PART A : MULTIPLE CHOICE QUESTIONS (50 MARKS)
INSTRUCTION : ANSWER ALL QUESTIONS.
Please write your answer (A/B/C/D) in the answer sheet on page 9.

1. To translate a high-level language into machine codes, a computer needs a/an _____ program.

   A. Assembler
   B. Loader
   C. Compiler
   D. Linker

2. C++ is one of the _____ programming languages.

   A. 1st generation
   B. 2nd generation
   C. 3rd generation
   D. 4th generation

3. _____ is used to fix the _____, and _____ is used to fix _____.

   A. Debugger, logical errors, compiler, syntax errors,
   B. Debugger, syntax errors, compiler, logical errors
   C. Linker, syntax errors, compiler, logical errors.
   D. Debugger, syntax errors, Loader, logical errors.

4. The appropriate data type for a value of **12.50** is _____.

   A. short
   B. float
   C. char
   D. int

5. Which flowchart symbol below is suitable for the selection statement?

A. 

B. 

C. 

D. 

6. What will the output for the following statement be when the input **X** is **-0.5**?

```
((X==0) && ((7 != 8) || (112<230)))
```

A. 0
B. True
C. 0.5
D. False

7. If the variables **letter** and **B** have been defined as character variables, indicate which of the following assignments statements is valid.

A. char letter = B;
B. char letter = ‘B’;
C. char letter = “B”;
D. char letter = (B);

8. Which of the following is the INVALID identifier?

A. VARIABLE
B. variabl3
C. vari.able
D. variable_

9. What is the output for the C++ code segment below?

```
int random = 13.59;
cout << random;
```

A. 14
B. 13.6
C. 13
D. 14.0

10. Given A = 2, B = 5, C = 4 and D = B + A * 5 + (C + B % C). What is the result for D?

A. 40
B. 36
C. 20
D. 16

11. Suppose that x is an int variable. Which of the following expressions always evaluates to true?

A. (x > 0) && (x == 0)

B. (x > 0) && (x <= 0)

C. (x >= 0) || (x == 0)

D. (x > 0) || (x <= 0)

12. Which is the **INCORRECT** statement for selection structure?

A. switch statement
B. do-while statement
C. if-else statement
D. if statement

13. What will be the correct output print on screen from the given code segment?

```
1   int n = 10;
2   bool flag = false;
3
4   cout << ((n > 20) ||  flag) <<endl;
5   cout << (!flag && (n + flag)) <<endl;
6   cout << static_cast<bool> (n) <<endl;
```

A. 0
   0
   0

B. 0
   1
   1

C. 1
   1
   1

D. 1
   0
   0

14. What is the correct output for **X** and **Y**?

```
1   #include <iostream>
2   using namespace std;
3
4   int main()
5   {
6     int x = 1, y = 5;
7
8     x +=y;
9     cout << "X is "<< x << " and Y is
10     "<< y << endl;
11
12    return 0;
13  }
```

A. X is 5 and Y is 1
B. X is 6 and Y is 1
C. X is 6 and Y is 5
D. X is 1 and Y is 5

15. **cin** is standard input stream. What is the function of **cin**?

A. Display output to the screen
B. Read the input from keyboard
C. Delete output on the screen
D. Print the output to the printer

16. Which of the following is used to create a stream class that performs both read and write from/to files?
A. ofstream
B. ifstream
C. fstream
D. iostream

17. The condition to test for unsuccessful opening files are as follows EXCEPT

A. (!input)

B. (!input.fail())

C. (!input.eof())

D. (!input.is_open())

18. Which manipulator sets *n* spaces of a print field for the next value output?

A. setw(n)
B. setfield(n)
C. setspace(n)
D. setprecision(n)

19. Given the following program segment, change the statement by using **`for`** loop.

```
4   int main()
5   {
6       string name;
7       int data =1;
8
9       while (data<5){
10          cout<<"Please enter
11     your name:"<<data;
12          cin>>name;
13
14          data++;
15  }
```

A. for (int data=1;data<5; data++)
B. for (int data=0;data<=5; data++)
C. for (int data=1;data<=5; data++)
D. for (int data=1;data=5; data++)

20. What are the appropriate values that need to be filled in Table 1 if the input, N = 45 and the output will print "Category A" if the conditional test evaluates True, otherwise will print "Category B"?

Table 1

N	**N % 3 == 0**	**Output**
45		

A. True, Category B
B. False, Category B
C. True, Category A
D. False, Category A

21. What will be the value of **Z = pow(4,3)**?
A. 16
B. 64
C. 7
D. 81

22. What is the correct output of the following code segment?

```
1  int x;
2
3  void funct() {
4     x = 4;
5  }
6
7  int main() {
8     ++x;
9     cout << x;
10    funct();
11    cout << x;
12    return 0;
13 }
```

A. 04
B. 14
C. 44
D. 54

23. Which of the following correctly declares an array of size 5?
A. int array [5];
B. int array [ ]={0,1, 2, 3, 4, 5};
C. int array {5};
D. array size[5];

24. Index number of the last element of an array having 10 elements is _____

A. 9
B. 0
C. 8
D. 7

25. Given the following array, what is the value referred to by q_array[0][2]?

3	2	4
7	6	8
0	0	1

A. 4
B. 2
C. 8
D. 0

ANSWER SHEET – PART A	
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	
13.	
14.	
15.	
16.	
17.	
18.	
19.	
20.	
21.	
22.	
23.	
24.	
25.	

PART B : STRUCTURED QUESTIONS (50 MARKS)

INSTRUCTION : ANSWER ALL QUESTIONS.
(Please write your answer in the space provided.)

QUESTION 1 (10 MARKS)

Convert the following numbers, by showing all steps:

a) $2A3_{16}$ from hexadecimal to decimal. (2 marks)

b) -67_{10} from decimal to binary using 16-bit representation and 2's complement calculation. (3 marks)

c) A program fragment given contains the following variables. Please write the output resulting from each following cout statement in Table 1. (5 marks)

```
#include <iostream>
#include <iomanip>
using namespace std;

int main ()
{
    int  a = 28971,b = 37628;
    double c = 29.12;

   cout << setw (3) << a << setw (3) << b << endl;  // Code 1
   cout << setw (6) << a << setw (6) << b << endl;  // Code 2
   cout << setw (7) << a << setw (7) << b << endl;  // Code 3
   cout << fixed << c << endl;  // Code 4
   cout << setprecision (1) << c << endl;  // Code 5

   return 0;

}
```

Table 1

Code	Output																
1																	
2																	
3																	
4																	
5																	

QUESTION 2 (10 MARKS)

Complete the flowchart in Figure 1 that can solve the problem of displaying the multiplication table. This flowchart uses repetition implementation. Take a variable **count** as your counter and set it to one. The multiplication table is based on the number that the user entered. Use a variable **num** for the number that user entered. Then, it will display multiplication table of **num**. In each iteration of the repetition, the variable **count** will be increased by 1. The repetition will be ended when **count** is greater than 10.

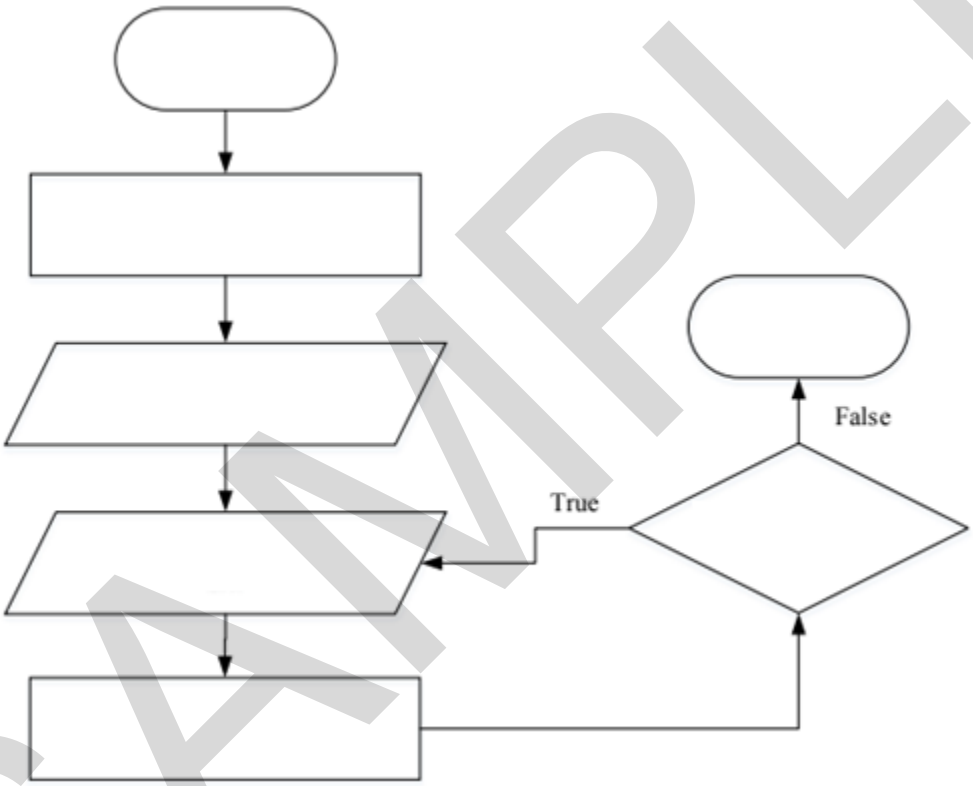

Figure 1

QUESTION 3 (10 MARKS)

a) Convert the following **switch** statement to **if…else** statement. Write the answer and output display in Table 2. (5 marks)

```
1   #include <iostream>
2   using namespace std;
3   int main ()
4   {
5       char  grade = 'B';
6
7       switch(grade){
8         case 'A' : cout << "Excellent";
9                    break;
10        case 'B' : cout << "Good";
11                   break;
12        case 'C' : cout << "Fair";
13                    break;
14        default  : cout << "Invalid";
15                   break;
16        }
17     return 0;
18  }
19
```

Table 2: Answer for Question 3(a)

```
1   #include <iostream>
2   using namespace std;
3
4   int main ()
5   {
6         char  grade = 'B';
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22        return 0;
23  }
```

b. What will be the output produced by the following code? (5 marks)

Code	Output

`for (int i=35; i<60; i=i+3)`
`{`
 	
`  if (i==47)`
`  continue;`
`  if (i==53)`
`  break;`
`  cout<< i<<endl;`
`}`	

QUESTION 4 (10 MARKS):

ABC mini market sells groceries and charges tax on the total price. Write a C++ statement(s) to accomplish each of the following tasks: (10 marks)

a. Declare variables of quantity and price with suitable data types.

b. Declare a variable total price in floating numbers and a variable to store the tax value which is fixed at 3% of the total price.

c. Prompt the user to enter quantity and price as in task (a).

d. Calculate the total price with tax.

e. Display the total price.

Task	C++ statement
a	
b	
c	
d	
e	

QUESTION 5 (10 MARKS):

Answer the following question by referring to program below:

a. Fill in the blanks (a)-(e) to complete the C++ statements. Write the answer in Table 2. (5 marks)

```
1  #include <iostream>
2  _____(a)_____________
3
4  using namespace std;
5
6  _____(b)_____________________
7  float findAverageSqrt(int, int, int);
8
9  int main() {
10   int num1, num2, num3;
11
12   displayTitle();
13
14   cout <<"Type in the first number:";
15   cin>>num1;
16   cout <<"Type in the second number:";
17   cin>>num2;
18   cout <<"Type in the third number:";
19   cin>>num3;
20
21   cout<<"The average square-root is : "<<
22 findAverageSqrt(_____(c)_________) << endl;
23
24   return 0;
25 }
26
27 void displayTitle(){
28   cout <<"Welcome!!" << endl;
29   cout <<"Let's calculate!!" endl;
30 }
31
32 float findAverageSqrt(_____(d)________) {
33   float a;
34   a = (float) (x + y + z) / 3;
35   a = sqrt(a);
36   ___(e)_____
37 }
```

Table 2: Answer for Question 5(a)

Code	Answer
a	
b	
c	
d	
e	

b) Rewrite the following program using an array and a loop to generate the same output.
(5 marks)

```
#include <iostream>
using namespace std;

int main()
{
//Initialize the variables
int n1 = 10;
int n2 = 20:
int n3 = 30;
//Display the output
cout << n1 << " " << n2 << " " << n3;
}
```

Answer Question 5(b)

----------END----------