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)

29 November 2023 (X-paper)
09:00–11:00

This question paper consists of 10 pages.

515Q1N2329

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)
INTRODUCTION TO SYSTEMS DEVELOPMENT
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 Software installation is an automated process in which the user answers questions asked by a/an … wizard.

A software
B installation
C program
D system

1.2 Modern operating system such as Mac OS Sierra and Windows 7, 8 and 10 use a … often pronounced 'gooey'.

A graphical user interface
B command line interface
C user interface management
D graphical user management

1.3 The Delphi programming language is suitable for … and comes with an integrated development environment.

A visual component library
B hypertext markup language
C rapid application development
D high level programming language

1.4 Which ONE of the following are the basic steps in a computer program development life cycle?

i Analysing the problem
ii Debugging and testing the program
iii Documenting revision problem
iv Documenting the program

A i and iv
B i and iii
C i, ii and iii
D i, ii and iv

1.5 American Standard Codes for Interchange only support up to … characters.

A 180
B 314
C 215
D 256

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1.6 Cumulative frequency distribution is …

A similar to a bar graph but is used for continuous data such as people's heights.
B the biggest and the smallest values in a range.
C the sum of a particular class and all the classes below it in a frequency distribution.
D the difference between the highest and lowest value in a distribution.

1.7 Which ONE of the following is an algorithm data structure in flow charts?

A WHILE repetition structure
B IF THEN selection structure
C FOR NEXT repetition structure
D FOR NEXT

1.8 A Nassi-Schneidermann diagram …

A is a method used to analyse a problem and then break it down into individual processes by presenting the steps as boxes that are connected with arrows.
B allows a variable to be tested against a list of values.
C follows a top-down design to divide a problem into smaller subproblems until a simple statement finally remains.
D means that the situation is first analysed before logical and informed decisions are made.

1.9 The reason why we test data is to …

A test for logical errors that may occur during the use of the program.
B test whether the value was entered correctly.
C test if the code will return the value.
D get the total and the amount for each item.

1.10 … documentation serve as a general description of the program and includes information such as what the purpose of the program is and which algorithms it uses.

A External
B Internal
C Technical
D End-user

(10 × 1) **[10]**

QUESTION 2

Choose the correct term from those given in brackets and write it next to the question number (2.1–2.10) in the ANSWER BOOK.

2.1 (Pre-release stage/Post-release stage) is an alpha version of the software program being tested using white-box testing techniques.

2.2 These programs manage the computer's resources and (scheduling/re-scheduling) and monitor computer events.

2.3 (Microsoft Windows/Apple's operating system) dominates the PC-market and the company uses this leverage to persuade other software vendors to accept their data formats.

2.4 A second-generation language is also known as a form of (compiler language/assembly language).

2.5 (Visual programming language/Event-driven programming) lets the user specify programs in a two dimensional way by manipulating elements graphically.

2.6 The programmer must prepare documents that describe both the (internal specifications/external specifications) of the job as well as the internal design of the program.

2.7 Extended binary-coded decimal interchange code uses (8/16) bits to represent a character.

2.8 (IF-THEN/IF-THEN-ELSE) selection structure is used to choose among alternative courses of action.

2.9 (Dynamic programming/Greedy) algorithm remembers older results and attempts to use these to speed up the process of finding new results.

2.10 (Direct processing/Batch processing) data are entered during the day and are executed during the night when the computer is not as busy.

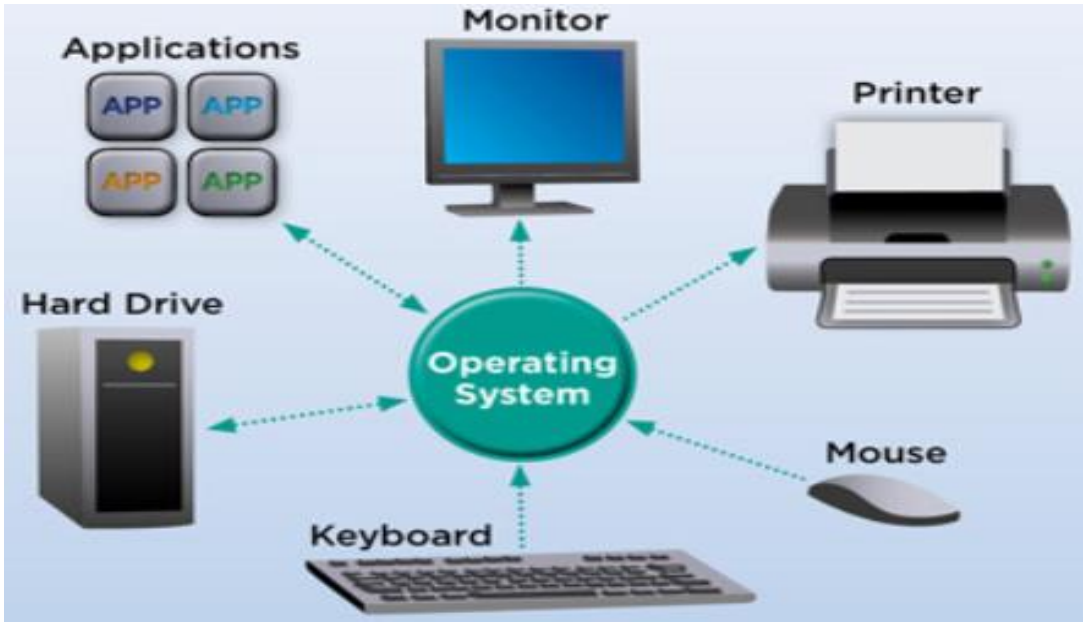
(10 × 1) **[10]**

TOTAL SECTION A: 20

SECTION B

QUESTION 3

3.1 Study the diagram below and answer the questions that follow:



[Source: *https://medium.com/computing-technology-with-it-fundamentals/operating-system-its-functions-and-characteristics-c0946e4215c6*]

FIGURE 1: OPERATING SYSTEM WORKING AS A CORE PART

3.1.1 Explain why a computer cannot function without an operating system. (2)

3.1.2 Identify FIVE functions of operating systems. (5)

3.1.3 Operating system software is classified into THREE broad categories. List these THREE categories. (3)

3.2 Windows 10 is one of various Windows versions of proprietary operating systems. Describe Windows 10. (2)

[12]

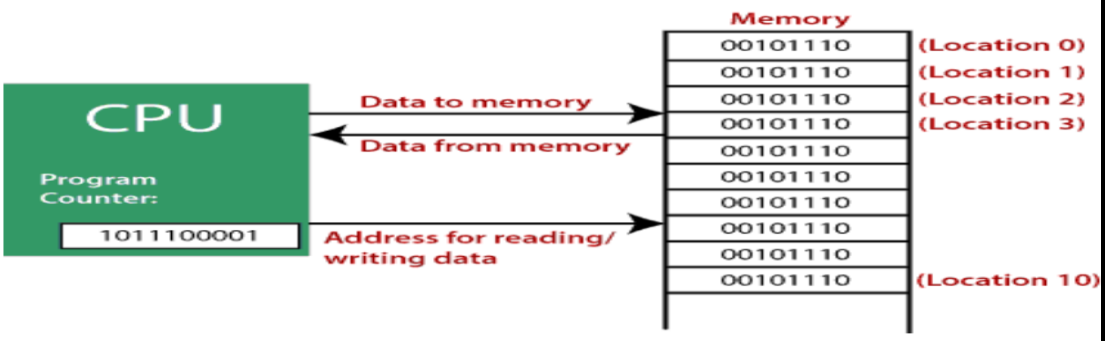
QUESTION 4

4.1 Study the passage below and answer the questions that follow:

Machine language

Machine language is a mixture of binary digits or bits, which can be read and interpreted by the computer. Machine language is the only language that is understood by a computer. The language is in the form of 0's, and 1's so, no one can understand this language quickly.

Machine language is a hardware-dependent programming language. The code in machine language is the only computer program that is understandable by a computer and directly executed by the central processing unit (CPU). Machine language code is strictly written in numerical form.



[Source: *https://www.tutorialandexample.com/low-level-language*]

FIGURE 2: EXAMPLE OF INSTRUCTION TO THE CPU

4.1.1 Which generation language does FIGURE 2 represent? (1)

4.1.2 Define the language mentioned in QUESTION 4.1.1. (2)

4.1.3 What do 0's and 1's represent in FIGURE 2? (1)

4.1.4 FIGURE 2 shows an example of … to the CPU. (1)

4.2 Name THREE high-level programming languages. (3)

4.3 Designing a solution by developing an algorithm is a third step in the computer development life cycle.

Explain FIVE criteria that an algorithm must meet. (5)
[13]

QUESTION 5

Computer data storage is technology consisting of computer components and recording media that are used to retain digital data. It is a core function and fundamental component of computers.

Explain the different methods of storing data listed below and give ONE example of each.

5.1 Primary storage

5.2 Secondary storage

5.3 Off-line storage

5.4 Online storage

5.5 Tertiary storage

(5 × 2) **[10]**

QUESTION 6

6.1 Write the formulas for the FOUR commonly used measures of variability listed below:

6.1.1 Range

6.1.2 Midrange

6.1.3 Variance

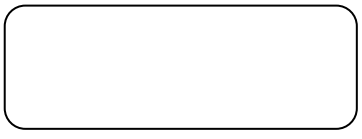
6.1.4 Standard deviation

(4 × 1) (4)

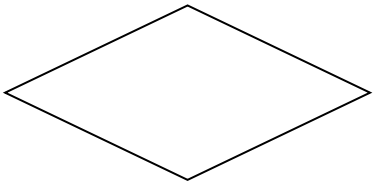
6.2 Differentiate between *critical* and *lateral thinking skills*. (4)

6.3 Give a brief descriptions of the following flow chart symbols:

6.3.1



6.3.2



6.3.3

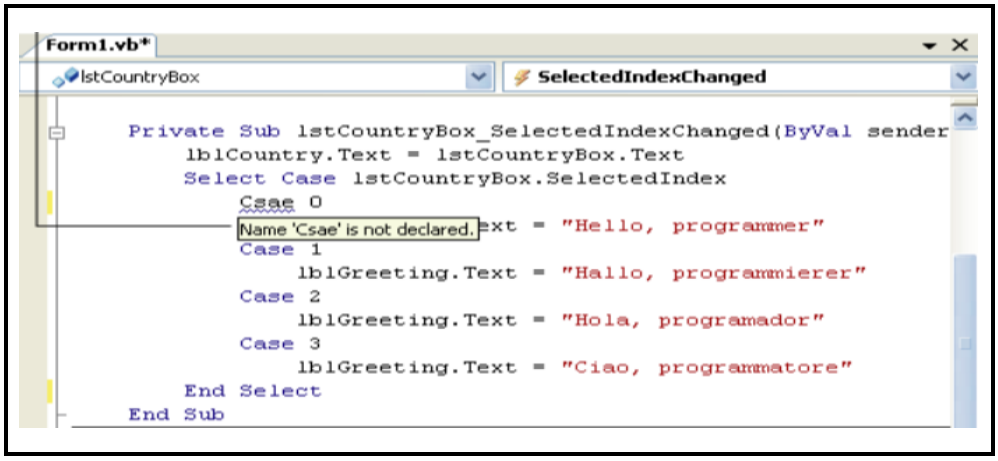


6.3.4



(4 × 2) (8)

6.4 Study the screenshot below and answer the questions that follow:



6.4.1 Identify the type of error indicated in the image above. (1)

6.4.2 Explain the type of error identified in QUESTION 6.4.1. (2)

6.4.3 List THREE other categories of errors caused by the programmers. (3)

6.5 Indicate the prefix of the following controls.

6.5.1 CommandButton

6.5.2 Label

6.5.3 CheckBox

6.5.4 RadioButton

6.5.5 TextBox

(5 × 1) (5)

6.6 Define the term, *debugging.* (2)

6.7 Outline SIX good testing philosophies. (6)

[35]

QUESTION 7

7.1	Explain FOUR aspects of verification.	(4)
7.2	Identify THREE series of questions that are normally asked when evaluating the viability of a project.	(3)
7.3	Outline THREE advantages of batch processing.	(3)
		[10]

TOTAL SECTION B: 80
GRAND TOTAL: 100

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