



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 2025 EXAMINATION

REQUIREMENTS

Answer Booklet

INSTRUCTIONS TO CANDIDATE

Answer all questions.

This paper consists of 4 printed pages.

QUESTION 1

- a) Distinguish between user requirements and system requirements. (4 marks)
- b) Discuss any two (2) fact finding methods used to gather data during requirements analysis. (6 marks)
- c) Outline any three (3) benefits of developing software in-house over outsourcing software development. (6 marks)
- d) State any two (2) differences between an algorithm and pseudocode. (4 marks)

QUESTION 2

- a) With an aid of a diagram, explain the three (3) programming constructs. (9 marks)
- b) Draw a flowchart to determine if a given year is a leap year or not. A leap year is exactly divisible by four (4) except for century years (years ending with 00). The century year is a leap year only if it is perfectly divisible by 400. (7 marks)
- c) Explain any two (2) programming paradigms. (4 marks)

QUESTION 3

- a) Outline three (3) benefits of software architecture. (6 marks)
- b) Define the following OOP feature and state one advantage of each:
 - i) Polymorphism (3 marks)
 - ii) Inheritance (3 marks)
 - iii) Encapsulation (3 marks)
 - iv) Abstraction (3 marks)
- c) Distinguish a class from an object. (2 marks)

QUESTION 4

- a) Explain the purpose of the following in CH program:
 - i) Comments (2 marks)
 - ii) Namespaces (2 marks)
 - iii) Pre-processor directives (2 marks)
 - iv) Return statement (2 marks)

- b) Identify the type of programming error that would occur in each of the following scenarios:
- i) A program written with a missing semicolon at the end of a statement. (1 mark)
 - ii) A function is called with an incorrect number of functions. (1 mark)
 - iii) A program uses a variable before it is initialised. (1 mark)
 - iv) A program has an infinite loop that never terminates. (1 mark)
- c) Distinguish between the following:
- i) Standard data types and user defined data types. (2 marks)
 - ii) Variable and constant identifier. (2 marks)
 - iii) Function prototype and function definition. (2 marks)
 - iv) Pass by value and pass by reference. (2 marks)

QUESTION 5

- a) Assume *int x = 5 and y = 2*. Evaluate Z in the following expressions:

- i) *int Z = (X > y) && (x * 2);* (2 marks)
- ii) *int Z = (X > y) ? x + 1 : y - 1;* (2 marks)
- iii) *int Z = (X == Y) || (x + y);* (2 marks)

- b) Determine the output of the following code; (3 marks)

```
#include< iostream >
Using namespace std;
Int main ( ) {
Int arr [3] [3]={4,5,3}, {2,7,1}, {6,8,9}};
For (int i=0; i<3; ++i) {
For (int j= 0; j< 3; ttj){
cout<<arr[i] [j] << " "
}
cout<<endl;
}
Return 0;
}
```

c) Outline the difference between the following;

- i) Binary file and text file. (2 marks)
- ii) Ofstream and fstream (2 marks)
- iii) ios::ate and ios::app (2 marks)
- iv) Private access specifier and Protected access Specifier (2 marks)
- v) Write a code segment to declare a structure called "Patients" to store gender, age and name. (3 marks)
Include an object of the structure in your declaration.

.../tez