higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

INTRODUCTION TO SYSTEMS DEVELOPMENT

(First paper)
NQF LEVEL 2

(10041022)

25 November 2024 (X-paper)
09:00–11:00

Calculators may be used.

This question paper consists of 7 pages.

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INTRODUCTION TO SYSTEMS DEVELOPMENT
(First paper)
NQF LEVEL 2
TIME: 2 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer all the questions.
2. Read all the questions carefully.
3. Number the answers according to the numbering system used in this question paper.
4. Start each section on a new page.
5. Use only a black or blue pen.
6. Write neatly and legibly.

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SECTION A

QUESTION 1

Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question number (1.1–1.10) in the ANSWER BOOK.

1.1 Ubuntu Linux is an example of an ….

A open-source spreadsheet program
B open-source operating system
C open-source antivirus package
D open-source relational database

1.2 What is the value of the median in the data range: 11, 13, 15, 23, 31, 42, 56?

A 15
B 56
C 31
D 23

1.3 When the VB.Net statement, `inTest = CInt(txtTest.Text)` is executed it will convert `txtTest.Text` …

A to a colour code value and store it in `inTest`
B to an internal common value and store it in `inTest`
C to an integer value and store it in `inTest`
D to its equivalent character code and store it in `inTest`

1.4 Which of the following is an example of a high-level programming language?

A Python Programming Language
B Assembly Programming Language
C Machine Code Language
D Hardware Description Language

1.5 What does a diamond-shaped symbol represent in a flowchart?

A Decision
B Process
C Document
D Connector

1.6 In computer programming, the practice of tracking and managing changes to software code and other files over time, are commonly known as …

A code control
B software control
C version control
D file control

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1.7 `UTF-8` is an example of a type of …

A character encoding system.
B numeric encoding system.
C encryption encoding system.
D data encoding system.

1.8 Which one of the following is a logical operator?

A GET
B AND
C SET
D SQL

1.9 A programming calculation that results in division by zero will produce a …

A Syntax error
B Logical error
C Run-time error
D Overflow error

1.10 Which one of the following primitive data types will allow you to store the numerical value `3.141592653589793`?

A Integer
B Boolean
C Double
D String

(10 × 1) **[10]**

QUESTION 2

Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (2.1–2.5) in the ANSWER BOOK.

2.1 Pseudocode is a compiled programming language used extensively in automating computer hardware functionality.

2.2 Multithreading in programming refers to the ability of a CPU or a single program to execute multiple threads concurrently.

2.3 An algorithm can be defined as a procedure or formula for solving a problem based on conducting a sequence of specified actions.

2.4 A frequency table is a tool used in statistics to organise and display how often each value or group of values occurs in a data set

2.5 Proprietary software is free to use and distribute.

(5 × 1) **[5]**

QUESTION 3

Choose the correct term from those in brackets and write it next to the question number (3.1–3.5) in the ANSWER BOOK.

3.1 The process of identifying and correcting errors in a computer program is called (controlling | debugging | validation).

3.2 In VB.Net, you declare a variable using the (Dim | Let | Var) keyword, followed by the variable name and data type.

3.3 When you set a Boolean value to TRUE, the equivalent numerical value will be (0 | 1 | NULL).

3.4 The (ALU | BUS | CPU), often referred to as the brain of the computer, is responsible for executing instructions and processing data in a computer system.

3.5 EBCDIC and Extended ASCII both use (8 | 16 | 12) bits to represent a character.

(5 × 1) **[5]**

TOTAL SECTION A: 20

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SECTION B

QUESTION 4

4.1 A computer system is composed of several components that work together to perform tasks and process data. These components can be broadly classified into hardware and software**.**

4.1.1 What is the difference between hardware and software? (4)

4.1.2 Name FIVE different types of software. (5)

4.1.3 What is a *peripheral device*? (2)

4.2 List SIX functions of an operating system. (6)

[17]

QUESTION 5

5.1 Different generations of programming languages refer to the stages of development and evolution that programming languages have gone through over time.

5.1.1 What is the difference between 2nd generation and 3rd generation programming languages? (4)

5.1.2 Name any FOUR 3rd generation programming languages. (4)

5.2 Object-oriented programming is a technique in which a complex program is broken down into interacting objects.

5.2.1 Name TWO benefits of code recycling in object-oriented programming. (2)

5.2.2 Write the following programming acronyms in full:

(a) EDP
(b) RAD

(2 × 2) (4)

5.2.3 Differentiate between *classes* and *objects*. (4)

5.3 Briefly describe the following steps or phases of the Program Development Life Cycle (PDLC):

5.3.1 Problem Definition

5.3.2 Program Design

5.3.3 Construction

(3 × 2) (6)

[24]

QUESTION 6

6.1 What is the purpose of a `data type` in computer programming? (2)

6.2 Name FIVE different algorithms that are commonly used in software development. (5)

6.3 Draw a flowchart for the systems development scenario below:

The program must prompt the user to enter the number of *hours worked* as well as the *hourly payrate*. Employees who worked more than 40 hours must get paid *overtime* for the extra hours worked. The *overtime payrate* is calculated as twice the normal hourly rate i.e., *hourly payrate * 2.* These inputs must be used to calculate and display the *wages due* using the formulas as indicated:

Wages = HoursWorked * HourlyPayrate
Overtime = (HoursWorked - 40) * (HourlyPayrate * 2)
Final Wages = Wages + Overtime (if any) (10)

6.4 List SIX different methods in which data can be stored (6)

6.5 Name any TWO statistical measures. (2)
[25]

QUESTION 7

7.1 Define the following terms:

7.1.1 Software verification

7.1.2 Software validation

(2 × 2) (4)

7.2 List THREE types of software documentation. (3)

7.3 Identify THREE advantages of having Quality Assurance (QA) as part of developing software. (3)

7.4 Name FOUR levels of testing. (4)
[14]

TOTAL SECTION B: 80
GRAND TOTAL: 100

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