11th STD

PUBLIC EXAMINATION MARCH - 2025

PART - III

Reg. No.

TIME ALLOWED : 3.00 Hours]   **COMPUTER SCIENCE** (with Answers)   [MAXIMUM MARKS : 70

Instructions :

1) Check the question paper for fairness of printing. If there is any lack of fairness, inform the Hall Supervisor immediately.

2) Use **Blue** or **Black** ink to write and underline and pencil to draw diagrams.

PART - I

Note : (i) Answer **all** the questions.   **15 × 1 = 15**

(ii) Choose the most appropriate answer from the given **four** alternatives and write the option code and the corresponding answer.

1. Name the volatile memory

(a) RAM   (b) ROM

(c) EPROM   (d) PROM

2. In Boolean Algebra A + A = ?

(a) 1   (b) A   (c) $\overline{A}$ (d) 0

3. An example for single task operating system is :

(a) MS-DOS   (b) Linux

(c) Unix   (d) Windows

4. If a = 5 before the assignment a : = a – 1 after the assignment, the value of a is :

(a) 3   (b) 5   (c) 2   (d) 4

5. If C is false just before the loop, the control flows through:

(1) S1   (2) while C

(3) S2   (4) S3

(a) S1; S2; S2; S3   (b) Sl; S3

(c) S1; S2; S2; S2; S3   (d) S1; S2; S3

6. Which of the following is not a data type modifier?

(a) long   (b) signed

(c) short   (d) int

7. How many times the following loop will execute?

for (int a=0; a<10; a++)

(a) 9   (b) 0   (c) 11   (d) 10

8. Which function begins the program execution?

(a) main()   (b) isalpha()

(c) islower()   (d) isdigit()

9. A structure declaration is given below.

struct Time
{
int hours;
int minutes;
int seconds;
}t;

Using above declaration which of the following refers to seconds?

(a) seconds   (b) Time.seconds

(c) t.seconds   (d) Time::seconds

10. Which of the following is a user defined data type?

(a) int   (b) class   (c) object   (d) float

11. Which operator is used to access the class members?

(a) .(dot)   (b) : (colon)

(c) :: (scope resolution)   (d) ; (semicolon)

12. Which of the following refers to a function having more than one distinct meaning?

(a) Operator overloading

(b) Function overloading

(c) Operations overloading

(d) Member overloading

[1]

13. Inheritance is a process of creating new class from:

(a) derived class   (b) Base class

(c) Function   (d) abstract

14. Commercial Programs made available to the public illegally are known as _____ .

(a) free software   (b) freeware

(c) software   (d) warez

15. Expansion for TSCII.

(a) Tamil Scope Code for Information Interchange

(b) Tamil Script Code for Information Interchange

(c) Tamil Scope Code for International Interchange

(d) Tamil Script Code for International Interchange

PART - II

Note: Answer **any six** questions. Question No. **24** is **Compulsory**.   **6 × 2 = 12**

16. What are the components of a CPU?

17. What is a program counter?

18. What are called standard icons?

19. What are the control flow statements?

20. What is the use of setw() format manipulator?

21. What is Polymorphism?

22. List the operators that cannot be overloaded.

23. What is phishing?

24. Write the output of the following program.

```
#include<iostream>
#include<string.h>
int main()
{
    char str1 [50];
    strl="COMPUTER SCIENCE";
    cout<<strlwr(str1);
    cout<<strlen(str1);
}
```

PART - III

Note : Answer **any six** questions. Question No. **33** is **Compulsory.**   **6 × 3 = 18**

25. Convert the given Binary number into its equivalent octal and hexadecimal number. 101110101_2

26. List out the key features of operating system.

27. What is Abstraction?

28. What is Recursion?

29. Write a short note on Array of strings.

30. What are the types of constructors?

31. Differentiate between private, public, protected visibility modes.

32. Write a short note on Tamil Virtual Academy.

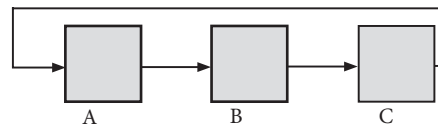**33.** Write a C++ program to sum the numbers from 1 to 10 using for loop.

PART - IV

Note : Answer **all** the questions.   **5 × 5 = 25**

34. (a) Explain the following:

(i) Inkjet Printer   (ii) Multimedia Projector

(iii) Barcode / QR code Reader

(OR)

(b) Circulate the contents: Write the specification and construct an algorithm to circulate the contents of the variables A, B and C as shown below: The arrows indicate that B gets the value of A, C gets the value of B and A gets the value of C.

35. (a) Explain the characteristics of a microprocessor.

(OR)

(b) What is an entry control loop? Explain any one of the entry controlled loop with suitable example.

36. (a) (i) Add : $1101010_2 + 101101_2$

(ii) Subtract : $1101011_2 - 111010_2$

(OR)

(b) Explain call by value method with suitable example.

37. (a) Write the important steps one must follow for creating and executing a C++ program.

(OR)

(b) What are the advantages of OOPs?

38. (a) Debug the following C++ program.

Output :

Enter First String : COMPUTER

Enter Second String : SCIENCE

Concatenated String is : COMPUTERSCIENCE

Program :

```cpp
~INCLUDE<iostream>
~INCLUDE<string.h>
using namespace std;
class strings
{
    PUBLIC;
    char s[20];
    VOID  getstring(char str[]) :
{
    strcpy (s, str) :
}
    void operator+(strings);
};
void strings :: operator+(strings ob)
{
    strcat(s:ob:s);
    cout>> "\n concatenated string is:"<<s;
}
int main[]
{
    strings ob1, ob2;
    char string1[10], string2[10];
    cout>>"\n Enter First String:";
    cin<<string1;
    ob1.getstring(string1);
    cout<<"\n Enter Second String:";
    cin<<string 2:
```

```cpp
    ob2.getstring(string2);
    ob1 + ob2;
    return 0;
};
```

(OR)

(b) Write the output of the following C++ program.

```cpp
#include<iostream>
using namespace std;
Struct Student
{
    int age;
    float height, weight;
}  m;
void main ()
{
    cout<<"Enter the age:"<<end1;
    cin>>m. age;
    cout<<"Enter the height:"<<end1;
    cin>>m.height;
    cout<<"Enter the weight:"<<end1;
    cin>>m.weight;
    cout<<"The values entered"<<end1;
    cout<<m.age<<"\t"<<m.height<<
                    "\t"<<m.weight;
}
```

ANSWERS

PART - I

1. (a) RAM

2. (b) A

3. (a) MS-DOS

4. (d) 4

5. (b) S1; S3

6. (d) int

7. (d) 10

8. (a) main()

9. (c) t.seconds

10. (b) class

11. (a) . (dot)

12. (b) Function overloading

13. (b) Base class

14. (d) warez

15. (b) Tamil Script Code for Information Interchange

PART - II

16. The CPU has three components which are Control unit, Arithmetic and Logic unit (ALU) and Memory unit.

17. The Program Counter (PC) is a special register in the CPU which always keeps the address of the next instruction to be executed.

18. The icons which are available on desktop by default while installing Windows OS are called standard icons. The standard icons available in all Windows OS are My Computer, Documents and Recycle Bin.

19. **Control flow statements:** Program statements that cause such jumps are called as "Control flow". The basics of control structures such as "Selection", "Iteration" and "Jump" statement.

20. Setw()manipulator sets the width of the field assigned for the output. The field width determines the minimum number of characters to be written in output. **Syntax :** setw(number of characters)

21. Polymorphism is the ability of a message or function to be displayed in more than one form.

22. Operator that are not overloaded are follows

   (i)   scope operator (::)

   (ii)   sizeof

   (iii)   member selector (.)

   (iv)   member pointer selector. (*)

   (v)   ternary operator (?:)

23. Phishing is a term used to describe a malicious individual or group of individuals who scam users by sending e-mails or creating web pages that are designed to collect an individual's online bank, credit card, or other login information.

24. computer science16

PART - III

25. **Given : 101110101_2**

   Octal Equivalent :

$$= \overline{101} \; \overline{110} \; \overline{101}$$
$$\quad\;\; \downarrow \quad\;\; \downarrow \quad\;\; \downarrow$$
$$\quad\;\; 5 \quad\;\; 6 \quad\;\; 5$$

$$= 565_8$$

   Hexadecimal Equivalent :

$$= \overline{10} \; \overline{1110} \; \overline{101}$$
$$\quad\;\; \downarrow \quad\;\; \downarrow \quad\;\; \downarrow$$
$$\quad\;\; 1 \quad\;\; 7 \quad\;\; 5$$

$$= 175_{16} \;;\; 10110101_2 = 373_{10} = 565_8 = 175_{16}$$

26. The various key features are given below

   (i)   User Interface

   (ii)   File Management

   (iii)   Memory Management

   (iv)   Fault Tolerance

   (v)   Process Management

   (vi)   Security Management.

27. A problem can involve a lot of details. Several of these details are unnecessary for solving the problem. Only a few details are essential. Ignoring or hiding unnecessary details and modeling an entity only by its essential properties is known as abstraction.

28. A function that calls itself is known as recursive function. And, this technique is known as recursion.

29. An array of strings is a two-dimensional character array. The size of the first index (rows) denotes the number of strings and the size of the second index (columns) denotes the maximum length of each string. Usually, array of strings are declared in such a way to accommodate the null character at the end of each string. For example, the 2-D array has the declaration:

char Name[6][10];

30. **Types of constructors :** There are different types of constructors.

   (i) **Default Constructors :** A constructor that accepts no parameter is called default constructor. For example in the class Data, Data ::Data() is the default constructor.

   (ii) **Parameterized Constructors :** A constructor which can take arguments is called parameterized constructor .This type of constructor helps to create objects with different initial values.

      Example : Data :: Data(int,int);

   (iii) **Copy Constructors :** A constructor having a reference to an already existing object of its own class is called copy constructor. It is usually of the form Data (Data&), where Data is the class name.

31.

Private Visibility Mode	Protected Visibility Mode	Public Visibility Mode
When a base class is inherited with private visibility mode the public and protected members of the base class become 'private' members of the derived class.	When a base class is inherited with protected visibility mode the protected and public members of the base class become 'protected members' of the derived class.	When a base class is inherited with public visibility mode, the protected members of the base class will be inherited as protected members of the derived class and the public members of the base class will be inherited as public members of the derived class.

32. With the objectives of spreading Tamil to the entire world through internet, Tamil Virtual University was established on 17th February 2001 by the Govt. of Tamilnadu. Now, this organisation functions with the name of "Tamil Virtual Academy': It offers different courses in Tamil language, Culture, heritage etc., from kindergarten to under graduation level.

33.
```
#include<iostream>
using namespace std;
int main ()
{
int i, sum=0;
for(i=1; i<=10; i++)
{
        sum=sum + i;
}
cout<<"The sum of 1 to 10 is"<<sum;
return 0;
}
```
Output:

The sum of 1 to 10 is 55

PART - IV

34.**(a) (i)** **Inkjet Printers:**

   (a) Inkjet Printers use colour cartridges which combined Magenta, Yellow and Cyan inks to create color tones. A black cartridge is also used for monochrome output. Inkjet printers work by spraying ionised ink at a sheet of paper.

   (b) They use the technology of firing ink by heating it so that it explodes towards the paper in bubbles or by using piezoelectricity in which tiny electric currents controlled by electronic circuits are used inside the printer to spread ink in jet speed.

   (c) An Inkjet printer can spread millions of dots of ink at the paper every single second.

   (ii) **Multimedia Projectors:**

   (a) Multimedia projectors are used to produce computer output on a big screen.

   (b) These are used to display presentations in meeting halls or in classrooms.

(iii)　Bar Code / QR Code Reader:

(a)　A Bar code is a pattern printed in lines of different thickness. The Bar code reader scans the information on the bar codes transmits to the Computer for further processing.

(b)　The system gives fast and error free entry of information into the computer.

QR (Quick response) Code: The QR code is the two dimension bar code which can be read by a camera and processed to interpret the image.

(OR)

(b)　Circulate (A, B, C)

-- **inputs :** A, B, C are real numbers or an integers, $A \neq 0$, $B \neq 0$, $C \neq 0$

-- **outputs** : t1:= B; t2:=C such that

B:=A; C:=t1; A:= t2;

35.**(a)**　A Microprocessor's performance depends on the following characteristics:

(i)　Clock speed,

(ii)　Instruction set,

(iii)　Word size

(i)　Clock Speed : Every microprocessor has an internal clock that regulates the speed at which it executes instructions. The speed at which the microprocessor executes instructions is called clock speed. Clock speed is measured in MHz (Mega Hertz) or in GHz (Giga Hertz).

(ii)　Instruction set : A command which is given to a computer to perform an operation on data is called an instruction. Basic set of machine level instructions that a microprocessor is designed to execute is called as an instruction set. This instruction set carries out the following types of operations:

1.　Data transfer

2.　Arithmetic operations

3.　Logical operations

4.　Control flow

5.　Input/output.

(iii)　Word Size : The number of bits that can be processed by a processor in a single instruction is called its word size. Word size determines the amount of RAM that can be accessed by a microprocessor at one time and the total number of pins on the microprocessor. Total number of input and output pins in turn determines the architecture of the microprocessor.

(OR)

(b)　In loop, if the condition checked in the beginning of execution of the loop is called entry control loop. for loop and while loop are the entry control loop because the text expression is evaluated before entering into a loop.

While loop : A while loop is a control flow statement that allows the loop statements to be executed as long as the condition is true. The while loop is an entry-controlled loop because the test-expression is evaluated before the entering into a loop.

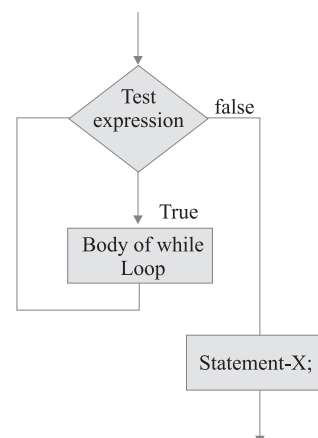**The while loop syntax is :**

while (Text expression)

{

　　Body of the loop;

}

Statement-x;

The control flow and flow chart of the while loop is shown below :

In while loop, the test expression is evaluated and if the test expression result is true, then the body of the loop is executed and again the

control is transferred to the while loop. When the test expression result is false the control is transferred to statement-x.

Example :

```
#include<iostream>
using namespace std;
int main ()
{
int i=1, sum=0;
while(i<=10)
    {
        sum=sum+1;
        i++;
    }
cout<<"The sum of 1 to 10 is"<<sum;
return 0;
}
```

Output : The sum of 1 to 10 is 55

36. **(a)**

(i) $1101010_2 + 101101_2$

$$
\begin{array}{r}
1101010 \\
+101101 \\
\hline
10010111 \\
\hline
\end{array}
$$

$= 10010111_2$

(ii) $1101011_2 - 111010_2$

$$
\begin{array}{r}
1101011 \\
-111010 \\
\hline
110001 \\
\hline
\end{array}
$$

$= 110001_2$

(OR)

(b) Call by value method copies the value of an actual parameter into the formal parameter of the function. In this case, changes made to formal parameter within the function will have no effect on the actual parameter.

Example :

```
#include<iostream>
```

```
using namespace std;
void display(int x)
{
    x=x*x;
    cout<<"\n\nThe Value inside display
                function (x*x):"<<x;
}
int main()
{
    int a;
    cout<<"\nExample : Function call by
                value:";
    cout<<"\n\nEnter the Value for A :";
    cin>>a;
    display(a);
    cout<<"\n\nThe Value inside main
                function"<<a;
    return(0);
}
```

Output:

Function call by value

Enter the Value for A:5

The Value inside display function (a * a) : 25

The Value inside main function 5

37. **(a)** For creating and executing a C++ program, one must follow four important steps.

(i) **Creating Source code :** Creating includes typing and editing the valid C++ code as per the rules followed by the C++ Compiler

(ii) **Saving source code with extension .cpp :** After typing, the source code should be saved with the extension .cpp

(iii) **Compilation :** This is an important step in constructing a program. In compilation, compiler links the library files with the source code and verifies each and every line of code. If any mistake or error is found, it will inform you to make corrections. If there are no errors, it translates the source code into machine readable object file with an extension .obj

(iv) Execution : This is the final step of construction of a C++ Program. In this stage, the object file becomes an executable file with extension .exe. Once the program becomes an executable file, the program has an independent existence. This means, you can run your application without the help of any compiler or IDE.

(OR)

(b) Advantages of OOP:

(i) Re-usability: "Write once and use it multiple times" you can achieve this by using class.

(ii) Redundancy: Inheritance is the good feature for data redundancy. If you need a same functionality in multiple class you can write a common class for the same functionality and inherit that class to sub class.

(iii) Easy Maintenance: It is easy to maintain and modify existing code as new objects can be created with small difference to existing ones.

(iv) Security: Using data hinding and abstraction only necessary data will be provided thus maintains the security of data.

38. **(a)**

L. No.	Error Code	Correct Code
1	~INCLUDE (iostream)	#include <iostream>
2	~include<string.h>	#include<string.h>
6	PUBLIC;	Public:
8	VIOD getstrings(char str[]):	void getstring(char str[])
10	strcpy(s, str):	strcpy(s,str);
13	}:	};
16	strcat(s:ob:s);	strcat(s,ob.s);
17	cout>>"\n concatenated string is:"<<s;	cout<<"\n concatenated string is:"<<s;
19	int main[ ]	int main( )
21	string ob1, ob2;	strings ob1, ob2;
23	cout>>"\n Enter First String:";	cout<<"\n Enter First String:";
24	cin<<string1;	cin>>string1;
27	cin<<string2:	cin>>string2;
31	};	}

(OR)

(b) Output:

Enter the age:

18

Enter the height:

160.5

Enter the weight:

46.5

The values entered for Age, height and weight are

18   160.5   46.5

❀❀❀❀