NESA | NATIONAL EXAMINATION AND SCHOOL INSPECTION AUTHORITY

SOD – Algorithm and Programming Fundamentals

T169

Tuesday, 20/7/2021
08:30 – 11:30 AM

Names:................................

Index number :................................

TVET NATIONAL EXAMINATIONS, RTQF LEVEL 5, 2020-2021

QUESTIONS and ANSWERS BOOKLET

OPTION/ TRADE : **SOFTWARE DEVELOPMENT**

SUBJECT : **ALGORITHM AND PROGRAMMING FUNDAMENTALS**

ACADEMIC YEAR: **2020-2021**

Read carefully the instructions on page (i) & (ii).

FOR EXAMINER'S USE ONLY

QUESTIONS	1	2	3	4	5	6	7	8	9	10	Total
Marks											

QUESTIONS	11	12	13	14	15	16	17	18	19	20	Total
Marks											

QUESTIONS	21	22	23	24	25	26	27	28	29	30	Total
Marks											

TVET NATIONAL EXAMINATION, RTQF LEVEL 5, 2020-2021

INSTRUCTIONS TO CANDIDATES: PART I (Answer Booklet)

1. A candidate should fill in the actual names and the index number on the cover of this questions and answer booklet on the provided place (Black Box).

2. It is illegal for a candidate to write any of his/her names, index number or a school name inside the answer booklet.

3. A candidate should check if all pages of the answer booklet are complete. No candidate should remove or tear any pages or part of it from the answer booklet.

4. A candidate should answer in the language in which the examination is set. (See page *(ii)*)

5. A candidate should sign on the sitting plan when submitting the answer booklet. He/she has also to check if the answer booklet is well sealed.

6. No extra paper is allowed in the examinations room. If a candidate is caught with it his/her results will be nullified.

7. No candidate is allowed to write answers not related to the subject being sat for, otherwise it will be considered as a cheating case.

8. Write your answers on the 12 lined pages (From page 1 of 12 to page 12 of 12).

9. Use the last non-lined pages as draft.

10. Results for any candidate who is caught in examination malpractices are nullified. The cheating can be recognized during examinations administration, marking exercise or even thereafter.

TVET NATIONAL EXAMINATION, RTQF LEVEL 5, 2020-2021

OPTION/TRADE: SOFTWARE DEVELOPMENT

Subject: Algorithm and Programming Fundamentals

DURATION: 3 hours

INSTRUCTIONS TO CANDIDATES: PART II (Question paper)

The paper is composed of two (2) Sections as follows:

Section I: Attempt all the Twelve (12) questions	**(60 marks)**
Section II: Attempt any Four (4) questions out of Six (6)	**(40 marks)**

Allowed materials:

- Ruler or square
- Calculator

Note:

Every candidate is required to carefully comply with the provided assessment instructions.

Section I : Attempt all the Twelve (12) questions   (60 marks)

01. Convert 1110100110_2 into hexadecimal   **(5 marks)**

02. Convert 1101.101_2 into decimal system.   **(5 marks)**

03. Differentiate while loop from do while loop   **(5 marks)**

04. Define the following terms: **(5 marks)**

    a. Algorithm

    b. Flowchart

    c. Variable

    d. Loop

    e. Linked list

05. Describe various operations which can be performed from a linked list.

(5 marks)

06. Draw a flowchart to determine a student's final grade and indicate whether it is passing or failing according to the marks obtained in 4 subjects. The pass marks should be 50 and above.   **(5 marks)**

07. Differentiate compiler from interpreter.   **(5 marks)**

08. By using truth table differentiate OR with AND logical operator.

(5 marks)

09. a) write a program in C++ to accept a number, and display its cube.

(2 marks)

    b) Draw the flowchart for the above program.   **(3 marks)**

10. Differentiate low level language from high level language.   **(5 marks)**

11. Draw any five (5) logic gate symbols.   **(5 marks)**

12. What are the basic concepts used in the Object-Oriented Programming language?   **(5 marks)**

13. Draw the flowchart of the following algorithm: **(10 marks)**

Step 1: Start

Step 2: Declare variables a, b and c.

Step 3: Read variables a, b and c.

Step 4: If a > b

If a > c

Display a is the largest number.

Else

Display c is the largest number.
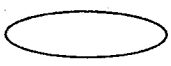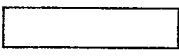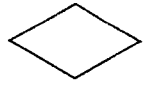
Else

If b > c

Display b is the largest number.

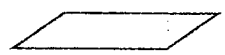Else

Display c is the greatest number.

Step 5: Stop

14. a) Convert 545_8 into decimal.   **(5 marks)**

b) Write an algorithm which receives a number and informs the user whether it is positive or negative.   **(5 marks)**

15. Copy and complete the following table.   **(10 marks)**

Name of the symbol	Diagram	Description

16. Draw the flowchart for finding the roots of quadratic equation.

(10 marks)

17. Write a C++ program using arrays to input 10 numbers and then display them with their squares. **(10 marks)**

18. Demonstrate the following De Morgan theorems by using the truth table.

   a) $\overline{a + b} = \overline{a}.\overline{b}$ **(10 marks)**

   b) $\overline{ab} = \overline{a} + \overline{b}$

Do not write anything on this page !