

2023-24 II PUC ANNUAL EXAMINATION

COMPUTER SCIENCE

Instructions:

1. The question paper has five parts namely A, B, C, D and E. Answer all the five parts.
2. For part -A Questions only the first written answers will be considered for evaluation.

PART-A

I. Answer all questions. Each question carries 1 mark.

(20 X 1= 20)

- 1) Where is L1 cache located?
 - a) Inside the CPU
 - b) Outside the CPU
 - c) Inside the ALU
 - d) In the ROM
- 2) Boolean Algebra is also called _____
 - a) Linear algebra
 - b) Arithmetic algebra
 - c) **Switching algebra**
 - d) Binary algebra
- 3) The output of 2 input AND gate is High (1) when
 - a) One of the input is high
 - b) **Both the inputs are high**
 - c) Both the inputs are low
 - d) None of the above
- 4) Assertion (A) : A stack is a LIFO data structure.

Reasoning (R) : An ordered collection of items where insertion and deletion takes place at different ends.

- a) **A is true , R is false**
- b) A is true, and R is correct explanation of A
- c) A is false, R is false
- d) None of the above

5) _____ Operator is used to define member function outside the class.

- a) .
- b) ::
- c) ;
- d) *

6) A. The inline function is a compact function

B. Inline function runs faster than normal function.

C. Using inline function efficient code can be generated.

- a) A is correct but B is wrong
- b) A is wrong but C is correct
- c) B is wrong and C is wrong
- d) **All A, B, C are correct**

7) Constructor should be declared in _____

- a) Private
- b) **Public**
- c) Protected
- d) Local

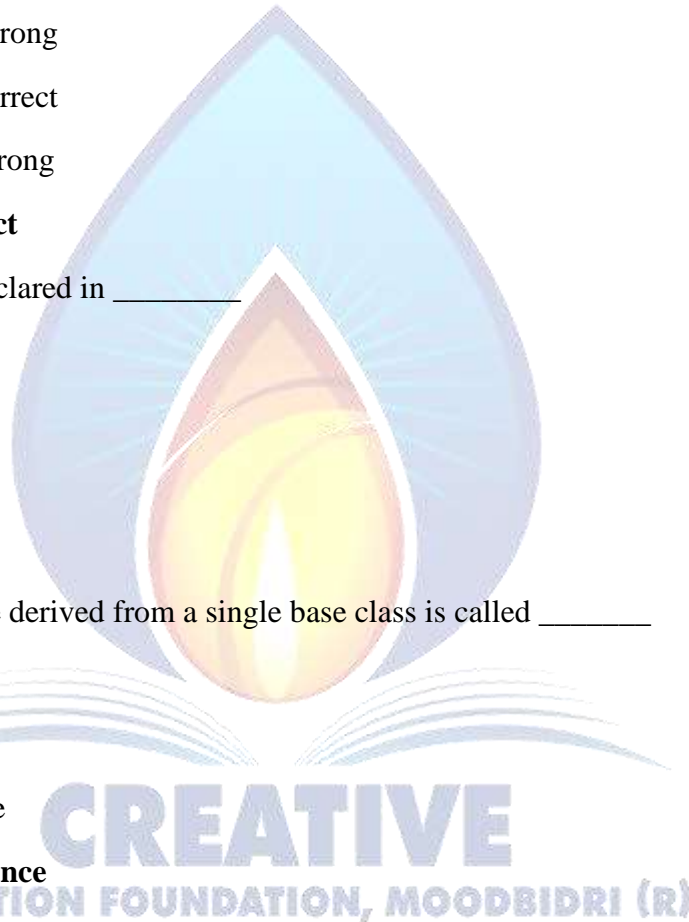
8) If a number of classes are derived from a single base class is called _____

- a) Single inheritance
- b) Multiple inheritance
- c) Multi-level inheritance
- d) **Hierarchical inheritance**

9) In the given program segment identify the error

```
void main()
{
int *ptr, x=18;
ptr=*x;
cout<<"\n output is"<<ptr;
}
```

- a) Unkown identifier
- b) Runtime error



c) **Invalid indirection**

d) Statement missing

10) An example for DBMS software is

a) **ORACLE**

b) C++

c) HTML

d) MS word

11) Name the SQL command used to change the existing data of the table.

a) ALTER

b) **UPDATE**

c) SELECT

d) DELETE

12) MAN stands for

a) **Metropolitan Area Network**

b) Metro station Area Network

c) Modern area network

d) Middle Allocation Network

13) A communication mode that transmits the data in both directions, but only one direction at a time.

a) Simplex

b) Semi duplex

c) **Half duplex**

d) Full duplex

14) Software whose source code is available to customers and it can be modified and redistributed without any limitation is _____

a) **Open Source Software**

b) Community software

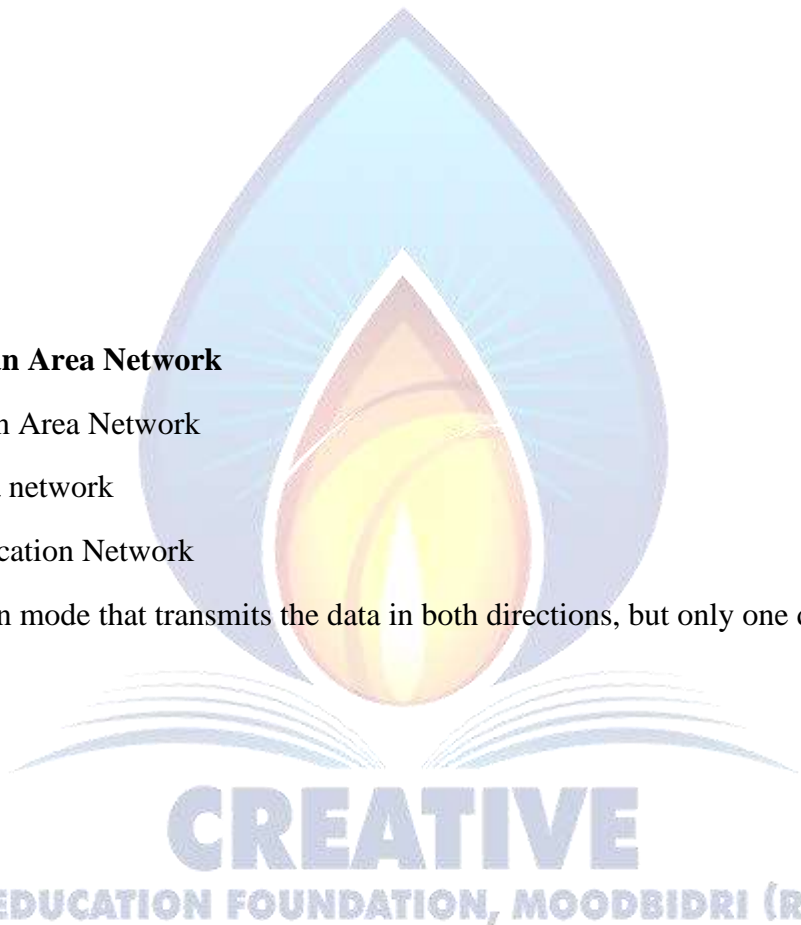
c) Free Software

d) Free ware

15) Which of the following is process of creating and embedding scripts in a web page?

a) Web hosting

b) **Web scripting**



- c) Domain registration
- d) Server side script

II. Fill in the blanks choosing the appropriate word/words from those given in the bracket.

(Domain, Information, Tree, Data mining, Record, Primary key)

- 16) **Information** is processed data with definite meaning.
- 17) A single entry in a table is called as **Record**
- 18) Hierarchical model organizes the data in a **Tree** like structure.
- 19) **Primary key** uniquely identifies each record in a table.
- 20) **Data mining** is concerned with analysis and picking out relevant information.

PART-B

III. Answer any Four questions. Each question carries 2 marks. (4 X 2= 8)

21) State Idempotence law.

This law states that when a variable is combined with itself using OR or AND operator, the output is the same variable.

i.e $X+X=X$

X. $X=X$

22) What is Tautology and Fallacy?

If the result of any logical expression is always TRUE (1) is called Tautology.

If the result of any logical expression is always FALSE (0) is called Fallacy.

23) Define any two characteristics of Object-Oriented Programming.

[Any two]

Object: An object is a collection of data member and associated member functions.

Class: Class is a way of grouping objects having similar characteristics.

Data abstraction :Data abstraction is the process of representing essential features without including background detail.

Data encapsulation: Data encapsulation combines data and functions into a single unit called class.

Inheritance: The process of forming a new class from an existing class is known as inheritance.

Polymorphism The ability of an operator and function to take multiple form is known as polymorphism.

24) What is constructor? Mention its types.

A constructor is a special member function that is used in classes to initialize the objects of a class automatically.

Types of constructors:

Default constructor, Parameterized constructor and Copy constructor.

25) Mention any two functions that belong of ofstream class

[Any two]

put(), write(), seekp(), tellp()

26) Define candidate key and alternate (secondary) key.

Primary Key: A key which is eligible to become the primary key is called candidate key.

Alternate Key: The Alternate keys of any table are simply those candidate keys which are not currently selected as the primary key.

27) Write the syntax and example for DROP command in SQL.

Syntax: DROP table table name;

Example: DROP table student;

28) Briefly explain with neat diagram the star topology.

- This topology consists of a central node to which all other nodes are directly connected by a single path.
- Here each node is connected directly to the central hub.
- All communications between the nodes have to pass through the central hub.



PART-C

IV. Answer any four questions. Each question carries 3 marks.

(4 X 3= 12)

29) Give any three features of USB port.

- Universal Serial Bus port is used to connect a variety of external devices like printers, scanners, pendrive, speakers etc. to a computer. It supports up to 127 devices.
- USB supports a data speed of 12 megabits per second.
- USB is a plug-and-play interface i.e. a new device can be added to the computer without turning it off.

30) Write the logic symbol and truth table of OR gate.

X	Y	X+Y
0	0	0
0	1	1
1	0	1
1	1	1



31) What are the application of stack data structure?

[Any Three]

- It is used to reverse a word.
- “Undo” mechanism in text editor.
- Backtracking: This is a process when you need to access the most recent data element in a series of elements. Once you reach a dead end, you must backtrack.
- Conversion of decimal number to binary.
- Conversion of infix expression into prefix and postfix.
- Quick sort.
- Runtime memory management.

32) Define array of pointers. Give an example.

Array of pointer is an array which stores collection of addresses.

Example:

```
int *p[3];
int a=6,b=8,c=4;
p[0]=&a; /*p[0]=6
p[1]=&b; /*p[1]=8
p[2]=&c; /*p[2]=4
```

33) Explain any three file opening modes.

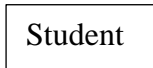
[Any Three]

File mode parameter	Meaning	Stream type
ios::app	Append to end of file	Ofstream
ios::in	Open file for reading only	Ifstream
ios::out	Open file for writing only	Ofstream
ios::binary	Opening a binary file	ifstream,ofstream

34) Briefly explain any three components of ER diagram.

a. Entity:

- An Entity can be any object,place,person or class.
- In E-R Diagram, an entity is represented using rectangles.



b. Attribute:

- An Attribute describes a property or characteristic of an entity.
- Attributes are represented by means of eclipses.
- For example, Roll_No,Name and Birth date can be attributes of a student.



c. Relationship:

- A relationship type is a meaningful association between entity types.
- Relationship is represented using diamond shaped box.



35) What is E-Commerce? Mention any two technologies and services used in E-Commerce.

It is the trade of goods and services with the help of telecommunication and computers.

Technologies / services E- commerce:

[Any two]

- Electronic mail (e-mail).
- E-banking / Net banking.
- Electronic fund transfer (EFT).
- Electronic data interchange.
- Digital cash, smart cards, security services etc.

36) Explain the structure of HTML

```

<HTML>
  <HEAD>
    <TITLE>-----</TITLE>
  </HEAD>
  <BODY> -----
    -----
  </BODY>
</HTML>
  
```

<HTML> tag marks the beginning of the HTML and </HTML> tag marks the end of HTML document. <HEAD> tag begins the head section of the HTML document and </HEAD> tag defines the end of the heading. The <TITLE> tag gives title to HTML document that appears on browser title bar. <BODY> tag defines the body of HTML document.

37) Explain any five operations performed on linear data structure.

- 1. Traversing:** The processing of accessing each element exactly once to perform some operation is called traversing.
- 2. Insertion:** The process of adding a new element into the given collection of data elements is called insertion.
- 3. Deletion:** The process of removing an existing data element from the given collection of data elements is called deletion.
- 4. Searching:** The process of finding the location of a data element in the given collection of data elements is called as searching.
- 5. Sorting:** The process of arrangement of data elements in ascending or descending order is called sorting.

38) Write an algorithm to delete a data element from the queue.

```
Step 1: IF FRONT =NULL then
        PRINT "QUEUE IS EMPTY"
        EXIT
        [End of if ]
Step 2: ITEM = QUEUE[FRONT]
Step 3: IF FRONT = REAR THEN
        FRONT = NULL
        REAR = NULL
        ELSE
        FRONT = FRONT + 1
        [End of if ]
Step 4: RETURN
```

39) Explain any five applications of OOP's.

[Any Five]

- CAD/ CAM Software.
- Computer graphic applications.
- Object -Oriented Database.
- Real-time systems.
- Artificial intelligence and expert systems.
- User Interface design such as windows.

40) What is friend function? Mention its various characteristics.

A non-member function of a class that has access to both private and protected members of a class.

characteristics of friend function

[Any Four]

- A friend function is a non-member function which can access both private and protected members of a class.
- It can be declared anywhere in the class definition, because it is not affected by access specifiers.

- The function is declared with keyword friend.
- While defining friend function it does not use either keyword friend or :: operator.
- A friend function can be invoked like normal function without help of any objects.
- It cannot access the member variables directly and has to use an object name and dot operator(.) with each member name.

41) Define default constructor. Write the features, syntax and example of default constructor.

A constructor which does not take any argument is called a default constructor.

[Any Two]

Features:

- For every object created, the default constructor is automatically called.
- All objects of a class are initialized to same set of values by the default constructor.
- If different objects are to be initialized with different values, it cannot be done using default constructor.

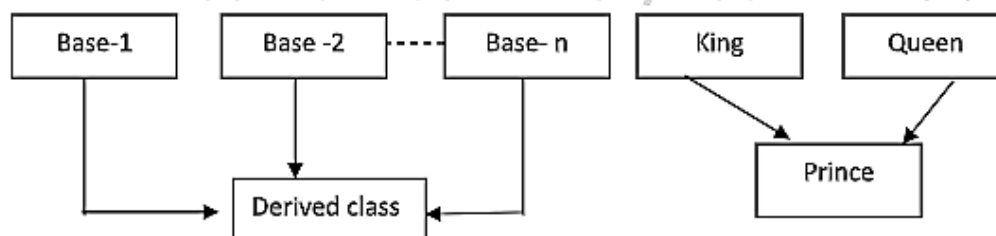
Syntax	Example
<pre>class classname { public: classname() { body of the constructor } };</pre>	<pre>class sum { int a,b; public : sum() { a=0; b=0; } };</pre>

42) What is inheritance? Explain with neat diagram.

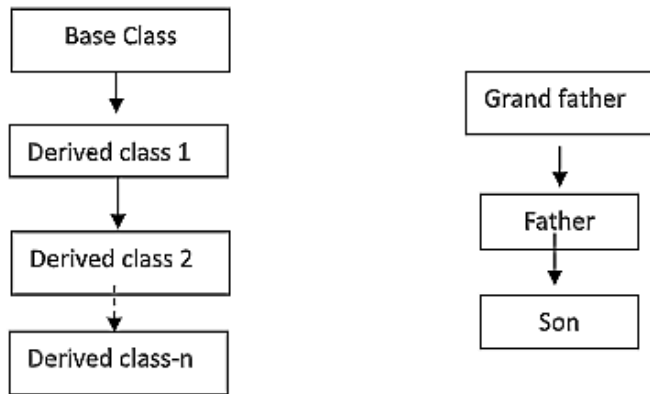
- multiple inheritance
- multilevel inheritance

Inheritance is the capability of one class to inherit properties from another class.

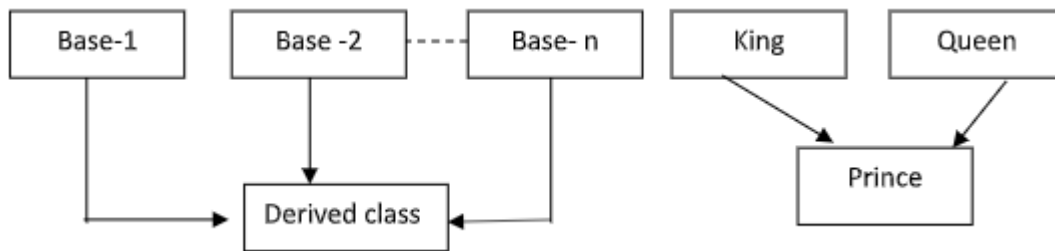
a. **Multiple inheritance:** If a class is derived from more than one base class then it is called as multiple inheritance.



b. **Multilevel inheritance:** The classes can also be derived from the classes that are already derived. This type of inheritance is called multilevel inheritance.



b. **Multiple inheritance:** If a class is derived from more than one base class then it is called as multiple inheritance.



43) Differentiate between manual and electronic data processing.
[Any Five]

Manual Data Processing	Computerized/Electronic Data Processing
Entire process takes place manually.	Entire process takes place by the machine.
The volume of the data, which can be processed, is limited.	The volume of data which can be processed is large.
It requires large quantity of papers.	Less amount of papers are used.
The speed and accuracy is less.	High speed and greater accuracy.
Labor cost is high.	Labor cost is economical.
Storage medium is paper.	Storage medium is Secondary storage medium.
Data transfer is difficult.	Data can be transferred (soft copy) easily through computer networks.

44) What is computer virus? Write the symptoms (characteristics) of computer virus.

Computer Virus is a malicious program that can spread from computer to computer and they can replicate themselves

symptoms (characteristics) of a computer virus.

[Any Four]

- Computer may respond slowly.
- Disk drivers may become inaccessible.
- It creates multiple/duplicate files.
- Unusual error message.
- Computer reboots on its own.
- Applications may not work normally.

PART – E

V. Answer any two questions. Each question carries 5 marks. (2x5=10)

45. Given the Boolean Function $F(A,B,C, D) = \Sigma (0, 1, 2, 3, 4, 7, 8, 12, 15)$ reduce it by using Karnaugh map (K-map).

	CD	$\bar{C}\bar{D}$	$\bar{C}D$	CD	$C\bar{D}$	
$\bar{A}\bar{B}$	1	1	1	1	1	Quad 1
$\bar{A}B$	1	0	1	1	0	
AB	1	0	0	1	0	Pair 1
$A\bar{B}$	1	0	0	0	0	Quad 2

Reduced expression for Quad 1: $\bar{A}\bar{B}$

Reduced expression for Quad 2: $\bar{C}\bar{D}$

Reduced expression for Pair 1: BCD

Final reduced SOP expression $\bar{A}\bar{B} + \bar{C}\bar{D} + BCD$

46) Explain member function defined outside the class definition with a suitable example.

- Member functions declared within a class must be defined separately outside the class.
- The definition of a member function is similar to the normal function, but it has an identity label in the header which tells the compiler which class the member function belongs to.
- The scope resolution operator (::) is used to define a function outside the class definition.

Syntax:

return_type_specifier classname :: function_name (arguments)

```
{
function body
}
```

Programming Example:

```
#include<iostream.h>
#include<conio.h>
class sum
{
private:
int a,b;
public:
void input();
void output();
};
```

```

void sum::input( )
{
cout<<"Enter two number";
cin>>a>>b;
}
void sum::output( )
{
cout<<" The sum is"<<a+b;
}
void main( )
{
sum s;
s.input( );
s.output( );
getch( );
}

```

47) With reference to the table given below, write the SQL commands to perform following operations.

Table Name: employee

EMPID	NAME	DOB	Salary	Tax	Net Salary
1001	ABC	28-01-72	50,000	10,000	40,000
1002	EFG	29-05-70	60,000	15,000	45,000
1003	XYZ	18-04-73	45,000	9,000	36,000
1004	PQR	14-03-74	44,000	7,000	37,000

- a) **Display all the records from “employee” table.**
Select * from employee;
- b) **Find the maximum of Net salary.**
Select Max(Net_Salary) from employee;
- c) **Find the minimum of Net salary.**
Select Min(Net_Salary) from employee;
- d) **Delete all the records from the table “employee”.**
Delete from employee;
- e) **Remove the table “employee”.**
Drop table employee;

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