOUR**

[20 MARKS]

- a. Differentiate between a **milestone** and a **deliverable** as used in the study of software engineering. [2 marks]
- b. There has been a notion that software design is expensive and require time. Justify this claim. [2 marks]
- c. Discuss the **THREE** major constraints of software project, in each cases indicate how it affects software quality. [6 marks]
- d. What is software design and what are stages involved? [4 marks]
- e. Explain the following software design strategies:
- 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]