



**NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

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

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

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
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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.*

	Question	True	False
1	Software Engineering is defined as a systematic, disciplined, and quantifiable approach to the development, operation, and maintenance of software.		
2	A non-functional requirement is the task the program must complete.		
3	The first step in the software development lifecycle is Preliminary Investigation and Analysis.		
4	The major drawback of the Spiral Model is that it doesn't work well for smaller projects.		
5	Spiral and Prototyping models doesn't necessitate defining requirements at the earliest in the lifecycle.		
6	Requirement elicitation stage of software development is the process of converting a system specification into an executable system.		
7	Component design is where you identify the overall structure of the system, the principal components (sometimes called sub-systems or modules), their relationships, and how they are distributed.		
8	Change avoidance and Change tolerance are two related approaches that may be used to reduce the costs of rework.		
9	Verification is about checking whether the requirements describe the intended system objectives and functions.		
10	Traceability Matrix is used to track the requirements and to check the current project requirements are met.		

SECTION B: MULTIPLE CHOICE

[10 MARKS]

Write all your answers in the answer booklet provided.

1. Which of these primary objectives have to be achieved for the requirement model?
 - A. To describe what the customer requires
 - B. To establish a basis for the creation of a software design
 - C. To define a set of requirements that can be validated
 - D. All of the above

2. If requirements are easily understandable and defined, then which model is best suited?
 - A. Waterfall Model
 - B. Prototyping Model
 - C. Spiral Model
 - D. None of the above

3. Which are the three types of software component that may be used in a reuse-oriented process?
 - A. Web services, Collections of services,
 - B. Collections of objects, Stand-alone software systems
 - C. Web services, Stand-alone software systems
 - D. Web services, Collections of objects, Stand-alone software systems

4. Name the person who is responsible for ensuring that the Scrum methodology is understood and properly implemented.
 - A. Scrum Master
 - B. Scrum Developer
 - C. Product Owner
 - D. Sprint Extreme Programmer

5. Which is a software configuration management concept that is a sequence of versions of source code with later versions in the sequence derived from earlier versions.

- A. Baselines
- B. Source code
- C. Codeline
- D. All of the above

6. Which is a software configuration management concept is a definition of a specific system?

- A. Baselines
- B. Source code
- C. Codeline
- D. All of the above

7. What combines procedures and tools to manage different versions of configuration objects that are created during the software process?

- A. Change control
- B. Version control
- C. SCIs
- D. SDLCs

8. Which of the following options are tracked by the configuration management tools?

- A. Tracking of requirements elicitation
- B. Storing use case diagrams
- C. Tracking the releases of system versions to customers
- D. None of the above

9. Which of the below is not a main activity in the requirements engineering process?

- A. Feasibility study
- B. Requirements elicitation and analysis
- C. Requirements specification
- D. Requirements Testing

10. Which aspects are to be taken into account to ensure an effective requirements validation process?

- A. Requirements Documents
- B. Organizational Knowledge
- C. Organizational Standards
- D. All of the above

SECTION C:

[40 Marks]

Write all your answers in the answer booklet provided.

Differentiate between the following terms: [16 Marks]

1. Plan-driven development; Agile-driven development (4 marks)
2. Requirement Validation; Requirement Verification (4 marks)
3. Release testing; User testing (4 marks)
4. Maintainability; Survivability (4 marks)

Define each of the following terms: [24 Marks]

6. There are many different software processes but all must include four activities that are fundamental to software engineering: explain these activities. (4 marks)
7. What is the purpose of the Scrum Sprint Review, who is invited and when is it held during the Scrum life cycle? (4 marks)
8. Briefly describe five (5) principles of agile methods. (10 marks)
9. Using Process Metrics how can you measure the average delay of milestone completion of an SDLC that consists of 6 phases: (6 marks)
 1. Requirements (4 weeks delay)
 2. Analysis (1 week delay)
 3. Logical design (0 weeks delay)
 4. Physical design (4 weeks delay)
 5. Implementation (10 weeks delay)
 6. Testing (6 weeks delay)

Time Table Metric:

ADMC: Average Delay of Milestone Completion

TCDAM: Total Completion Delays (days, weeks, etc.) for all milestones

MS: Total number of milestones

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 sequence diagram showing the interactions involved when a student registers for a course in a university. Courses may have limited enrolment, so the registration process must include checks that places are available. Assume that the student accesses an electronic course catalogue to find out about available courses. (20 marks)

2. Using the UML graphical notation for object classes, design the following object classes, identifying attributes and operations. Use your own experience to decide on the attributes and operations that should be associated with these objects. (20 marks)

2.1 library catalogue

2.2 printer for a personal computer

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