



ZIMBABWE

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

**HIGHER EDUCATION EXAMINATIONS COUNCIL
(HEXCO)**

NATIONAL CERTIFICATE

IN

ELECTRONIC ENGINEERING: COMPUTER SYSTEMS

MODULE: C++ Programming

PAPER NO: 322/22/M05

DURATION: 3 Hours

MAY/JUNE 2024 EXAMINATION

REQUIREMENTS

Answer booklet and non programmable calculator.

INSTRUCTIONS TO CANDIDATE

- 1. Answer ALL questions.**
- 2. Each question carries ten (10) equal marks.**
- 3. Start each question on a fresh page.**

This paper consists of 3 printed pages.

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QUESTION 1

Give one advantage and one disadvantage of each of the following fact-finding methods:-

- (a) Interviews (2 marks)
- (b) Observation (2 marks)
- (c) Questionnaire (2 marks)
- (d) Document analysis (2 marks)
- (e) Prototyping (2 marks)

QUESTION 2

- (a) State four (4) data types used in C++. (4 marks)
- (b) With the aid of a flow chart, design a program to find the circumference of a circle. Use the formula $C = 2\pi r$, where π is approximately equivalent to 3,1416. (6 marks)

QUESTION 3

Describe the following programming tools:-

- (a) Flow chart (2 marks)
- (b) Algorithms (2 marks)
- (c) Pseudo code (2 marks)
- (d) Argument (2 marks)
- (e) Editor (2 marks)

QUESTION 4

An LED is interfaced to an Arduino at pin 9. Write an Arduino program to turn ON the LED for a second and then turn it OFF for another second. The LED should repeatedly turn ON and OFF with a delay of 1 second. (10 marks)

QUESTION 5

Distinguish between for -----Loop, Do----- while loop and the while----- loop. (10 marks)

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QUESTION 6

- (a) Explain the concept of abstraction and its role in object oriented programming. (5 marks)
- (b) (i) Explain the term encapsulation as used in OOP. (1 mark)
- (ii) Distinguish between a class and a structure as used in OOP. (4 marks)

QUESTION 7

Discuss the importance of constructors and destructors in C++ classes. (10 marks)

QUESTION 8

- (a) Define an identifier. (2 marks)
- (b) Outline the rules for naming identifiers. (5 marks)
- (c) State the syntax for declaring an array. (3 marks)

QUESTION 9

Describe the following utilities as programming tools in C++ programming language:-

- (a) Loader (2 marks)
- (b) Compiler (2 marks)
- (c) Linker (2 marks)
- (d) Debugger (2 marks)
- (e) Assembler (2 marks)

QUESTION 10

Draw a flow chart for a program which calculates and displays the sum of all even numbers between 0 and 21. (10 marks)

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