11th STD

INSTANT SUPPLEMENTARY EXAM - JULY 2023
COMPUTER SCIENCE (with Answers)

Reg. No.

TIME ALLOWED : 3.00 Hours]   **PART - III**   **[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 shortcut key is used to cut a file or folder?
   (a) Ctrl + Alt + C   (b) Ctrl + Alt + X
   (c) Ctrl + C   (d) Ctrl + X

2. 2^{40} is referred as :
   (a) Kilo   (b) Tera   (c) Peta   (d) Zetta

3. What is the smallest size of data represented in a CD?
   (a) Blocks   (b) Sectors
   (c) Pits   (d) Tracks

4. Operating system provides how many levels of securities to the user?
   (a) 2   (b) 3   (c) 4   (d) 1

5. Which is volatile memory?
   (a) ROM   (b) PROM   (c) RAM   (d) EPROM

6. Using the following recursive definition

$$a^n = \begin{cases} 1 & \text{if } n = 0 \\ a \times a^{n-1} & \text{otherwise} \end{cases}$$

how many multiplications are needed to calculate a^{10}?
   (a) 11   (b) 10   (c) 9   (d) 8

7. Which of the following operator is extraction operator in C++?
   (a) >>   (b) <<   (c) <>   (d) ^^

8. How many times the following loop will execute?
   for (int i=0; i<5; i++)
   (a) 0   (b) 5   (c) 4   (d) 6

9. If two strings are equal, then strcmp() function returns which value?
   (a) 0   (b) −1   (c) +1   (d) =

10. By default, a string ends with which character?
   (a) \o   (b) \t   (c) \n   (d) \b

11. A constructor that accepts no parameter is called as :
   (a) parameterized constructor
   (b) copy constructor
   (c) default constructor
   (d) non-parameterized constructor

12. Which is the first Tamil programming language?
   (a) Thamizpori   (b) Ezhil
   (c) Kamban   (d) Vani

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

14. Inheritance is a process of creating new class from :
   (a) Base class   (b) Abstract
   (c) Derived class   (d) Function

15. Which of the following is the identifiable entity with some characteristics and behaviour?
   (a) Class   (b) Object
   (c) Structure   (d) Member

PART - II

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

16. List the encoding systems that represent characters in memory.

17. What is a program counter?

18. What is an invariant?

19. Write about strlen( ) function.

20. What are Warez?

21. What is abstraction?

22. What are called Standard icons?

23. Define class.

24. Convert the following if-else statement into conditional statement.
   if (marks > = 60)
       Grade = 'A';
   else
       Grade = 'B';

PART - III

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

25. Differentiate - Break and Continue statement.

26. Write a note on Recycle bin.

27. What do you mean by Overriding?

28. List out the key features of operating system.

29. What is called anonymous structure? Give an example.

30. Differentiate - Cold booting and Warm booting.

31. Write a note on binary number system.

[1]

32. List out the features of procedural programming.

33. Convert the following Octal numbers into Binary numbers.

(i) 6137   (ii) 245   (iii) 472

PART - IV

Note : Answer **all** the questions. $5 \times 5 = 25$

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

(OR)

(b) List out the uses of operating system.

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

(OR)

(b) (i) Add $1101010_2 + 101101_2$

(ii) Subtract $1101011_2 - 111010_2$

36. (a) Explain control statements with suitable examples.

(OR)

(b) Explain the main features of Object Oriented Programming.

37. (a) Explain the different visibility mode through pictorial representation.

(OR)

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

(ii) State the rules for Operator overloading?

38. (a) (i) What is Parameter and list its types.

(ii) Write a short note on pow( ) function in C++.

(OR)

(b) Debug the following C++ program:

Program:

```
%include (iostream)
using namespace std
int main [ ]
{
int n,num, digit, rev =0
Cout>>"Enter a positive number: ";
Cin>>num;
n =num:
while (num)
{
digit=num%10
rev=(rev *10)+ digit;
num=num/10
}
cout<<" The reverse of the number is:
                                << rev <<endl;
```

```
if (n == rev);
Cout<<" The number is a palindrome ;
else :
cout>> The number is not a palindrome";
return 0;
}
}
```

Output 1

Enter a positive number: 1221
The reverse of the number is: 1221
The number is a palindrome.

Output 2

Enter a positive number: 1234
The reverse of the number is: 4321
The number is not a palindrome

❀ ❀ ❀ ❀

ANSWERS

PART - I

1. (d) Ctrl + X
2. (b) Tera
3. (c) Pits
4. (b) 3
5. (c) RAM
6. (c) 9
7. (a) >>
8. (b) 5
9. (a) 0
10. (a) \o
11. (c) default constructor
12. (b) Ezhil
13. (b) spam
14. (a) Base class
15. (b) Object

PART - II

16. (i) BCD – Binary Coded Decimal.

(ii) EBCDIC – Extended Binary Coded Decimal Interchange Code.

(iii) ASCII – American Standard Code for Information Interchange.

(iv) Unicode.

(v) ISCII - Indian Standard Code for Information Interchange.

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. An expression involving variables, which remains unchanged by an assignment to one of these variables, is called an invariant of the assignment.

19. The strlen( ) takes a null terminated string as its argument and returns its length. The length does not include the null(\0) character.

    Example :

       name = "vijay"

       strlen(name); [length of the name = 5].

20. **C**ommercial programs that are made available to the public illegally are often called warez.

21. 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.

22. 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.

23. It can also be defined as a template or blueprint representing a group objects that share common properties and relationship.

24. Grade = (marks>=60)? A : B ;

PART - III

25.

Break	Continue
Break is used to terminate the execution of the loop.	Continue is not used to terminate the execution of loop.
It breaks the iteration	It skips the iteration
When this statements is executed, control will come out from the loop and executes the statement immediate after loop.	When this statement is executed, it will not come out of the loop but moves/jumps to the next iteration of loop.
Break is used with loops as well as switch case.	Continue is only used in loops, it is not used in switch case.

26. 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.

27. When a derived class member function has the same name as that of its base class member function ,the derived class member function shadows/hides the base class's inherited function .This situation is called function overriding.

28. 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.

29. A structure without a name/tag is called anonymous structure.

    Example:

       struct
       {
       long rollno;
       int age;
       float weight;
       } student;

    The student can be referred as reference name to the above structure and the elements can be accessed like student.rollno, student.age and student weight

30.

Cold Booting	Warm Booting
When the system starts from initial state i.e. it is switched on, we call it cold booting or Hard Booting.	When the user presses the Power button, the instructions are read from the ROM to initiate the booting process.

When the system restarts or when Reset button is pressed, we call it Warm Booting or Soft Booting.	The system does not start from initial state and so all diagnostic tests need not be carried out in this case. There are chances of data loss and system damage as the data might not have been stored properly.

31. **Binary number system:**

(i)   There are only two digits in the Binary system, namely, 0 and 1. The numbers in the binary system are represented to the base 2 and the positional multipliers are the powers of 2.

(ii) The left most bit in the binary number is called as the Most Significant Bit (MSB) and it has the largest positional weight.

(iii) The right most bit is the Least Significant Bit (LSB) and has the smallest positional weight.

32. **Features of procedural programming:**

(i)   Programs are organized in the form of subroutines or sub programs.

(ii) All data items are global.

(iii) Suitable for small sized software application.

(iv) Difficult to maintain and enhance the program code as any change in data type needs to be propagated to all subroutines that use the same data type. This is time consuming.

(v)   Example: FORTRAN and COBOL.

33. (i) 6137_8

```
  6     1     3     7
  ↓     ↓     ↓     ↓
 110    1    11    111
```

$6137_8 = 110111111_2$

(ii) 245_8

```
  2     4     5
  ↓     ↓     ↓
 10    100   101
```

$245_8 = 10100101_2$

(iii) 472_8

```
  4     7     2
  ↓     ↓     ↓
 100   111   010
```

$472_8 = 100111010_2$

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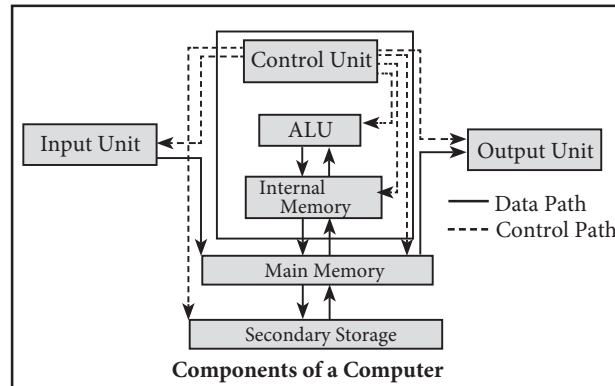
(iv) **Control Unit :** The control unit controls the flow of data between the CPU, memory and I/o devices. It also controls the entire operation of a computer.

(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. The Primary Memory is volatile, that is, the content is lost when the power supply is switched off. The Random Access Memory (RAM) is an example of a main memory. The Secondary memory is non volatile, that is, the content is available even after the power supply is switched off. Hard disk, CD-ROM and DVD ROM are examples of secondary memory.

**(OR)**

**(b)** The main use of operating system is

(i)     To ensure that a computer can be used to extract what the user wants it do.

(ii)    Easy interaction between the users and computers.

(iii)   Starting computer operation automatically when power is turned on(Booting).

(iv)    Controlling input & output devices.

(v)     Manage the utilisation of main memory.

(vi)    Providing security to user programs.

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) (i)** $1101010_2 + 101101_2$

```
  1101010
+  101101
  ─────────
 10010111
```

$= 10010111_2$

(ii) $1101011_2 - 111010_2$

```
  1101011
-  111010
  ─────────
   110001
```

$= 110001_2$

36. **(a)** Control statements are statements that alter the sequence of flow of instructions. If the statements are executed sequentially, the flow is called as sequential flow. In some situations, if the statements alter the flow of execution like branching, iteration, jumping and function calls, this flow is called as control flow.

Sequence statement:

The sequential statement are the statements, that are executed one after another only once from top to bottom. These statement do not alter the flow of execution. These statement are called as sequential flow statements. They are always end with a semicolon (;).

If - else : In if-else statement, first the expression or condition is evaluated either true of false. If the result is true, then the statements inside true-block is executed and false-block is skipped. If the result is false, then the statement inside the false-block is executed i.e., the true-block is skipped.

```
if (rem==0)
    cout<< "\n The given number" <<num<<" is Even";
else
    cout<<"\n The given number"<<num<<" is Odd";
```

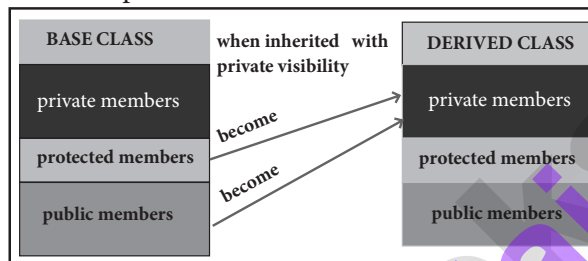| Statement 1 |
| :---: |
| ↓ |
| Statement 2 |
| ↓ |
| Statement 3 |

(OR)

(b) Important features of Object oriented programming:

(i) Emphasizes on data rather than algorithm.

(ii) Data abstraction is introduced in addition to procedural abstraction.

(iii) Data and its associated operations are grouped in to single unit.

(iv) Programs are designed around the data being operated

(v) Relationships can be created between similar, yet distinct data types

(vi) Example: C++, Java, VB.Net, Python etc.
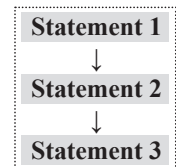
37. **(a)**

    (i)   **Visibility Modes :** An important feature of Inheritance is to know which member of the base class will be acquired by the derived class. This is done by using visibility modes. The accessibility of base class by the derived class is controlled by visibility modes. The three visibility modes are private, protected and public. The default visibility mode is private. Though visibility modes and access specifiers look similar, the main difference between them is Access specifiers control the accessibility of the members with in the class where as visibility modes control the access of inherited members with in the class.

    (ii)   **Private 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.

BASE CLASS	when inherited with private visibility	DERIVED CLASS
private members		private members
protected members	become	protected members
public members	become	public members

    (iii) **Protected Visibility Mode :** 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.

BASE CLASS	when inherited with protected visibility	DERIVED CLASS
private members		private members
protected members	become	protected members
public members	become	public members
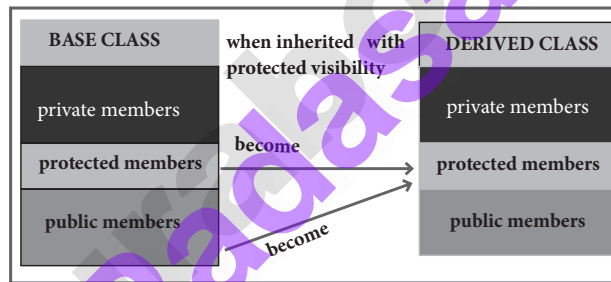
    (iv) **Public Visibility Mode :** When a base class is inherited with public visibility mode , the protected members of the base class will be inherited as protected members of the derived class and the public members of the base class will be inherited as public members of the derived class.

BASE CLASS	when inherited with public visibility	DERIVED CLASS
private members		private members
protected members	become	protected members
public members	become	public members
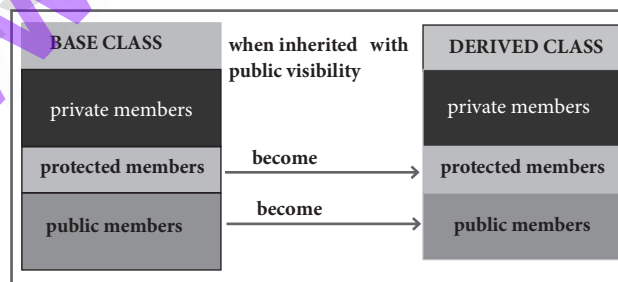
(OR)

(b) **(i)**   **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.

(ii) **Rules for Operator overloading :**

(i) Precedence and Associativity of an operator cannot be changed.

(ii) No new operators can be created, only existing operators can be overloaded.

(iii) Cannot redefine the meaning of an operator's procedure. You cannot change how integers are added. Only additional functions can be to an operator

(iv) Overloaded operators cannot have default arguments.

(v) When binary operators are overloaded, the left hand object must be an object of the relevant class.

38. **(a)**

(i) **Paramter and its types :**

   (i) Arguments or parameters are the means to pass values from the calling function to the called function.

   (ii) The variables used in the function definition as parameters are known as formal parameters.

   (iii) The constants, variables or expressions used in the function call are known as actual parameters.

(ii) **pow( ) function in C++ :**

The pow() function returns base raised to the power of exponent. If any argument passed to pow() is long double, the return type is promoted to long double. If not, the return type is double. The pow() function takes two arguments.

   (i) base- the base value

   (ii) exponent - exponent of the base.

(OR)

(b)

```
#include <iostream>
using namespace std;
int main()
{
int n,num, digit, rev =0;
cout<<"Enter a positive number: ";
cin>>num;
n =num;
while (num)
{
digit=num%10;
rev=(rev *10)+ digit;
num=num/10;
}
cout<<" The reverse of the number is: "<< rev <<endl;
if (n == rev)
cout<<" The number is a palindrome";
else
cout<<" The number is not a palindrome";
return 0;
}
```

Output 1

   Enter a positive number to reverse: 1234

   The reverse of the number is: 4321

   The number is not a palindrome

Output 2

   Enter a positive number to reverse: 1221

   The reverse of the number is: 1221

   The number is a palindrome

❀ ❀ ❀ ❀