

- Q1 (a) In computer programming, there are important procedures or steps that are commonly implemented to achieve optimal program development which is called *program development cycle*. Briefly explain what is *program development cycle* with the aid of diagram?
(10 marks)
- (b) C++ programming is one example of computer programming languages. However, to implement the computer programming coding will require some preliminary works which includes algorithm as a programming preparation. Discuss the meaning of algorithm and summarize **TWO (2)** algorithm methods.
(9 marks)
- (c) Briefly explain the following computer programming terms.
(i) *Assembler*
(ii) *Compiler*
(6 marks)

- Q2 (a) The following C++ program has some errors. Identify the errors and rewrite the correct program

```
/*Program that calculate volume of the tank in cubic meter
include <iostream.h>;

int main(
{
double W, L, H, Volume /* W = width
of the tank [m], L = length of the tank [m],
H = height of the tank [m], Volume [m^3]*/

cout>>"Enter three Width, Length and Height";
cin>>;
cin>L;
cin>>H;

Volume =(w*L*H); //volume calculation

cout<<"\nvolume of the tank =<<volume;
return 0.
```

(16 marks)

- (b) Draw a full flowchart for the program in Q2(a)

(9 marks)

Q3 As a safety engineer in a car manufacturing company, you need to develop a simple system or program that detect or sense the car crash and immediately deploy an airbag when crash occur at the speed equal or faster than 40km/h. If the accident (crash) happen at speed slower than 40km/h, an airbag will not deploy. Though, both condition of the crash will turn ON hazard light automatically. For practicality of the program development, assume crash detector as 1 when crash is detected and 0 for otherwise (no crash is detected). While, airbag is 1 for an airbag deployment and 0 for no airbag deployment.

- (a) Determine input, output and process in your system? (5 marks)
- (b) Draw the flowchart for the system above? (7 marks)
- (c) Construct the C++ program based on your answer in **Q3(b)** (13 marks)

Q4 (a) Given below C++ program that run a mathematical operation

```
//mathematical operation
#include <iostream>
using namespace std;

int main()
{
    int a=5, b=3, c=6, d=3, sum=8;

    a /= 7 + b;
    b += a * c;
    d = c *= 2;

    sum -= 7 % b-- + --c / ++d;

    cout << "\nthe sum is \t" << sum << endl;
    cout << "\nValue a =\t" <<a;
    cout << "\nValue b =\t" <<b;
    cout << "\nValue c =\t" <<c;
    cout << "\nValue d =\t" <<d<<"\n";

    return 0;
}
```

Estimate the value of a, b, c, d and sum by showing step by step calculation. Illustrate the exact display output screen based on above C++ program

(15 marks)

(b) Draw a flowchart based on given problems;

(i) A program that display circumference by capturing the value of radius (R).
(4 marks)

(ii) A program that read two numbers (num1 and num2). Then, display the indication of whether the first number (num1) is bigger or the second number (num2) is bigger.
(6 marks)

- END OF QUESTION -