EXTERNAL INTEGRATED SUMMATIVE ASSESSMENT (EISA)

119458 - OCCUPATIONAL CERTIFICATE: SOFTWARE ENGINEER, NQF LEVEL 6, CREDITS 240

WRITTEN EXAMINATION

EXAMPLER

DURATION : 3 HOURS

TOTAL MARKS : 100

PASS MARK : 60%

CANDIDATE INFORMATION													
SURNAME													
NAMES													
ID NUMBER													
EISA REGISTRATION NUMBER													
ASSESSMENT CENTRE													
ASSESSMENT CENTRE ACCREDITATION NUMBER													

	FOR EXAMINER'S USE ONLY			
		MARKS		
	QUESTION NUMBER	Max Mark	Assessor Mark	Moderator Mark
QUESTION 1	1.1.1	5		
	1.1.2	10		
	1.1.3	3		
	1.1.4	2		
	1.1.5	10		
QUESTION 2	2.1.1	8		
	2.1.2	12		
QUESTION 3	3.1.1	4		
	3.1.2	9		
	3.1.3	3		
	3.1.4	4		
QUESTION 4	4.1.1	5		
	4.1.2	10		
	4.1.3	5		
	4.1.4	10		
TOTAL		100		

GENERAL EISA RULES

1. Candidates are only allowed to use the supplied EISA answer books
2. Candidates are only allowed to use a black pen for their answers.
3. Candidates to ensure that their name, surname appears on the front cover page
4. This is a closed book examination.
5. All EISA answer books must be handed back to the invigilator intact. No pages may be torn off from the EISA booklet. The removal of EISA answer books from the examination room is prohibited.
6. Candidates may make use of a calculator in this EISA if needed.
7. Unless this is an online examination where access to a computer will be made available to you; the use of any communication devices, including smart watches, cell phones, tablets, i- Pads, headphones and laptops are prohibited.
8. All cell phones are to be switched off for the duration of the EISA.
9. The invigilator will not assist you with the explanation of questions related to the EISA.
10. Candidates are prohibited from conversing in any manner with other students.
11. Candidates may not leave the Assessment venue room within one hour of the start of the examination and in the last 10 minutes of the allocated examination period.
12. Candidates who are found to be disruptive and unruly in the assessment centre will be requested to leave the assessment centre by the invigilator.

I HEREBY CONFIRM THAT I HAVE READ THE ABOVE EISA RULES AND DECLARE THAT I UNDERSTAND AND ACCEPT THE RULES.

SIGNATURE OF CANDIDATE_____

INSTRUCTIONS TO CANDIDATES

1. Answer all questions.
2. For the knowledge written part, provide clear and concise responses.
3. For the practical scenarios, demonstrate practical application and critical thinking skills.
4. Ensure your answers reflect an understanding of workplace responsibilities, ethics, safety, and legal provisions.
5. This question paper consists of questions from 3 sections:
    - Knowledge modules
    - Practical modules
    - Work experience modules

ELO 1: Design software to meet clients' needs

QUESTION 1 [30]

QUESTION 1.1 [5]

1.1.1 The main objective of systems planning is to:

A. Reduce documentation
B. Ensure alignment between IT projects and business strategy
C. Replace system testing
D. Eliminate risk (1)

1.1.2 Which of the following is NOT a primary activity of systems analysis?

A. Understanding the current business problem.
B. Determining system requirements.
C. Generating a system analysis report.
D. Coding the application modules. (1)

1.1.3 In Agile methodologies, work is typically divided into short development cycles called:

A. Phases
B. Milestones
C. Iterations or Sprints
D. Modules (1)

1.1.4 Define design principles in the context of systems analysis and design. (2)

QUESTION 1.2 [10]

1.2.1 Which of the following are considered tools for information gathering?

A. Interviews and questionnaires
B. Compilers and IDEs
C. Database servers
D. Encryption software (1)

1.2.2 Why is it important to use multiple information-gathering techniques when analysing requirements?

A. To increase software execution speed
B. To ensure completeness and accuracy of requirements
C. To reduce coding errors
D. To improve graphical user interface design (1)

1.2.3 When reviewing legacy documentation to understand current workflows, which technique is being applied?

A. Document review
B. Focus group
C. User interview
D. Network analysis (1)

1.2.4 Explain how poor information gathering can negatively affect the final software product (3)

1.1.5 QCTO has over 1500 accredited training providers spread across all provinces in South Africa. Identify TWO possible limitations of interviews as information gathering technique and suggest TWO possible solutions for those limitations (4)

QUESTION 1.3 **[3]**

1.3.1 State any ONE benefit of proper system documentation (1)

1.3.2 Describe the term system design in context of software engineering (1)

1.3.3 You are part of QCTO development team, explain how you would ensure system design documentation supports collaboration and long-term system maintenance (1)

QUESTION 1.4 **[2]**

1.4.1 State any ONE standard method to ensure proper system documentation (1)

1.4.2 As a software engineering, explain why proper system documentation is important (1)

QUESTION 1.5 **[10]**

1.5.1 Which of the following are common categories of IT solutions used to solve business problems? *(Select THREE)*

A. Database Management Systems
B. General Maintenance
C. Network infrastructure
D. Office furniture systems
E. Cybersecurity solutions (3)

1.5.2 Explain how analysing business requirements helps in recommending the right IT solution. (3)

1.5.3 A retail company wants to analyse monthly sales trends, inventory levels, and customer buying patterns to improve marketing strategies. Which type of information system would you recommend and why? (4)

Question 2 - ELO 2: Design and manipulate databases **[20]**

QUESTION 2.1 **[8]**

2.1.1 Define data modelling in the context of software engineering (2)

2.1.2 Discuss the role of normalization in database design (2)

2.1.3 A retail store wants to implement a database system to manage inventory, sales, and customer data. Identify the most suitable type of database model and

explain why this model is appropriate (4)

QUESTION 2.2 **[12]**

2.2.1 Describe why normalisation is an important part of the logical design phase. (4)

2.2.2 Describe the differences between physical design and logical design of a database. (4)

2.2.3 Given a university wants to store information about students, courses, and lecturers. Explain what steps would be taken in the physical design phase (4)

ELO 3: Develop software to add value to the organisation **[20]**

QUESTION 3.1 **[4]**

3.1.1 Identify and state ONE deployment platform used in software engineering (1)

3.1.2 Describe automated deployment in software engineering (1)

3.1.3 A software application is ready for deployment, but the company wants to ensure minimal downtime for users. Explain how blue-green deployment could achieve this. (2)

QUESTION 3.2 **[9]**

3.2.1 Define what is meant by design specifications in software development. (3)

3.2.2 What standard methods do you apply to write source code (3)

3.2.3 Explain any THREE reasons for software developers to follow coding standards (3)

QUESTION 3.3 **[3]**

3.3.1 Briefly describe what is meant by the term debugging in software engineering (1)

3.3.2 Explain what is meant by semantic error in debugging . (1)

3.3.3 A program fails when the user inputs a negative number, but works fine for positive numbers, describe how you would correct this during debugging (1)

QUESTION 3.4 **[4]**

3.4.1 Explain what a rollback means in deployment in software engineering (1)

3.4.2 Briefly explain what canary deployment is (1)

3.1.4(c) A program that calculates students' final grades crashes when processing missing or invalid scores. Identify any ONE likely error type (2)

QUESTION 4 - ELO 4: Test or debug source code to ensure client's needs are met **[30]**

QUESTION 4.1 **[5]**

4.1.1 Define non-functional test (2)

4.1.2 Explain load testing as a non-functional testing type (1)

4.1.3 Describe the difference between Load Testing and Stress Testing in non-functional test design. (2)

QUESTION 4.2 **[10]**

4.2.1 Explain the difference between performing functional tests and performing non-functional tests. (3)

4.2.2 List any THREE activities involved when performing functional testing. (3)

4.2.3 An e-commerce website must handle 5,000 users simultaneously without performance degradation. Design a non-functional test specification to verify this requirement. (4)

QUESTION 4.3 **[5]**

4.3.1 Define a test report in software engineering (1)

4.3.2 List any TWO components commonly included in a test report. (2)

4.3.3 As a software engineer, you have been informed that login system was tested with 20 functional test cases. 15 passed and 5 failed. Write your recommendation to the software testers (2)

QUESTION 4.4 **[10]**

4.1.4(a) List any THREE main stages involved in producing a testing report. (3)

4.1.4(b) Describe the importance of analysing defects before including them in the testing report. (3)

4.1.4(c) System testing of a payroll application show 100 test cases executed, 80 passed, 20 failed
Prepare a structured summary section of a system testing report covering:
Test Summary
Recommendation (4)

Total Marks: [100]