

**AGA KHAN UNIVERSITY EXAMINATION BOARD**  
**HIGHER SECONDARY SCHOOL CERTIFICATE**  
**CLASS XII**  
**MODEL EXAMINATION PAPER 2023 AND ONWARDS**  
**Computer Science Paper II**  
**Time: 1 hour 30 minutes    Marks: 35**

**INSTRUCTIONS**

**Please read the following instructions carefully.**

1. Check your name and school information. Sign if it is accurate.

**I agree that this is my name and school.**  
**Candidate's Signature**

**RUBRIC**

2. There are EIGHT questions. Answer ALL questions. Question 7 & 8 offers TWO choices. Attempt any ONE choice.
3. When answering the questions:  
  
Read each question carefully.  
Use a black pointer to write your answers. DO NOT write your answers in pencil.  
Use a black pencil for diagrams. DO NOT use coloured pencils.  
DO NOT use staples, paper clips, glue, correcting fluid or ink erasers.  
Complete your answer in the allocated space only. DO NOT write outside the answer box.
4. The marks for the questions are shown in brackets ( ).
5. You may use a scientific calculator if you wish.

Q.1. (Total 3 Marks)

i. List any ONE task performed by an operating system. (1 Mark)

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ii. Describe the concept of multithreading in an operating system with an example. (2 Marks)

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Q.2. (Total 3 Marks)

List any THREE responsibilities of a project manager in a software development life cycle (SDLC).

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Q.3. (Total 5 Marks)

i. Write C++ statements to show the use of single line and multiple line comments. (2 Marks)

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- ii. List any **THREE** rules for specifying a variable name in a C++ program. (3 Marks)

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Q.4.

(Total 3 Marks)

Read the given C++ program.

```
#include <iostream>
using namespace std;
int main()
{
    int i, n, t=0, r, x = 0;
    cout<<"Enter the value of n:"<<endl;
    cin >> n;
    for(i = 1; i <= n; i++)
    {
        x = i * 9;
        r = x % 5;
        t = t + r;
    }
    cout<<"Result = "<<t;
    return 0;
}
```

If the input value in the program is **3** and **for** loop is executed, then complete the given table by writing the missing values of **x**, **r** and **t** for each iteration (repetition) of the program.

Iteration	x	r	t
1 <sup>st</sup>			
2 <sup>nd</sup>			
3 <sup>rd</sup>			

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Q.5.

(Total 4 Marks)

Write a C ++ program to show the concept of single inheritance in object-oriented programming. The program should include the following:

- A base class named as **College** having a variable named as **CollegeName** that stores the string Rising Star College
- A child class named as **Teacher** that inherits **College** class. It also stores Omar Khan in **TeacherName**, Science Department in **CollegeDepartment** and Math in the **SubName** variables.
- An object of **Teacher** class named as **obj** to display the name of the college, teacher, department and subject.
- The output should be the same as shown below.

```
College Name: Rising Star College
Teacher Name: Omar Khan
Subject Name: Math
Department Name: Science Department
```

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Q.6.

(Total 3 Marks)

Write a C++ program that

- creates a text file named as Test.txt
- writes the following line in the file.  
I Love Pakistan
- closes the file.

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Q.7.

(Total 7 Marks)

**EITHER**

- a. Consider a simple arithmetic calculator which performs addition, subtraction, multiplication and division of two numbers.

Write a C++ program for this calculator using **switch statement** that

- inputs any one of the four arithmetic operators i.e., +, -, \*, /
- inputs any two values having float data type.
- uses switch statements to perform the operation depending upon the input operator
- outputs the result of arithmetic operation.

**OR**

- b. Write a C program for calculating and printing the roots of quadratic equation using quadratic formula.

The quadratic formula to calculate the roots of quadratic equation is given below.

$$\text{Roots} = \frac{-b \pm \sqrt{d}}{2a}, \text{ where } d = b^2 - 4ac.$$

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Q.8.

(Total 7 Marks)

# EITHER

- a. Write a program using a user-defined function named 'RectVol' that would calculate the volume of a rectangular prism and invoke it in the main function.

The formula to calculate the volume is given below.

**Volume of a Rectangular Prism = Length  $\times$  Width  $\times$  Height**

**OR**

- b. Write a C++ program in which a two dimensional is declared and the user can input the values using for loop and print the inputted values.

two dimensional is declared and the user can input  
ted values.

END OF PAPER



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