



ZIMBABWE

**MINISTRY OF HIGHER AND TERTIARY EDUCATION,
INNOVATION, SCIENCE AND TECHNOLOGY
DEVELOPMENT**

**HIGHER EDUCATION EXAMINATIONS COUNCIL
(HEXCO)**

NATIONAL CERTIFICATE

IN

INFORMATION TECHNOLOGY

MODULE: Programming Concepts (Theory) PAPER NO: 317/22/M02A

DURATION: 3 Hours

MAY/JUNE 2024 EXAMINATION

REQUIREMENTS

Answer booklet.

INSTRUCTIONS TO CANDIDATE

Answer ALL questions.

PAPER NO: 317/22/M02A – PROGRAMMING CONCEPTS - THEORY

QUESTION 1

- (a) List three fact finding methods that can be used in gathering information during requirements analysis. (3 marks)
- (b) Explain the stages of requirements analysis. (8 marks)
- (c) State four benefits of using Pseudocode in designing programs. (4 marks)

QUESTION 2

- (a) Describe the two types of comments found in C++ Programming. (4 marks)
- (b) Explain any three main components of a C++ program structure. (6 marks)
- (c) Identify any two differences between procedural programming and functional programming. (4 marks)

QUESTION 3

- (a) Draw a flowchart to calculate the average of 10 numbers. (10 marks)
- b) Distinguish between the following and include appropriate examples in each case
 - (i) while loop and do while loop (4 marks)
 - (ii) if ...else and switch statement (4 marks)
 - (iii) function prototype and function definition (4 marks)

QUESTION 4

- (a) The int variable z contains the number 5. Calculate the value of the following logical expression
 - (i) $z < 15 \ \&\&z \geq -5$ (2 marks)
 - (ii) $!z \mid z == 5$ (2 marks)
- (b) With the aid of an example, describe the structure of a for... loop statement. (3 marks)
- (c) Write a statement to declare and initialise an array called marks to hold the following marks, 60, 50, 25, 73, 80 (3 marks)

QUESTION 5

- (a) Explain the term software architecture as used in programming. (2 marks)
- (b) Describe the following features of OOP,
- (i) Polymorphism (2 marks)
 - (ii) Inheritance (2 marks)
 - (iii) Encapsulation (2 marks)
 - (iv) Object (2 marks)
 - (v) Class (2 marks)

QUESTION 6

Explain the following file modes

- (a) ios::in (2 marks)
- (b) ios::out (2 marks)
- (c) ios::app (2 marks)
- (d) ios::trunc (2 marks)
- (e) ios:: ate (2 marks)

QUESTION 7

- (a) Outline three benefits of using functions in programming. (6 marks)
- (b) Describe the three class access specifiers. (6 marks)
- (c) Define a class called "Rect" with two data members (length and width) and a method to calculate the area of a rectangle. (5 marks)

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