TEVETA

DIPLOMA IN COMPUTER STUDIES

LEVEL 6 EXAMINATIONS

FINAL INTEGRATED SUMMATIVE EXAMINATIONS

SITTING: APRIL 2022

SUBJECT: ADVANCED PROGRAMMING

TIME: THREE (3) HOURS **TOTAL MARKS: 100**

PASS MARK: 50

INSTRUCTIONS

1. Write your examination number and National Registration Card number on the answer Booklet provided. Ensure to append your signature in the space provided on the answer booklet.
2. Write your answer SCRIPT SERIAL NUMBER on the examination register provided and the entry slip.
3. There are SEVEN (7) questions in this paper.
4. Attempt any FIVE (5) questions of your own choice.
5. All questions carry equal marks.
6. Cell phones and programmable calculators are NOT allowed in the examination room.

DO NOT TURN THIS PAPER UNTIL YOU ARE TOLD TO DO

QUESTION 1

(a) Describe three (3) elements of a formal language. (9 marks)

(b) Describe Bachus Normal Form (BNF) (5 marks)

(c) Explain the following types of grammar

(i) Context sensitive grammar (3 marks)

(ii) Context free grammar (3 marks)

[Total: 20 marks]

QUESTION 2

(a) Describe the structure of a compiler (12 marks)

(b) Distinguish between a compiler and interpreter (8 marks)

[Total: 20 marks]

QUESTION 3

(a) Describe six (6) features of object oriented programming. (12 marks)

(b) List four (4) examples of object oriented programming languages (4 marks)

(c) Describe an object (4 marks)

[Total: 20 marks]

QUESTION 4

(a) Explain the following terms (3 marks)

(i) Data hiding (3 marks)

(ii) Encapsulation (3 marks)

(iii) Abstraction (3 marks)

(b) Explain three (3) reasons programmers are encouraged to do software reuse (6 marks)

(c) Explain the term method signature (4 marks)

[Total: 20 marks]

QUESTION 5

(a) Explain the following terms:

(i) Constructor (3 marks)

(ii) Destructor (3 marks)

(iii) Accessory (3 marks)

(iv) Mutator (3 marks)

(b) Using an object oriented programming language, write example code to illustrate:

(i) A blueprint for an object which defines all the data items contained in the object and operations that are permitted for the data. (4 marks)

(ii) Write a code for creating an object using any object oriented programing language. (4 marks)

[Total: 20 marks]

QUESTION 6

(a) In the following database in prolog, write the response to queries that follow:

```
likes (john,mary).
likes (john,trains).
likes (peter, fast-cars)
likes (Person1, Person 2):-
        hobby (Person1, Hobby),
        hobby (Person 2, Hobby).
hobby (john,trainspotting).
hobby (tim, sailing).
hobby (helen, trainspotting).
Hobby (simon, sailing).
```

(i) ? – likes (john, trains). (3 marks)

(ii) ? – likes (helen, john). (3 marks)

(iii) ? – likes (tim, helen). (3 marks)

(iv) ? – likes (john, helen). (3 marks)

(b) Write the responses to the following queries in prolog:

(i) ? – 4 = 4. (2 marks)

(ii) ? – 4 is 4. (2 marks)

(iii) ? – 4 = 1 + 3. (2 marks)

(iv) ? – 4 is 1 + 3. (2 marks)

[Total: 20 marks]

QUESTION SEVEN

(a) Describe three (3) types of Artificial Intelligence Systems. (12 marks)

(b) Outline the benefits of Artificial Intelligence System. (8 marks)

[Total: 20 marks]