AGA KHAN UNIVERSITY EXAMINATION BOARD

HIGHER SECONDARY SCHOOL CERTIFICATE

CLASS XII

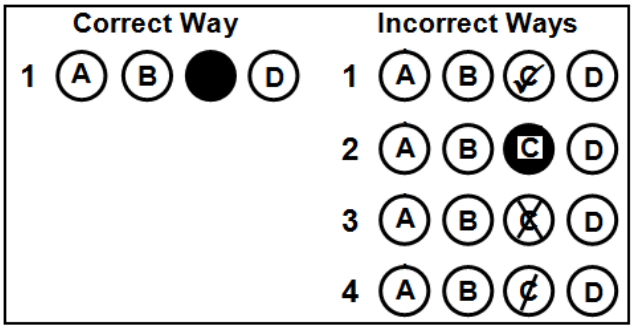
MODEL EXAMINATION PAPER 2023 AND ONWARDS

Computer Science Paper I

Time: 1 hour 30 minutes Marks: 50

INSTRUCTIONS

1. Read each question carefully.
2. Answer the questions on the separate answer sheet provided. DO NOT write your answers on the question paper.
3. There are 100 answer numbers on the answer sheet. Use answer numbers 1 to 50 only.
4. In each question, there are four choices A, B, C, D. Choose ONE. On the answer grid, black out the circle for your choice with a pencil as shown below.



Candidate's Signature

5. If you want to change your answer, ERASE the first answer completely with a rubber, before blacking out a new circle.
6. DO NOT write anything in the answer grid. The computer only records what is in the circles.
8. You may use a scientific calculator if you wish.

1. Read the given characteristics of an operating system.

   - It was developed in early 1970s.
   - It was developed in C language.
   - It strongly defends malware attacks.
   - It is less popular on microcomputers.

   The operating system that has all the given characteristics is

   A. DOS.
   B. UNIX.
   C. Windows.
   D. Macintosh.

2. There are three processes X, Y and Z ready for execution. Each of the given process will require some specific CPU time for its execution.

   CPU Time for Process X = 9 milliseconds

   CPU Time for Process Y = 4 milliseconds

   CPU Time for Process Z = 7 milliseconds

   In order to minimise the execution time, the CORRECT sequence for the execution of the processes would be

   A. X Y Z
   B. X Z Y
   C. Y Z X
   D. Z Y X

3. An operating system that loads one or more programs together in main memory and executes them using a single CPU.

   The given statement describes the process of

   A. multitasking.
   B. batch processing.
   C. multiprogramming.
   D. real-time processing.

4. Consider the following functions.

- File Management
- Memory Management
- Processor Management
- Input/ Output Device Management

All of the given functions are performed by the

A. utility software.
B. operating system.
C. application software.
D. compiler and interpreter.

5. When compared to graphical user interface, the command line interface

A. contains menus for selection purposes.
B. requires lesser memory space.
C. is more user-friendly.
D. is easier to learn.

6. The function of operating system that loads multiple programs, processes, tasks and threads in main memory and executes them at the same time by rapidly switching the CPU among them is called

A. multitasking.
B. multithreading.
C. multiprocessing.
D. multiprogramming.

7. Given are some of the key responsibilities of Umar who is involved in the software development life cycle (SDLC).

- Planning a system flow
- Managing system testing
- Defining technical requirements

Keeping in mind the given responsibilities, he is MOST likely working as a

A. programmer.
B. system analyst.
C. software tester.
D. project manager.

8. In one of the phases of software development life cycle (SDLC), a project team is discussing whether to replace a system or not. The phase in which the project team is deliberating is the

A. design phase.
B. analysis phase.
C. planning phase.
D. requirement engineering phase.

9. A pre-processor directive begins with

   A. #
   B. <
   C. ;
   D. &

10. In a C++ program, which of the following is FIRST executed?

   A. cin
   B. cout
   C. main
   D. getch

11. Based on the variables naming rules, a valid variable name for a C++ program is

   A. _First_Name1
   B. First_N@me
   C. 1_first_name
   D. fir$t_name1

12. Consider the given program.

```
#include <iostream>
using namespace std;
int main()
{
   float a = 3.7;
   float ans = (int)a + 2;
   cout << "Answer = " << ans;
   return 0;
}
```

The output of the program will be

   A. 5
   B. 5.70
   C. 6
   D. an error

13. Consider the given incomplete C++ program.

```
#include <iostream>
using namespace std;
int main()
{
   int num = 13;
   [          ]
   cout << num;
   return 0;
}
```

To get the output 5, the code line that should replace the shaded box in the program will be

A. num = num % 5 + 5 / 5;
B. num = num % 3 + 6 / 3;
C. num = num % 6 + 8 / 4;
D. num = num % 5 + 4 / 2;

14. Read the given lines of a C++ program.

```
#include <iostream>
using namespace std;
int main()
{
        int a = 2, b = 3, c = 4, result = 0;
        a = a + c;
        b = a / b;
        c = a - b;
```

To get output 1, the remaining part of the program will be

result = (a < b) && (c > a);
cout << result;
return 0;
}
	result = (a > b) && (c < a);
	cout << result;
	return 0;
	}

A	B

result = (a < b) || (c > a);
cout << result;
return 0;
}
	result = !((a > b) || (c < a));
	cout << result;
	return 0;
	}

C	D

15. Consider the given C++ program.

```
#include <iostream>
using namespace std;
int main()
{
        int a = 0, b = 0, c = 0;
        a = a++;
        b = ++b;
        c = a + b;
   cout << c++;
   return 0;
}
```

The output of the given program will be

A. 0
B. 1
C. 2
D. 3

16. An example of the ternary operator is

A. ?:
B. --
C. +=
D. &&

17. A C++ program usually starts with the

A. cin keyword.
B. cout keyword.
C. main function.
D. preprocessor directive.

18. The escape sequence that can be used as an alternative to **endl** is

A. \a
B. \b
C. \t
D. \n

19. Consider the given C++ program.

```
#include <iostream>
using namespace std;
int main()
{
        int a = 5, b = 10;
        if(a = 7) b++;
        cout << a + b;
   return 0;
}
```

The output of the given program will be

A. 15
B. 16
C. 17
D. 18

20. A selection statement that tests the condition for equality only is a/ an

A. else-if statement.
B. switch statement.
C. for loop statement.
D. while loop statement.

21. Consider the given incomplete C++ program.

```
#include <iostream>
using namespace std;
int main() {
char x = 'A';
[          ]
return 0;
}
```

To get the output 30, the code that should replace the shaded box in the program will be

switch (A)
{
case 'a':
cout << 15 + 15;
break;
case 'b':
cout << 10 + 10;
break;
default:
cout << 5 + 5;
break;
}
	switch (x)
	{
	case 'a':
	cout << 15 + 15;
	break;
	case 'b':
	cout << 10 + 10;
	break;
	default:
	cout << 5 + 5;
	break;
	}

A	B

switch (x)
{
case 'a':
cout << 5 + 5;
break;
case 'b':
cout << 10 + 10;
break;
default:
cout << 15 + 15;
break;
}
	switch (A)
	{
	case 'a':
	cout << 5 + 5;
	break;
	case 'b':
	cout << 10 + 10;
	break;
	default:
	cout << 15 + 15;
	break;
	}

C	D

22. Consider the given C++ program.

```
#include <iostream>
using namespace std;
int main () {
int a, b, c = 0;
    for(a =1; a < 5; a++)
        {
            cin >> b;
            if( (b % 3) == 0)
            c = b * b;
        }
        cout << c;
        return 0;
}
```

If the input of the program is 9, 10, 11, 12, then the output would be

A. 81
B. 144
C. 225
D. 11664

23. Consider the given C++ program.

```
#include <iostream>
using namespace std;
int main () {
int x = 7;
int y = 14;
        while(x < y)
        {
        y = y + 4;
        cout << "PAKISTAN\n";
        x = x + 6;
        }
        return 0;
}
```

If this C++ program is executed, then the number of times the word PAKISTAN would be printed on screen is

A. 1
B. 4
C. 5
D. 7

24. Consider the given C++ program.

```
#include <iostream>
using namespace std;
int main()
{
   int num, total = 0;
   do
  {
   cin >> num;
   total = total + num;
  }
   while(num != 5);
   cout << total;
   return 0;
}
```

If the input of the given program is 3, 4, 5, then the output would be

A. 4
B. 5
C. 7
D. 12

Use the given program to answer Q.25 and Q.26.

```
#include <iostream>
using namespace std;
int main()
{
int j;
for(j=5; j>1; j--)
cout << j << " ";
cout << endl;
return 0;
}
```

25. The manipulator used in this program is

A. endl.
B. return.
C. iostream.
D. namespace.

26. The code line that should replace **cout << j << " ";** in the program to get the given output will be

```
27 18 11 6
```

A. cout << j * (j + 1) - 3<< " ";
B. cout << (j * 7) - 8<< " ";
C. cout << j + 4 * 3<< " ";
D. cout << j * j + 2<< " ";

27. If strcmp() function is applied on the following two strings, then it outputs integer value is 1.

First String = Apple

Second String = APPLE

Which of the following statements shows the CORRECT interpretation of the given output?

A. First and second strings are the same
B. First string is greater than the second string
C. First string is smaller than the second string
D. Error occurred because strings are not compared.

28. Consider the given illustration of a two-dimensional array named as Weight.

50.7	65.0	67.9	70.3
81.0	56.5	62.4	54.8
66.7	80.9	59.7	85.0

The C++ statement to declare the array will be

A. int Weight [2][3];
B. int Weight [3][4];
C. float Weight [2][3];
D. float Weight [3][4];

29. Which of the following statements is FALSE about the array's index?

A. Is starts from zero
B. Is an integer number
C. Enclosed in square brackets
D. Used to access an array's element of an array

30. The minimum number of predefined functions that each C++ program has is

A. 0
B. 1
C. 2
D. 3

31. Consider the given function signature.

double add(int x, double y)

The return type of the function will be

A. add
B. int x
C. double
D. double y

Use the given program to answer Q.32 and Q.33.

```
#include <iostream>
int P(int z);
using namespace std;
int main()
{
   int a = P(3);
   cout << a;
}
int P(int z)
{
   int b;
        b = z * 4 + 10 / 5;
   return b;
}
```

32. Which of the following statements from the given code declare(s) the function P( )?

I. int a = P(3);
II. int P(int z);
III. int P(int z)

A. I only
B. II only
C. I and III
D. II and III

33. The output of the C++ program will be

A. 4
B. 6
C. 14
D. 18

34. Which of the following statements is FALSE about the function overloading?

A. It allows the declaration of multiple same-named functions.
B. It increases the readability of a program.
C. It decreases complexity of a program.
D. It depicts the role of encapsulation.

35. A return type that a function may have is a/ an

A. loop.
B. array.
C. object.
D. switch-case.

36. Other than function prototype, how many components of a function is/ are there?

A. One
B. Two
C. Three
D. Four

Use the given C++ program to answer Q.37 and Q.38.

```
#include <iostream>
using namespace std;
int main () {
  int  x = 10;
  int  *y;
  y = &x;
  cout << "x variable: " << x << endl;
  cout << "y variable: " << y << endl;
  cout << "*y variable: " << *y << endl;
  return 0;
}
```


37. Which of the following statements is TRUE about the given program?

A. Both * and & are memory reference operators.
B. Both * and & are memory dereference operators.
C. * is a memory reference operator and & is a dereference operator.
D. & is a memory reference operator and * is a dereference operator.

38. At the time of execution, the output of this program will be

x variable: 10 y variable : 0x24fe34 *y variable: 0x24fe34	x variable: 10 y variable : 0x24fe34 *y variable: 10
A	B
x variable: 0x24fe34 y variable : 10 *y variable: 0x24fe34	x variable: 10 y variable : 10 *y variable: 0x24fe34
C	D

39. A statement that stores the address of the variable G into the pointer H is

A. G = H&;
B. G = &H;
C. H = &G;
D. H = G&;

Use the given C++ program to answer Q.40, Q.41, Q.42 and Q.43.

```
#include <iostream>
using namespace std;
class Sample
{
   private:
      int a;
      float b;
   public:
     void j(int d)
     {
       a = d;
       cout << a;
      }
     float k()
     {
        cout << "\nEnter data: ";
        cin >> b;
        return b + 7;
      }
};
 int main()
 {
     Sample e, f;
     float x;
     e.j(6/3);
     x = f.k();
     cout << x;
     return 0;
 }
```


40. The number of data members in the Sample class is

    A. 2
    B. 3
    C. 4
    D. 5

41. The names of the objects in this program are

    A. a and b
    B. b and d
    C. e and f
    D. j and k

42. Which of the following members can be accessed outside of the class?

    A. a and j
    B. k and b
    C. a and b
    D. j and k

43. If the input of this program is 4, then the output will be

4	2 4
A	B
2 11	Error
C	D

Use the given C++ program to answer Q.44, Q.45, Q.46 and Q.47.

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

class Box {
  public:
    double length;
    double breadth;
    double height;
};

int main() {
  Box B1;
  Box B2;
  double volume = 0.0;

  B1.height = 7.3;
  B1.length = 8.5;
  B1.breadth = 10.0;

  B2.height = 12.0;
  B2.length = 13.8;
  B2.breadth = 15.0;

  volume = B1.height * B2.length * B1.breadth;
  cout << "Volume of Box1 : " << volume <<endl;

  volume = B2.height * B1.length * B2.breadth;
  cout << "Volume of Box2 : " << volume <<endl;
  return 0;
}
```


44. The number of data members in the **Box** class is

A. 2
B. 3
C. 5
D. 11

45. The names of objects in the given program are

A. B1 and B2.
B. B1, B2 and volume.
C. length, breadth and height.
D. length, breadth, height and volume.

46. The number of data members that can be accessed inside as well as outside of the class is

	Access Inside the Class	**Access Outside the Class**
A	3	3
B	0	3
C	3	0
D	3	2

47. The output of the program is

Volume of Box1 : 1007.4 Volume of Box2 : 1530	Volume of Box1 : 620.5 Volume of Box2 : 2484
A	B
Volume of Box1 : 1007.4 Volume of Box2 : 2484	Volume of Box1 : 620.5 Volume of Box2 : 1530
C	D

48. If a file named as **testdata.bin** is to be opened in a binary mode to add data, then the C++ code to be used will be

A	ofstream myfile; myfile.open("testdata.bin" , ios::out | ios::app | ios.binary);
B	ifstream myfile; myfile.open("testdata.bin" , ios::in | ios::app | ios.binary);
C	ofstream myfile; myfile.open("testdata.bin" , ios::out | ios::ate | ios.trunc);
D	ifstream myfile; myfile.open("testdata.bin" , ios::in | ios::ate | ios.trunc);

49. Which of the following options is CORRECT about the output of eof()?

I. It returns true when there is no more data to be read from the input file.
II. It returns false when there is no more data to be read from the input file.
III. It returns true when there is data to be read from the input file.
IV. It returns false when there is data to be read from the input file.

A. I only
B. III only
C. I and IV
D. II and III

50. If the file is opened for output operations and its contents are deleted and replaced by the new ones, then the file opening mode used will be

A. ios::ate
B. ios::out
C. ios::app
D. ios::trunc

END OF PAPER

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