SUBJECT : COMPUTER SCIENCE (41)

TIME : 3 Hours 15 Mins   **Max Marks : 70**

PART – A

I. Answer any ten questions. Each question carries One mark   **1 X 10 = 10**

1. Expand CMOS.

Complementary Metal Oxide Semiconductor.

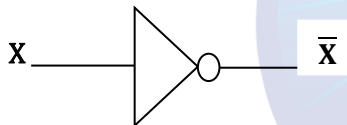**2. State Involution law.**

This law states that the complement of a variable is complemented again we get the same variable.

i.e $\overline{\overline{X}} = X$

3. Give the dual form of 1+0=1.

0.1=0

4. Write the standard symbol for NOT gate.

5. Give an example for non-linear data structure.

Tree, Graphs

6. Define the term 'Data abstraction'.

Data Abstraction is the the process of representing essential features without including background details.

7. Which operator is used to access the member function outside the class?

. (dot operator)

8. Which access specifier is implicitly used in a class?

Private

9. What is a constructor?

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

10. Give is the use of 'new' operator in pointers.

The new operator is used to allocate memory for objects during execution time (run time).

11. Define information.

Information is processed data, stored or transmitted by a computer.

12. What is data mining?

The discovery of knowledge from the collected data is called data mining.

or

Data mining is concerned with the analysis and picking out relevant information from collected data.

13. Define Network Topology.

The actual appearance or layout of networking is termed as Network Topology.

14. What is Telnet?

It is an internet utility that lets you log on to remote computer system**.**

15. What is XML?

Ans: XML is eXtended Markup Language for web documents which enclose the multimedia contents.

PART – B

II Answer any Five questions. Each question carries Two marks   5 X 2 = 10
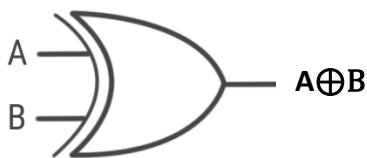
16. Mention the two types of UPS.

   a) Standby UPS (off-line UPS)

   b) Online UPS.

17. Prove algebraically X(X+Y)=X.

   LHS $= X(X+Y)$

             $= X.X + XY$

             $= X+XY$ $(:.X.X=1)$

             $= X(l+Y)$

             $= X.1$ $(:.l+X=1)$

             $= X$ $(:.X.1=X)$

             $= RHS$

18. Write standard symbol and truth table for XOR gate.

A	B	A⊕B
0	0	0
0	1	1
1	0	1
1	1	0

19. Give any two advantages of inline function.

 (Any two)

      1. The inline member functions are compact function calls.

      2. The size of the object code is considerably reduced.

      3. The speed of execution of a program increases.

      4. Very efficient code can be generated.

      5. The readability of the program increases.

20. Write two disadvantages of default constructor.

- When many objects of the same class are created, all objects are initialized to same set of values by default constructor.

- It is not possible to initialize different objects with different initial values using default constructor.

21. What is pointer? Give the syntax of pointer declaration

Pointer is a variable which stores the address of another variable.

     Syntax: data_type *pointer_variable;

22. What is data file? Explain any one type of data file.

A file which stores data and information permanently in secondary memory for future use is called data file.

There are 2 types of files (explain any one)

<u>Text File</u>

It is a file that stores information in ASCII characters. EOF and EOL characters are allowed.

In this file translation is required to binary format.

<u>Binary File</u>

It is a binary file is a file that contains information in the same format as it is held

in memory.EOF and EOL characters are not allowed. No translation is required.

23. Define primary Key and foreign key.

  Primary key: Primary key is a key that uniquely identify each record in a table.

  Foreign key: When we combine two databases, then primary key of one database can be used in another database, such keys are called as foreign key.

24. Mention any two web browsers.

Google chrome, Mozilla Firefox, Internet Explorer.

25. What is web scripting? Mention any one type of web scripting.

The process of creating and embedding scripts in a web page is known as Web scripting.

Types are: (any one)

 i) Client side scripts

 ii) Server side scripts

PART – C

**III. Answer any Five questions. Each question carries three marks   5 X 3 = 15**

**26. Explain the characteristics of motherboard.**

 a) Form factor: The shape and layout of a motherboard is called Form factor**.** It refers to the motherboard's geometry, dimensions, arrangement and electrical requirements.

 b) Chipset: It coordinates data transfer between the various components of the computer. It controls the majority of resources of the system.

 c) Processor socket: It is a rectangular connector into which the processor is mounted vertically or a square shaped connector with many small connectors into which the processor is directly inserted.

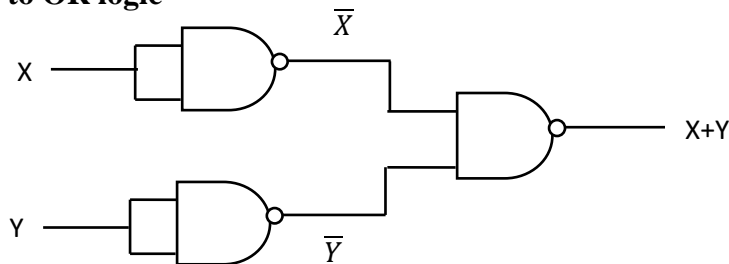**27. Realize AND, OR, NOT gate using NAND gate.**

a. NAND to NOT logic
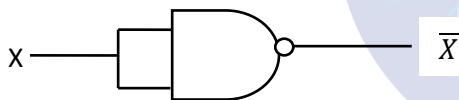
b. NAND to AND logic
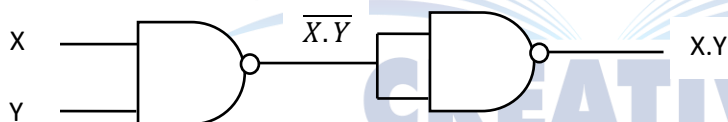

c. NAND to OR logic

28. Explain the types of linked list.

 1. Single linked list   2. Doubly linked list   3. Circular linked list

Single linked list

A singly linked list contains two field in each node - the data field and link field. The data field contains the data of that node while the link field contains address of the next node is called as singly linked list.

Start

| 10 | O | → | 20 | O | → | 30 | O | → | 40 | Null |
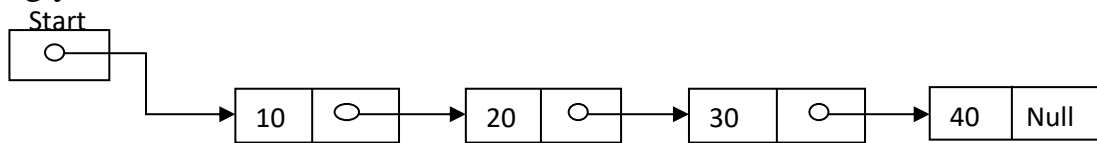
Circular linked lists:

The link field of the last node contains the address of the first node is called as circular linked list. In circular linked list is possible to reach any node from any other

Start

| 10 | O | → | 20 | O | → | 30 | O | → | 40 | O |
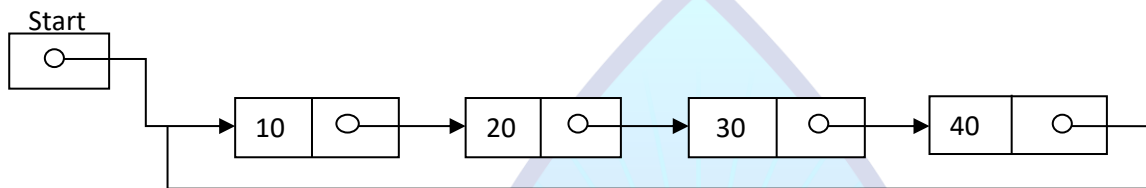
Doubly linked lists:

Doubly linked list is a linked list in which each node is points both to the next node and also to the previous node.

← | O | INFO | O | →
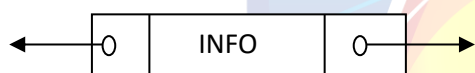
In doubly linked list each node contains three parts:

- FORW : It is a pointer field that contains the address of the next node
- BACK: It is a pointer field that contains the address of the previous node.
- INFO: It contains the actual data.

In the first node, if BACK contains NULL, it indicated that it is the first node in the list.

The node in which FORW contains, NULL indicates that the node is the last node.

29. What is inheritance? Define base class and derived class

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

Base class :The class whose properties are inherited by another class.

Derived class: The class that inherits properties from base class.

30. Differentiate dynamic memory allocation and static memory allocation.

(Any three)

Static allocation of memory	Dynamic allocation of memory
1.Memory is allocated During compilation	1.Memory is allocated during the execution of the program
2.Variables remain permanently allocated	2.Allocated only when program unit is active
3. Implemented using data segments.	3. Implemented using heaps and stacks.
4. No memory allocation or de-allocation actions are performed during execution	4.Memory allocation and de-allocation are performed during the execution
5. Amount of memory to be allocated is pre-known	**5.** Amount of memory to be allocated is need not to be pre-known.

31. What is the use of following function?

a) get( )   b)getline( )   c)read( )

get( ): It reads a single character from the text file.

getline( ): It is used to read a whole line of text.

read( ): It reads binary data from a file.

32. Discuss ORDER BY clause of SQL with syntax and example.

ORDER BY clause is used to display the result of a query in a sorted order. The sorting

can be done in ascending or in descending order.

Syntax: SELECT columnlist FROM table_name WHERE condition ORDER BY

columnlist [ASC / DESC];

Example: Select * from student ORDER BY regno;

33. Write computer virus prevention methods.

 (Any three)

- Install the anti- virus software and keep updating it.

- Scan and confirm for no viruses before using an external disk like pen drive.

- Download the contents from the internet only thorough scanning.

- Better use the licensed software.

- Never to boot a PC from a floppy unless it is virus free.

- Apply the access control and security to the computer system.

34. Explain types of e-commerce.

(Any three)

   i) Business-to-Business (B2B): The exchange of services, information or products from one business to another business partners.

   Example : Intel selling microprocessor to Dell.

   ii)Business-to-Consumer (B2C): The exchange of services, information or product from business to a consumer.

   Example: Flipkart, Amazon, Snapdeal.

   iii)Consumer to Business (C2B): Customer directly contact with business vendors by posting their project work with set budget online.

Example: Guru.com, freelanser.com

   iv)Consumer to Consumer (C2C): Here person to person transaction take place. Where individuals can buy and sell products.

   Example : OLX.

35. Explain any three HTML tags.

   i. **:** This tag display output as bold.

         Example: Text

   ii. <u>**:** This tag display output as underlined.

         Example: <u>Text</u>

   iii. **<i>:** This tag display output as italic.

         Example: <i>Text</i>

PART – D

IV. Answer any seven questions. Each question carries five marks   **7 X 5 = 35**

36. Simplify F(A,B,C,D)=∑(0,1,4,5,7,8,9,12,13,15) using K-Map.

Reduced expression for Octa 1: $\overline{C}$

Reduced expression for Quad 1: BD

Final reduced SOP expression: $\overline{C} + BD$

37. Write an algorithm for insertion sort method.

Step 1: For I=1 to N-1

Step 2: J = I

    While(J >= 1)

     if (A[J] < A[J-1]) then

     Temp = A[J]

     A[J] = A[J-1]

     A[J-1] = Temp

    [End if]

    J = J-1

    [End of While loop]

    [End of For loop]

Step 3: Exit

38. Explain any five stack operation.

(Any five)

Stack(): creates a new empty stack.

Push(item): adds a new item to the top of the stack.

Pop(): removes the top item from the stack.

Peek(): returns the top item of the stack.

isEmpty(): tests whether the stack is empty or not.

Size(): returns the number of items in the stack.

39. Write an algorithm for deleting an element from a QUEUE data structure.

Step 1: IF FRONT = -1 THEN

    PRINT "QUEUE IS EMPTY"

    [end of if]

    EXIT

Step 2: ITEM = QUEUE[FRONT]

Step3: IF FRONT = REAR THEN

    FRONT = 0

    REAR = 0

ELSE

FRONT = FRONT + 1

[end of if]

Step 4: Return

40. Give the advantages of Object Oriented Programming.

(Any five)

1. The programs are modularized based on the principle of classes and objects.

2. It reduces code duplication.

3. Providing data security with data encapsulation.

4. With the help of inheritance, we can reuse the existing code.

5. Data abstraction separates object specification and object implementation.

6. With the help of polymorphism, we can easily develop complex software.

7. Reduces software development time.

8. Communication with outside system is very simple with message passing.

41. Explain member function defined inside the class with programming example.

When the function is defined within a class the function declaration is replaced by function definition.

Only small functions are defined inside class definition.

Syntax:

```
return_type_specifier  function_name(arguments)
{
    function body;
}
```

Programming Example:

```
#include<iostream.h>
#include<conio.h>
class sum
{
  private:
        int a,b;
  public:
        void input( )
        {
        cout<<"Enter two number";
        cin>>a>>b;
        }
```

```
            void output( )
            {
            cout<<"sum is="<< a+b;
            }
    };
    void main( )
    {
            sum s;
            s.input( );
            s.output( );
            getch( );
    }
```

42. What is a friend function? Explain the characteristics of friend function.

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

Characteristics: (Any four)

1. It can be declared either in public or private part of a class.
2. The function is declared with keyword friend.
3. While defining friend function it does not use either keyword friend or :: operator.
4. A friend function cannot be called using the object of that class. It can be invoked like any normal function
5. It cannot access the member variables directly and has to use an object name and dot membership operator with each member name.

43. Define destructors. Write syntax and example for destructor.

Destructor is a special member function that destroys an object that has been created by constructors.

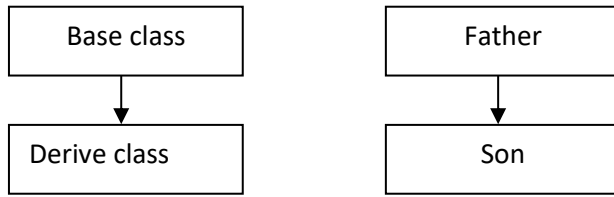| Syntax :	Example :
```class classname { public: classname( ) { body of the constructor } ~classname( ) { body of the destructor } };```	```class sum { int a,b; public : sum( ) { a=0; b=0; } ~sum( ) { } };```

44. Describe the different types of inheritance.

1. **Single Inheritance:** If a class is derived from a single base class, it is called as single inheritance.

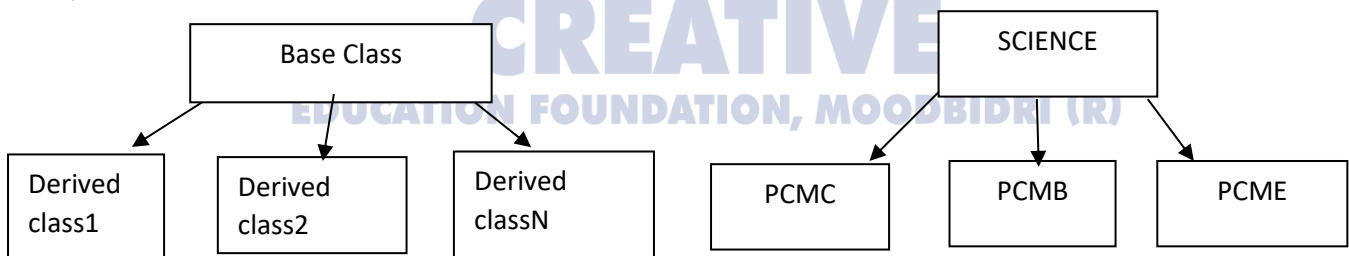| Base class	Father
↓	↓
Derive class	Son

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

Base Class
↓
Derived class 1
↓
Derived class 2
↓
Derived class-n

Grand father
↓
Father
↓
Son
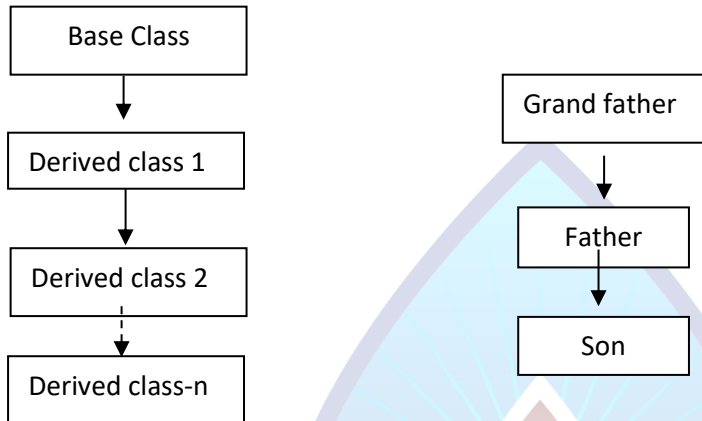
3. **Multiple inheritance:** If a class is derived from more than one base class then it is called as multiple inheritance.

Base-1   Base -2 ----- Base- n   King   Queen
↓ → Derived class ←   ↓ → Prince ←
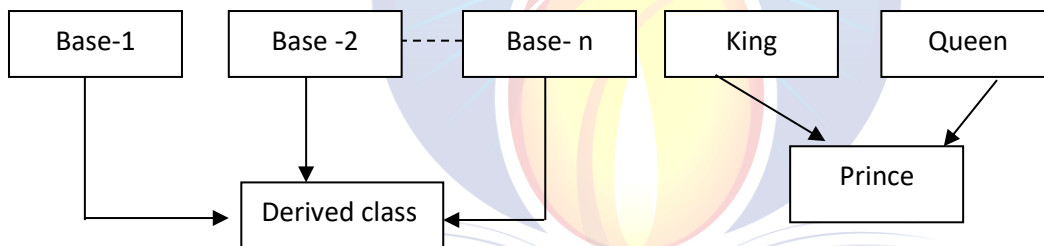
4. **Hierarchical inheritance:** If a number of classes are derived from a single base class, it is called as hierarchical inheritance.

Base Class
↙ ↓ ↘
Derived class1   Derived class2   Derived classN

SCIENCE
↙ ↓ ↘
PCMC   PCMB   PCME

5. Hybrid inheritance: It is a combination of hierarchical and multilevel inheritance

Base class
↙ ↘
Derived class1   Derived class 2
↘ ↙
Derived class 3

Cricketer
↙ ↘
Batter   Bowler
↘ ↙
All-Rounder
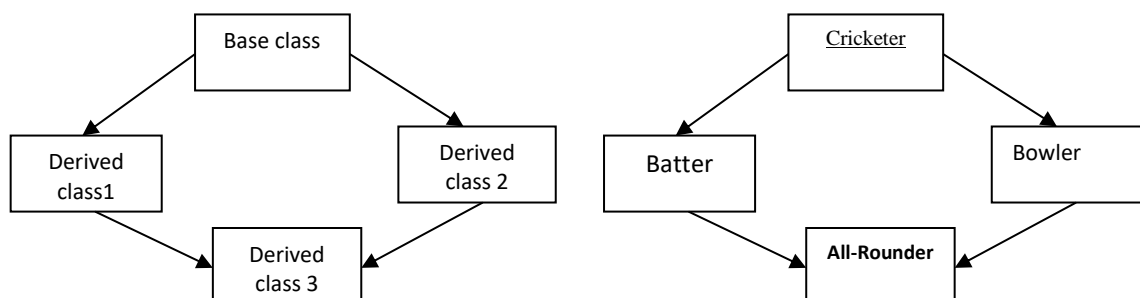
45. Briefly explain the steps involved in data processing cycle.

   i) Data Input: The raw data is put into the computer using a keyboard, mouse or other devices such as the scanner, microphone and the digital camera.

   ii) Data Processing It is a series of actions or operations to the input data to generate outputs. Operations can be some condition, calculation, sorting etc.

   iii) Data storage: Data should be stored in memory so that it can be accessed later

.   There are two types of storage:

           i) Primary storage: It holds data temporarily in devices like RAM.

           ii)Secondary storage: It holds data permanently in devices like pendrive, hard disk.

   iv)Output: Result obtained after processing the data must be presented to the user in user understandable form using devices like monitor, printer, speakers etc

   v)Communication: In communication data is input through wires or wireless connections

      Example: E-mail, LAN etc

46. Discuss the features of database System.

   (Any five)

   1. Centralized data management: Data are stored at central location and shared among   multiple users.

   2. Controlled data redundancy: This eliminates replicating (duplication) and saves the storage space.

   3. Data sharing: The data stored in the database can be shared among multiple users or application programs.

   4. Data security: Since the data is stored centrally, providing security is much easier.

   5. Multiple user interfaces: DBMS provides different types of interfaces to fulfill the requirements of different users having different technical knowledge.

   6. **Backup and recovery:** It provides backup and recovery subsystem that is responsible for recovery from hardware and software failures.

47. Explain five logical operators available in SQL.

OPERATOR	DESCRIPTION
NOT	The NOT operator reverses the meaning of the logical operator with which it is used.
OR	The OR operator is used to combine multiple conditions in an SQL statement's where clause.
AND	The AND operator allows the existence of multiple conditions in an SQL statement's where clause.

BETWEEN	The BETWEEN operator is used to search for values that are within a set of values, given the minimum value and the maximum value.
IS NULL	The NULL operator is used to compare a value with a NULL value.
UNIQUE	The UNIQUE operator searches every row of a specified table for uniqueness.

48. Mention any two DDL command. Explain with syntax and example.

 DDL commands are **CREATE, ALTER and DROP.**

 (Any two)

a) **CREATE command:** Create command is used to create a table in SQL.

   Syntax: Create table table_name(Column1 datatype,column2 datatype . . . column_n datatype);

   Example: Create table student (regno number(5), name varchar(10),total number(3));

b) **ALTER command:** The table can be modified or changed by using the alter command.

   Syntax: Alter table table_name ADD (columnname1 datatype, columnname2 datatype,.....);

   Example: Alter table student ADD (percent number(3), result varchar(4));

c) **DROP command:** An existing table can be removed from the database using drop command.

   Syntax: Drop table table_name;

   Example: Drop table student;

49. What is computer network? Explain goals of network.

   A computer network is an interconnection of two or more computers that are able to exchange information.

 The main goals of network are:

 (a) **Resource Sharing:** All the programs, data and peripheral devices should be available to all the users on the network irrespective of the physical location of the resources and the user.

 (b) **Reliability**: A file can have copies on two or three different machines, so if one of them is unavailable(hardware crash), the other copies could be used.

 (c) **Cost Factor**: Personal computers have better price/performance ratio than micro computers. So it is better to have PC's, one per user, with data stored on one shared file servermachine.

 (d) **Communication Medium**: Using network we can easily communicate with person in different places regardless of distance and this speeds up the process efficiently.

****

DEPARTMENT OF COMPUTER SCIENCE

- ➢ Mr. Jnanesh Kotian
- ➢ Mr. Mahesh Kumar C
- ➢ Mr. Pratheek Kumar
- ➢ Miss. Preethika K V
- ➢ Mr. Sujan J

CREATIVE EDUCATION FOUNDATION (R)

www.creativeedu.in   Phone No: 9019844492