INTERNATIONAL UNIVERSITY OF EAST AFRICA
'Learning to Succeed'

FACULTY OF SCIENCE AND TECHNOLOGY

END OF SEMESTER EXAMINATIONS - DECEMBER 2025

PROGRAMME: BIT
YEAR/SEM: YEAR 3/SEMESTER 1
COURSE CODE: BIT3107
NAME: PRINCIPLES OF SOFTWARE ENGINEERING

DATE:
TIME:

INSTRUCTIONS TO CANDIDATES:

SECTION A

Attempt all questions

Question 1:

Entity relationship diagrams (ERDs) are important in modelling systems by software engineers.

a) What is an Entity Relationship Diagram (ERD). (**10 marks**)

b) Describe any three (3) relationships that can be used in an Entity Relationship Diagram. (**6 marks**)

c) Illustrate with an example the relationship between a book (consider a library) and a student, clearly indicating the relationship that exists between the two. (**10 marks**)

d) Briefly describe an attribute of an entity. Use an example for description. (**6 marks**)

e) Give four (4) advantages of using ERD in modelling software systems. (**8 marks**)

Question 2:

Software engineering is a discipline in computer science and Information Technology that adheres to the principles and practices of producing software as a product.

a) Define the term Software Development Lifecycle (SDLC). (**10 marks**)

b) Describe any five roles of a project manager during software development. (**10 marks**)

c) Describe any two stages of SDLC. (**12 marks**)

d) Give four advantages of using SDLC. (**8 marks**)

SECTION B

Answer any three (3) questions. All questions carry equal marks.

Question 1:

a) What is meant by the term "functional requirements" of a system. (**6 marks**)

b) Which activities can be used by a software team to achieve good quality software. (**6 marks**)

c) Using examples, give any four (4) functional requirements of the system. (**8 marks**)

Question 2:

a) What is meant by the term "non-functional requirements" of a system (**6 marks**)

b) Describe a feasibility study as relates to software engineering. (**6 marks**)

c) Using examples, give any four (4) non-functional requirements of the system (**8 marks**)

Question 3:

System design (or design) is one of the most important stages of developing software.

a) Describe system design as a stage of software development. (**10 marks**)

b) Why is cost of software development important while developing software as a product? (**6 marks**)

c) Give any four (4) factors to consider while designing a system. (**4 marks**)

Question 4:

a) Describe the prototyping model. (**8 marks**)

b) Describe software verification and software validation. (**8 marks**)

c) Give four (4) benefits of software verification and validation. (**4 marks**)

Question 5:

A software project can fail due to a number of reasons.

a) Describe any five (5) factors that can cause a software project to fail. (**10 marks**)

b) How can software be installed on a computer. (**6 marks**)

c) Give any two (2) examples of software which can be installed on a computer. (**4 marks**)

Question 6:

a) Briefly describe what is meant by user acceptance testing. (**6 marks**)

b) What are some of the key factors to consider while executing user acceptance testing. (**8**

marks)

c) Describe any two (2) key aspects of good software. (**6 marks**)

Question 7:

a) Describe any four (4) factors that are considered while executing software development as a project. (**8 marks**)

b) Software as a project can be successfully managed by focusing on important aspects of project management. Describe any two (2) factors that can lead to success of developing software as a product. (**8 marks**)

c) Give two (2) reasons why software engineering is important. (**4 marks**)

Question 8:

a) What is software maintenance? (**6 marks**)

b) Give any two (2) ways in which software can be maintained. (**6 marks**)

c) Give four (4) factors why software maintenance is important in the field of software engineering. (**8 marks**)

Question 9:

a) Define the term software testing. (**8 marks**)

b) Give any four (4) aspects of system design which can satisfy the requirements of a user for a mobile money application. (**8 marks**)

c) Give any two (2) approaches to software testing. (**4 marks**)

Question 10:

a) Define the term software Quality. (**8 marks**)

b) Describe any four (4) challenges of encountered during software development. (**8 marks**)

c) Give any four (4) factors that are considered while ensuring the quality of software. (**4 marks**)

Question 11:

a) Describe the waterfall model. (**8 marks**)

b) How do software developers validate software during implementation. (**8 marks**)

c) Give any two (2) advantages of using the waterfall model. (**4 marks**)

Question 12:

a) Define the term requirements engineering. (**6 marks**)

b) Why is requirements engineering an important stage of software development? (**6 marks**)

c) Give any four (4) parties that are involved in the requirements engineering phase. (**8marks**
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