



**NAMIBIA UNIVERSITY  
OF SCIENCE AND TECHNOLOGY**

**FACULTY OF COMPUTING AND INFORMATICS  
DEPARTMENT OF SOFTWARE ENGINEERING**

<b>QUALIFICATION:</b> BACHELOR OF COMPUTER SCIENCE	
<b>QUALIFICATION CODE:</b> 07BCMS	<b>LEVEL:</b> 6
<b>COURSE:</b> SOFTWARE PROCESSES	<b>COURSE CODE:</b> SPS611S
<b>DATE:</b> JULY 2023	<b>PAPER:</b> THEORY
<b>DURATION:</b> 3 HOURS	<b>MARKS:</b> 100

<b>SECOND OPPORTUNITY/SUPPLEMENTARY EXAMINATION QUESTION PAPER</b>	
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**THIS QUESTION PAPER CONSISTS OF 6 PAGES**  
(Including this front page)

**INSTRUCTIONS TO STUDENTS**

1. Attempt all Questions.
2. All questions have to be answered in the Answer Booklet. Clearly indicate the section and question number for each answer.
3. The allocation of marks is an indication of the extent of the expected answer. Answering more than expected does not result in higher marks. Keywords alone are not enough.
4. There are no books, notes or any other additional aids allowed in the examination.
5. A none-programmable calculator is permissible.

**SECTION A: TRUE/FALSE****[10 MARKS]***Write all your answers in the answer booklet provided.*

	<b>Question</b>	<b>True</b>	<b>False</b>
1	A software process consist of the actual performance of the relevant activities, which may or may not be described by a model.		
2	A life cycle model define the main steps in the software life cycle and their sequence, in particular in the software development life cycle.		
3	Software quality testing is the application of a systematic, disciplined, quantifiable approach to the development, operation, and maintenance of software; that is, the application of engineering to software.		
4	Testing is the activity in which a system or component is executed under specified conditions, the results are observed or recorded, and an evaluation is made of some aspect of the system or component.		
5	Requirements testing and analysis is an iterative process with continual feedback from each activity to other activities.		
6	Ethnography is an effective way for discovering requirements from the way in which people actually work, rather than the way in which business process definitions say they ought to work.		
7	Project Metrics are the measures of Software Project and are used to monitor and control the project.		
8	System requirements are intended to describe the system's functions and features from a user perspective.		
9	With legacy systems business policies and rules are definitions of how the business should be carried out and constraints on the business. Use of the legacy application system may be embedded in these policies and rules.		
10	Agile methods are not well suited to largescale system development with the development teams in different places and where there may be complex interactions with other hardware and software system.		

**SECTION B: MULTIPLE CHOICE****[10 MARKS]**

*Write all your answers in the answer booklet provided.*

1. At its most general, a scenario may include:
  - A. A description of what the system and users expect when the scenario starts.
  - B. A description of the normal flow of events in the scenario.
  - C. A description of what can go wrong and how resulting problems can be handled.
  - D. All of the above
  
2. During the requirements validation process, different types of checks should be carried out on the requirements in the requirements document. These checks include:
  - A. Validity checks
  - B. Consistency checks
  - C. Verifiability
  - D. All of the above
  
3. When a standard format is used for specifying functional requirements, the following information should be included:
  - A. A description of the function or entity being specified.
  - B. A description of its inputs and the origin of these inputs.
  - C. A description of its outputs and the destination of these outputs.
  - D. All of the above
  
4. Product metrics may measure:
  - A. How easy is the software to use
  - B. How easy is the user to maintain
  - C. The quality of software documentation
  - D. All of the above

5. Which of the following process is not a part of Software Development:

- A. Requirement gathering
- B. Software design
- C. Implementation
- D. Product management

6. What is a Functional Requirement?

- A. The tasks the program must complete
- B. The tasks the program should not complete
- C. The tasks the developer thinks should be completed
- D. None of the above

7. What does SDLC stand for?

- A. System Development Line Code
- B. Software Design Life Cycle
- C. Software Development Life Cycle
- D. System Development Life Cycle

8. This software development model represents the progress as a linear downward flow:

- A. RAD Model
- B. Waterfall Model
- C. Iterative Model
- D. Big bang Model

9. Which of the following statements has nothing to do with the Evolutionary Process Model?

- A. WINWIN Spiral Model
- B. Concurrent Development Model
- C. Incremental Model
- D. All of the above

10. Agile Software Development is based on which of the following type?

- A. Incremental Development
- B. Iterative Development
- C. Both Incremental and Iterative Development
- D. Waterfall Development

**SECTION C:**

**[40 Marks]**

*Write all your answers in the answer booklet provided.*

**Differentiate between the following terms: [20 Marks]**

1. Plan driven processes; Agile processes (*1 similarity and 1 difference*). (4 marks)
2. Software re-engineering; Refactoring (4 marks)
3. Redundancy; Diversity (4 marks)
4. UML diagram; Use case Diagram (4 marks)
5. Regression testing; Automated tests (4 marks)

**Define each of the following terms: [20 Marks]**

5. Explain why legacy systems should be thought of as socio-technical systems rather than simply software systems that were developed using old technology (6 marks)
6. Briefly describe the three (3) main types of software maintenance. (6 marks)
7. Code-and-fix is a development model that is commonly used. Give three (3) disadvantage of Code-and-Fix model. (3 marks)
8. Provided below are sample error distribution of the different classifications of the errors. Let us assume a sample hypothetical project called **Testing\_Docs** with **325 KLOC** and the development effort hours of **540 man-hours**. The error distribution is given in the below table. Lookup the below **table** for the number of design and development errors detected during those phases. Calculate the Development Errors Removal Effectiveness (DERE) for the project based on the given data:

**Table: Error detected Distribution**

	Simple	Average	Complex	Total
Design & Dev Errors	6	7	2	15
Code & Testing Errors	21	12	7	40
Defects in 1 year of maintenance service	9	6	3	18

KLOC= classic metric that measures the size of software by thousands of code lines.

NDE = total number of development (design and code) errors detected in the development process.

WCE = weighted total code errors detected by code inspections and testing.

WDE = total weighted development (design and code) errors detected in development process.

NYF = number software failures detected during a year of maintenance service.

WYF = weighted number of software failures detected during a year of maintenance service.

(5 marks)

**SECTION D: COMPUTATIONAL / SENARIO**

**[40 Marks]**

*Write all your answers in the answer booklet provided.*

**Answer each of the following questions briefly.**

1. Develop a use case diagram for a simple bank ATM system. Consider two kinds of accounts, savings and checking account, transactions namely deposits, withdrawals, print statement, and check balance. The customer is authenticated by inserting a sim and entering a personal identification number (pin). (20 marks)

2. Based on your experience with a bank ATM draw a sequence diagram for the ATM system. (20 marks)

\*\*\*\*\* End of Exam Paper \*\*\*\*\*