DIPLOMA IN COMPUTER STUDIES

TQF 6 LEVEL EXAMINATIONS

FINAL INTEGRATED SUMMATIVE EXAMINATIONS

SITTING: AUGUST 2017

SUBJECT: ADVANCED PROGRAMMING

TIME: 3 HOURS **TOTAL MARKS: 100%**

PASS MARK: 50%

INSTRUCTIONS TO CANDIDATE

1. Write your Examination Number and National Registration Card Number on the answer booklet provided
2. There are Seven (7) questions in this paper.
3. Attempt any Five (5) questions. All questions carry equal marks.
4. Read instructions carefully.
5. Cell phones and programmable calculators are not allowed in the examination.
6. No candidate is allowed to leave the examination room one hour after the start and thirty minutes before the end of the examination.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO

Question One

(a) Define a translator (2 Marks)

(b) Outline the phases of the program compilation process (12 Marks)

(c) Describe a parse tree (6 Marks)

[Total: 20 Marks]

Question Two

(a) Distinguish between the following terms:

(i) Objects and Classes (5 marks)

(ii) Data abstraction and data encapsulation (5 marks)

(iii) Dynamic binding and message passing. (5 marks)

(b) Describe inheritance as applied to object-oriented programming. (5 marks)

[Total: 20 marks]

Question Three

a. Define the term artificial intelligence. (2 marks)

b. Define the following terms relating to artificial intelligence

i. Machine learning (3 marks)

ii. Knowledge base (3 marks)

iii. Artificial neural networks (3 marks)

c) Outline any three (3) benefits of Artificial Intelligence System. (9 marks)

[Total: 20 marks]

Question Four

a) Explain the following terms

i) Data hiding (3 Marks)

ii) Encapsulation (3 Marks)

iii) Abstraction (3 Marks)

(a) Describe how the principle is in (a) to encourage software reuse (6 Marks)

(b) Explain the term method signature (5 Marks)

[Total: 20 marks]

Question Five

a. Explain the following stages of program translation;
   i. Intermediate code generation (1 mark)
   ii. Code optimization (1 mark)
   iii. Code generation (1 mark)

b. Explain ***byte code*** and the ***advantage*** that it brings about. (5 marks)

c. Give three advantages that object oriented programming brings about. (6 marks)

[Total: 20 marks]

Question Six

a. The visibility specifiers used in class include **private, protected, public**. Explain each of these and their implication. (6 marks)

b. Writer down that will be output (what will be printed on the screen) of the program below, giving brief explanation for your answer (9 marks)

```
using namespace std;
class Rectangle {
  private:
    int Length;
    int Breadth;
    string Color;
  public:
    void SetValues(int L, int B, string C)
    {
        Length = L;
        Breadth = B;
        Color = "Blue";
    }
    void SeeDetails()
    {
        cout<<Color;
        cout<<endl;
        cout<<Length;
    }
    int GetArea()
    {

       return Length * Breadth;
    }
};
int main()
{
   Rectangle R;
   cout<<"This may not work \n";
```

```
    int a = 6,b = 4;
    string Paint = "Yellow";
    R.SetValues(a,b, Paint);
    R.SeeDetails();
    cout<<R.GetArea();
    return 0;
}
```

c. Explain the terms **message passing** as used in OOP. (5 marks)

[Total: 20 marks]

Question Seven

a. Explain the following object oriented concepts
   i. Inheritance
   ii. Polymorphism
   iii. Encapsulation and data hiding (4 marks each)

b. Why is it a good practice to declare **variables** in a class with the **private** key word? (2 marks)

c. Explain **two** types of polymorphism in OOP. (4 marks)

d. Explain **one disadvantage** of object oriented programming. (2 marks)

[Total: 20 marks]