11th STD

PUBLIC EXAMINATION MARCH - 2024

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. Which generation of computer used IC's?
   (a) Third generation   (b) First generation
   (c) Fourth generation   (d) Second generation

2. Omitting details inessential to the task and representing only the essential features of the task is known as :
   (a) Composition   (b) Specification
   (c) Decomposition   (d) Abstraction

3. How many times the loop is iterated?
   i : = 0
   while i ≠ 5
   i ; = i +1
   (a) 6   (b) 4   (c) 0   (d) 5

4. Which of the following is the scope operator?
   (a) >   (b) : :   (c) &   (d) %

5. Distributing unwanted e-mail to others is called _____.
   (a) scam   (b) fraud   (c) spoofing   (d) spam

6. In C++ _____ is used for pointer to a variable.
   (a) −   (b) +   (c) ÷   (d) *

7. Which of the following is the Entry Control loop?
   (a) if   (b) for
   (c) do-while   (d) switch

8. Legal recognition for transactions are carried out by :
   (a) Electronic Data Transfer
   (b) Electronic Data Interchange
   (c) Data Interchange
   (d) Electronic Data Exchange

9. The mechanism by which the data and function are bound together into a single unit is known as :
   (a) Abstraction   (b) Polymorphism
   (c) Inheritance   (d) Encapsulation

10.
```cpp
#include<iostream>
using namespace std;
int main()
{
    int i=1, sum=0;
    while(i<=10)
    {
        sum = sum+i;
        i++;
    }
    cout<<sum;
    return 0;
}
```
   The output for the above snippet is:
   (a) 55   (b) 54   (c) 51   (d) 50

11. The shortcut key used to rename a file in Windows.
   (a) F5   (b) F2   (c) F6   (d) F4

12. Which of the following constructor is executed for the following prototype?
    add display (add &); // add is a class name
   (a) Copy Constructor
   (b) Default Constructor
   (c) Non-Parameterized Constructor
   (d) Parameterized Constructor

13. Which refers to the number of bits processed by a computer's CPU?
   (a) Word length   (b) Byte
   (c) Bit   (d) Nibble

14. Interactive Operating System provides :
   (a) Real Time Processing
   (b) Data Distribution
   (c) Security Management
   (d) Graphics User Interface

15. Which of the following is a CISC processor?
   (a) Pentium III   (b) Intel P6
   (c) Pentium IV   (d) AMD K6

PART - II

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

16. Distinguish Primary and Secondary Memory.

17. $(1324)_8$ - convert to equivalent Decimal number.

18. What is Multi user operating system?

19. Write a short note on const keyword with example.

20. What are the importance of void data type?

21. What are Warez?

22. List the search engines supported by Tamil Language.

23. Define an algorithm.

24. Write the output of the following program.
```
#include<iostream>
using namespace std;
int main()
{
    int i;
    for(i=0;i<8;i++)
    cout<<i<<endl;
    return 0;
}
```

PART - III

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

25. Write a note on Recycle bin.

26. What are the points to be noted while deriving a class?

27. How is state represented in algorithms?

28. Give the Truth Table of XOR gate.

29. What is the difference between isupper( ) and toupper( ) functions?

30. Differentiate - CD and DVD.

31. Write the significant features of monitor.

32. What is an array? Write its types.

33. Write a C++ program to display number from 5 to 1 using do-while loop.

PART - IV

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

34. (a) Explain the basic components of a computer with a neat diagram.

(OR)

(b) Explain the concept of a Distributed Operating System along with its advantages.

35. (a) Perform binary addition for the follwoing.

(i) $(-21)_{10} + (5)_{10}$

(ii) $(-12)_{10} + (15)_{10}$

(OR)

(b) What is function overloading? What are the rules for function overloading?

36. (a) Explain about the types of ROM.

(OR)

(b) Write the differences between if-else and switch statement.

37. (a) What is an output unit? Explain any three output devices.

(OR)

(b) Write the output of the following program:
```
#include<iostream>
 using namespace std;
class student
{
        int rno, marks;
        public:
        student(int r,int m)
    {
        cout<<"Constructor "<<endl;
        rno=r;
        marks=m;
    }
        void printdet()
    {
        marks=marks+30;
        cout<<"Roll no : "<<rno<<"\n";
        cout<<"Marks : "<<marks<<endl;
    }
};
 int main()
{
        student s(14,70);
        s.printdet();
        cout<< "Back to Main";
        return 0;
}
```

38. (a) Explain the different types of inheritance.

(OR)

(b) Debug the following C++ program.
Output :
Total area : 35

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Program:
```
%include<iostream>
using namespace std:
CLASS Shape
{
    Private ( )
        int count
    Protected;
        int width;
        int height;
    PUBLIC;
        Void setwidth [int w]
        {
        width=w;
        };
        void setheight (int h)
        {
        height=h;
        }
    }
Class rectangle : : Public Shape
{
Public
        int getarea [ ]
        {
            return (width * height);
        };
    }
    int MAIN( )
    {
        rectangle rect :
        rect. setwidth(5);
        rect.setheight(7);
        cout>>"Total area : "<<rect.getarea( )
                            <<endl;
        return 0;
    };
```

ANSWERS

PART - I

1. (a) Third generation
2. (d) Abstraction
3. (d) 5
4. (b) : :
5. (d) spam
6. (d) *
7. (b) for
8. (b) Electronic Data Interchange
9. (d) Encapsulation
10. (a) 55
11. (b) F2
12. (a) Copy Constructor
13. (a) Word length
14. (d) Graphics User Interface
15. (a) Pentium III

PART - II

16.

Primary Memory	Secondary Memory
It is used to temporarily store the programs and data when the instructions are ready to execute.	It is used to store the data permanently.
It is volatile, the content is lost when the power supply is switched off. Eg. RAM.	It is non-volatile, the content is available even after the power supply is switched off. Eg. ROM, CD-ROM, DVD ROM.

17. $(1324)_8$ Equivalent Decimal number:

Weight	512	64	8	1
Positional notation	8^3	8^2	8^1	8^0
Given number	1	3	2	4

$(1324)_8 = 512 \times 1 + 64 \times 3 + 8 \times 2 + 1 \times 4$

$= 512 + 192 + 16 + 4$

$(1324)_8 = (724)_{10}$

18. **Multi-user Operating Systems :**
   (i) It is used in computers and laptops that allow same data and applications to be accessed by multiple users at the same time.
   (ii) The users can also communicate with each other. Windows, Linux and UNIX are examples for multi-user Operating System.

19. **Const Keyword:** Const is the keyword used to declare a constant. const keyword modifies / restricts the accessibility of a variable. So, it is known as Access modifier.

Example: int num = 100;

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20. **Void type has two important purposes:**
    (i) To indicate the function does not return a value
    (ii) To declare a generic pointer.

21. **Warez :** Commercial programs that are made available to the public illegally are often called warez.

22. (i) Google
    (ii) Bing
    (iii) yahoo.

23. An algorithm is a sequence of instructions to accomplish a task or solve a problem.

24. **Output :**
    0
    1
    2
    3
    4
    5
    6
    7

PART - III

25. **Recycle bin** is a special folder to keep the files or folders deleted by the user, which means you still have an opportunity to recover them. The user cannot access the files or folders available in the Recycle bin without restoring it. To restore file or folder from the Recycle Bin
    (i) Open Recycle bin.
    (ii) Right click on a file or folder to be restored and select Restore option from the pop-up menu.
    (iii) To restore multiple files or folders, select Restore all items.
    (iv) To delete all files in the Recycle bin, select Empty the Recycle Bin.

26. While defining a derived class, the derived class should identify the class from which it is derived. The following points should be observed for defining the derived class.
    (i) The keyword class has to be used
    (ii) The name of the derived class is to be given after the keyword class.
    (iii) A single colon(:)

    (iv) The type of derivation (the visibility mode), namely private, public or protected. If no visibility mode is specified ,then by default the visibility mode is considered as private.
    (v) The names of all base classes(parent classes) separated by comma.

27. (i) State is a basic and important abstraction.
    (ii) Computational processes have state. A computational process starts with an initial state. As actions are performed, its state changes. Its ends with a final state.
    (iii) The state at any point of execution is simply the values of the variables at that point.

28. **Truth Table of XOR gate:**

A	B	A⊕B
0	0	0
0	1	1
1	0	1
1	1	0

29.

isupper()	toupper()
This function is used to check the given character is upper case.	This function is used to convert the given character into its uppercese.
This function will return 1 if true otherwise 0.	This function will return the uppercase equivalent of the given character.
Example : isupper('a') will return 0	**Example :** toupper('a') will return 'A'

30.

		CD	DVD
(i)		Expansion is Compact-Disk	Expansion is Digital Versatile Disc.
(ii)		A standard CD can store about 700 MB of Data.	A standard DVD can hold 4.7 GB of data.
(iii)		CD players cannot play DVDs.	DVD players can play CDs.
(iv)		It stores upto 80 min of audio.	It can range from 4.7 GB to 17.08 GB.

31. **Significant features of monitor:**
    (i) Monitor is the most commonly used output device to display the information. It looks like a TV.
    (ii) Pictures on a monitor are formed with picture elements called PIXELS.
    (iii) Monitors may either be Monochrome which display text or images in Black and White or can be color, which display results in multiple colors.
    (iv) There are many types of monitors available such as CRT (Cathode Ray Tube), LCD (Liquid Crystal Display) and LED (Light Emitting Diodes).
    (v) The video graphics card helps the keyboard to communicate with the screen.
    (vi) It acts as an interface between the computer and display monitor.

32. "An array is a collection of variables of the same type that are referenced by a common name".

    There are different types of arrays used in C++. They are:
    (i) One-dimensional arrays
    (ii) Two-dimensional arrays
    (iii) Multi-dimensional arrays

33.
```
#include<iostream>
using namespace std;
int main ( )
{
int n = 5;
do
{
cout<<n<<", ";
n − −;
}while (n>0);
}
```
Output
5 4 3 2 1

PART - IV

34. **(a) Components of a Computer :**
    The computer is the combination of hardware and software. Hardware is the physical component of a computer like motherboard, memory devices, monitor, keyboard etc., while software is the set of programs or instructions.

Both hardware and software together make the computer system to function. Every task given to a computer follows an Input-process - output cycle (IPO cycle).


(i) **Input unit :** Input unit is used to feed any form of data to the computer, which can be stored in the memory unit for further processing. **Example :** keyboard, mouse etc.

(ii) **Central Processing Unit :** CPU is the major component which interprets and executes software instructions. It also control the operation of all other components such as memory, input and output units.

(iii) **Arithmetic and Logic Unit :** The ALU is a part of the CPU where various computing functions are performed on data. The ALU performs arithmetic operations such as addition, subtraction, multiplication, division and logical operations.

Components of a Computer
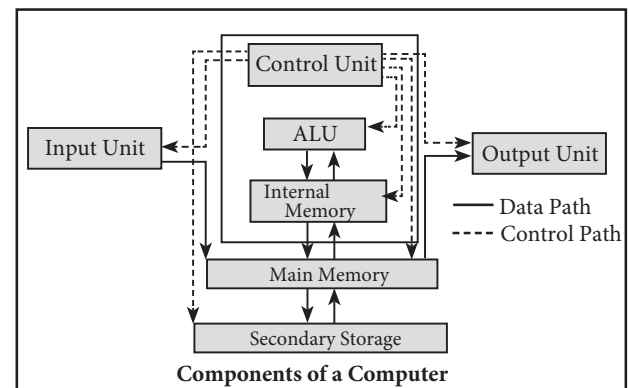
(iv) **Control Unit :** The control unit controls the flow of data between the CPU, memory and I/o devices. It also controls the entire operation of a computer.

(v) **Output Unit :** An output unit is any hardware component that conveys information to users in an understandable form. Example : Monitor, Printer etc.

(vi) **Memory Unit :** The Memory Unit is of two types which are primary memory and secondary memory. The primary memory is used to temporarily store the programs and data when the instructions are ready to execute. The secondary memory is used to store the data permanently.

(OR)

(b) The Distributed Operating System is used to access shared data and files that reside in any machine around the world using internet/intranet. The users can access as if it is available on their own computer. The advantages of distributed Operating System are as follows

(i) A user at one location can make use of all the resources available at another location over the network.

(ii) Many computer resources can be added easily in the network

(iii) Improves the interaction with the customers and clients.

(iv) Reduces the load on the host computer.

35. **(a) (i)** $(-21)_{10} + (5)_{10}$

-21	$= 10101_2$	2	21	
1's complement	$= 00010101$	2	10 – 1	
2's complement	$= 11101010$	2	5 – 0	
		2	1 – 0	
	$+ 1$			
	11101011			

$5_{10} = 101_2$

$(-21)_{10} + (5)_{10}$ $= 11101011$
                                    00000101

-16_{10} Result $= 11110000$

(ii) $(-12)_{10} + (15)_{10}$

Binary addition of -12 and 15

12_{10} $= 00001100$
1's complement $= 11110011$
Add 1 to LSB $=$ $+1$
2's complement $= 11110100$

$(-12)_{10}$	$=$	11110100	2	15
$(15)_{10}$	$=$	00001111	2	7 – 1
			2	3 – 1
	$=$	100000011		1 – 1

(OR)

(b) **Function overloading:** The ability of the function to process the message or data in more than one form is called as function overloading.

Rules for function overloading :

(i) The overloaded function must differ in the number of its arguments or data types.

(ii) The return type of overloaded functions are not considered for overloading same data type.

(iii) The default arguments of overloaded functions are not considered as part of the parameter list in function overloading.

36. **(a)** **Types of ROM:**

Read-only memory (ROM) :

(i) Read only memory refers to special memory in a computer with pre-recorded data at manufacturing time which cannot be modified. The stored programs that start the computer and perform diagnostics are available in ROMs.

(ii) ROM stores critical programs such as the program that boots the computer. Once the data has been written onto a ROM chip, it cannot be modified or removed and can only be read.

(iii) ROM retains its contents even when the computer is turned off. So, ROM is called as a non-volatile memory.

Programmable Read-Only Memory (PROM) :

(i) Programmable read-only memory is also a non-volatile memory on which data can be written only once. Once a program has been written onto a PROM, it remains there forever.

(ii) PROM is manufactured as a blank memory, whereas a ROM is programmed during the manufacturing process itself. PROM programmer or a PROM burner is used to write data to a PROM chip. The process of programming a PROM is called burning the PROM.

Erasable Programmable Read-Only Memory (EPROM)

(i) Erasable Programmable Read-Only Memory is a special type of memory which serves as a PROM. The content can be erased using ultraviolet rays.

(ii) An EPROM differs from a PROM. PROM can be written only once and cannot be erased.

(iii) EPROMs are used widely in personal computers because they enable the manufacturer to change the contents of the PROM to replace with updated versions or erase the contents before the computer is delivered.

Electrically Erasable Programmable Read-Only Memory (EEPROM)

(i) Electrically Erasable Programmable Read-Only Memory can be erased by exposing it to an electrical charge.

(ii) Like other types of PROM, EEPROM retains its contents even when the power is turned off. Comparing with all other types of ROM, EEPROM is slower in performance.

(OR)

(b)

S. No	if-else	Switch
1.	Expression inside if statement decide whether to execute the if block or under else block.	expression inside switch statement decide which case to execute.
2.	An if-else statement uses multiple statements for multiple choices.	switch statement uses single expression for multiple choices.
3.	If-else statement checks for equality as well as for logical expression.	switch checks only for equality.
4.	The **if** statement evaluates integer, character, pointer or floating-point type or Boolean type.	switch statement evaluates only character or a integer data type.
5.	If the condition is false the else block statements will be executed.	If the condition is false then the default statements are executed.

37. **(a) Output Unit :** An output unit is any hardware component that conveys information to users in an understandable form. Example : Monitor, Printer etc.

Output Devices :

(i) **Monitor :** Monitor is the most commonly used output device to display the information. It looks like a TV. Monitors may either be Monochrome which display text or images in Black and White or can be color, which display results in multiple colors. There are many types of monitors available such as CRT (Cathode Ray Tube), LCD (Liquid Crystal Display) and LED (Light Emitting Diodes). The video graphics card helps the keyboard to communicate with the screen. It acts as an interface between the computer and display monitor.

(ii) **Plotter :** Plotter is an output device that is used to produce graphical output on papers. It uses single color or multi color pens to draw pictures.

(ii) **Printers :** Printers are used to print the information on papers. Printers are divided into two main categories:
- Impact Printers
- Non Impact printers

Impact Printers : These printers print with striking of hammers or pins on ribbon.

For example, Dot Matrix printers and Line matrix printers are impact printers.

Non-Impact Printers : These printers do not use striking mechanism for printing. For example, Laser printers and Inkjet printers are non-impact printers.

(OR)

(b) **Output :**
Constructor of class student
Name : Bharathi
Roll no : 14
Marks : 100
Back in main

38. **(a)** **Types of Inheritance:** There are different types of inheritance viz., Single Inheritance, Multiple inheritance, Multilevel inheritance, hybrid inheritance and hierarchical inheritance.
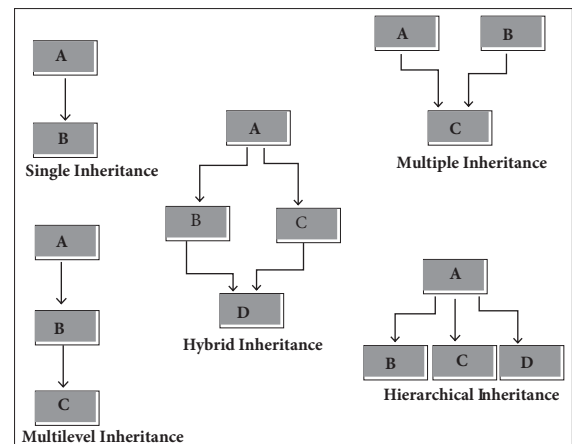
(i) **Single Inheritance :** When a derived class inherits only from one base class, it is known as as single inheritance

(ii) **Multiple Inheritance :** When a derived class inherits from multiple base classes it is known as multiple inheritance

(iii) **Hierarchical inheritance :** When more than one derived classes are created from a single base class , it is known as Hierarchical inheritance.

(iv) **Multilevel Inheritance :** The transitive nature of inheritance is itself reflected by this form of inheritance. When a class is derived from a class which is a derived class – then it is referred to as multilevel inheritance.

(v) **Hybrid inheritance :** When there is a combination of more than one type of inheritance, it is known as hybrid inheritance. Hence, it may be a combination of Multilevel and Multiple inheritance or Hierarchical and Multilevel inheritance or Hierarchical, Multilevel and Multiple inheritance.

(OR)

(b)

```cpp
#include <iostream>
using namespace std;
class Shape
{
    private:
        int count;
    protected:
        int width, height;
public:
        void setWidth(int w)
        {
        width = w;
        }
void setHeight(int h)
{
height = h;
}
};
class Rectangle: public Shape
{
public:
int getArea()
{
return (width * height);
}
};
int main()
{
Rectangle Rect;
Rect.setWidth(5);
Rect.setHeight(7);
// Print the area of theobject.
cout<< "Total area: "<<Rect.getArea() <<endl;
return 0;
}
```

Output:

Total area: 35.

❀ ❀ ❀ ❀