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)

7 December 2020 (Y-paper)
13:00–15:00

This question paper consists of 6 pages.

361Q1N2007

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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

Write the following abbreviations in full:

1.1 IPO

1.2 VB

1.3 UML

1.4 OOP

1.5 GUI

1.6 IDE

1.7 RAD

1.8 VPL

1.9 EDP

1.10 PHP

(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 (2.1–2.10) in the ANSWER BOOK.

2.1 Hardware is the physical component of a computer, such as the hard drive, printer, monitor, keyboard and mouse.

2.2 Application software is computer software designed to operate the computer hardware and to provide a platform for running application software.

2.3 Low-level language is the lowest-level programming language and the only language understood by computers.

2.4 Polymorphism is the ability of an object to take on different forms, depending on what the function requires in that instance.

2.5 An algorithm is a series of steps or instructions that results in a predicable solution.

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2.6 An IPO chart is a tabular representation of the modules in a program.

2.7 A greedy algorithm is a type of algorithm that remembers older results and attempts to use these to speed up the process of finding new results or solutions.

2.8 Top-down dynamic programming involves formulating a complex calculation as a recursive series of simpler calculations.

2.9 Pseudocode is a generic, compact, informal way of writing an algorithm using the conversions of programming languages, but without language-specific syntax.

2.10 A relational operator is used to tests a certain condition or relationship between two entities (values).

(10 × 1) **[10]**

TOTAL SECTION A: [20]

SECTION B

QUESTION 3

A computer is a machine that accepts data as input, and processes that data using programs, and outputs the processed data.

Based on the above explanation of a computer, answer the following questions:

3.1 Define the term *system software* and give ONE example of system software. (2)

3.2 Give THREE disadvantages and TWO advantages of proprietary software. (5)

3.3 Name THREE characteristics of query languages under 4GL (fourth-generation language). (3)

3.4 Explain FOUR features of programming languages. (8)

3.5 Name and describe TWO categories of coding systems. (4)

3.6 Explain what a string is and give an example thereof. (1)

[23]

QUESTION 4

4.1 Draw the symbols of the following terms of the flowchart and describe each of them.

4.1.1 Terminal

4.1.2 Process

4.1.3 Input/Output

4.1.4 Decision

4.1.5 Connector

4.1.6 Predefined Process/Module symbol

(6 × 2) (12)

4.2 Name THREE data structures used in algorithms. (3)

4.3 Explain THREE activities of QA (quality assurance) processes. (6)

4.4 Differentiate between *implicit* and *explicit declaration* and give an example of each. (2)

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4.5 Software verification and validation uses review, analysis and testing.

Name FOUR levels of testing. (4)

4.6 Compiling and debugging a program takes up much of the overall development time.

Explain THREE categories of errors that a programmer may cause in a program. (6)
[33]

QUESTION 5

5.1 Calculate each of the following

where G = 12 and H = 2, Y = 6 and Z= 4:

5.1.1 G – 5 + 14 mod H ^ 2 (5)

5.1.2 12 × Y \ 3 / 2 – Z + 2 (6)

5.2 Problem statement:

A student wants to create a program that will enable him/her to enter the name and age of a learner on the keyboard and show the name and age on the computer screen.

Do the following planning to write the above statement:

5.2.1 Draw an IPO chart for this problem. (8)

5.2.2 Write a detailed algorithm that shows every step to solve the problem. (5)
[24]

TOTAL: 100

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