

05 Computer Science-2019

Section - A

1. Choose the correct answer from the following
- (a) A set of conditional/ternary operator(s) is/are
 (i) +, -, *, /, % (ii) >, <, >=, <=, ==, !=
 (iii) &&, ||, ! (iv) ?: **Ans.(iv)**
- (b) Which operator has the lowest precedence?
 (i) sizeof (ii) Unary
 (iii) Assignment (iv) Comma **Ans.(iv)**
- (c) In C++ programming strlen() function is used for
 (i) Count length of a string
 (ii) Copy two strings
 (iii) Compare two strings
 (iv) Concatenate two strings **Ans.(i)**
- (d) In C++ programming array index is always starts from.
 (i) 0 (ii) 1
 (iii) 2 (iv) 3 **Ans.(i)**
- (e) Which loop checks the condition on
 (i) top (ii) bottom
 (iii) middle (iv) none of these **Ans.(i)**
- (f) Which of the following is the symbol for AND operator?
 (i) || (ii) &&
 (iii) & (iv) none of these **Ans.(ii)**
- (g) What will be the output of the following condition statement $A = 15 >= 15 ? 15 : 16$
 (i) 16 (ii) 15
 (iii) 31 (iv) none of these **Ans.(ii)**
- (h) If an array is declared as `int arr [5] [5]`, how many elements can it store?
 (i) 0 (ii) 5
 (iii) 10 (iv) 25 **Ans.(iv)**
- (i) In C++ programming '\v' is used for
 (i) Form feed (ii) Line brake
 (iii) Vertical tab (iv) Alarm **Ans.(iii)**
- (j) Which of the following data structures is non-linear type?
 (i) Strings (ii) Lists
 (iii) Stacks (iv) none of these **Ans.(iii)**
- (k) The operation of processing each element in the list is known as
 (i) Sorting (ii) Merging
 (iii) Inserting (iv) Traversal **Ans.(iv)**
- (l) A boolean function of n variables has.....rows of possible input combinations.
 (i) n (ii) 2n
 (iii) 2ⁿ (iv) 2n - 1 **Ans.(iii)**

- (m) Which of the following is not a type of constructor?

- (i) Copy constructor
 (ii) Parameterised constructor
 (iii) Default constructor (iv) Friend constructor

Ans (iv)

- (n) The Boolean expression $A \cdot (B + C) = AB + AC$ is called

- (i) Associative Law (ii) Commutative Law
 (iii) Absorption Law (iv) Distributive Law

Ans. (i)

- (o) In which topology has every node an equal chance to transmit data?

- (i) Ring (ii) Star

- (iii) Bus (iv) Mesh **Ans.(i)**

- (p) How many layers are there in the TCP/IP model?

- (i) 1 layer (ii) 3 layers

- (iii) 5 layers (iv) 7 layers **Ans.(iii)**

Section - B

Very Short Answer Questions:

2x9=18

2. What is the difference between Character and String in C++?

Ans. Character :-

1. Character is collection of variables, of character data type.

2. A character does not define a data type.

String

1. String is class and variables of string are the object of class "string".

2. A string defines a data type in C++.

3. Differentiate between Variable and Identifier.

Ans. Identifier

1. Identifier is used to name variable, function, class, structure, union etc.

2. All identifier are not variable.

Variable

1. Variable is used to name a memory location. Which holds a value.

2. All variables names are identifier.

4. Evaluate the following C++ expressions where a, b, c are integers and d, f are floating point numbers. The values are a = 5, b = 6 and d = 3.5.

(a) $c = a++ - (b++) * (--d)$

(b) $f = (++b) * b - a++$

Ans. (a) $C = a++ - (b++) * (--d)$

$C = 6 - 7 * 2.5$

$C = -1 * 2.5$

$C = -2.5$

Section - C

(b) $f = (+ + b) * b - a ++$
 $f = (7) * 7 - 6$
 $f = (7) * 1$
 $f = 7$

5. What data types would you use to represent the following items?

- (a) The number of employees in a Department
- (b) The Salary of an employee
- (c) The identification number of an employee
- (d) The registration number of a vehicle.

Ans. (a) Long, Int (b) Float
 (c) Char (d) Char

6. Write an algorithm to insert an element in queue.

Ans. Procedure QINSERT (Q, F, R, N, Y):

1. [Over flow?]
 If R = N
 then write ('OVERFLOW')
 Return
 2. R = R + 1
 3. Q[R] = Y
 4. {f f = 0
 then f = 1
 Return.

7. Write an algorithm to count total number of nodes in a linked list.

Ans. Algorithm :

- (i) Ptr = Start, Count = 0
- (ii) While Ptr <> NULL do steps iii and v
- (iii) if Ptr c > info = ITEM then
- (iv) Count = count + 1
- (v) Ptr = ptr -> link
- (vi) Print "No. of occurrence (s) is/are", count.

8. What is the role of a Database Administrator in a database system?

Ans. Database administrator. Database administrator (DBAs) use specialized software to store and organize data. The role may include capacity planning, installation, Configuration, database design, migration, performance monitoring, security, troubleshooting, as well as backup and data recovery.

9. Prepare a truth table for $ABC + BC$.

A	B	C	ABC	BC	ABC + BC
0	0	0	0	0	0
0	0	1	0	0	0
0	1	0	0	0	0
0	1	1	0	1	1
1	0	0	0	0	0
1	0	1	0	0	0
1	1	0	1	0	1
1	1	1	1	1	1

Ans.

10. What is Topology?

Ans. Network topology is the arrangement of the elements of a communication network. Network topology can be used to define or describe the arrangement of various types of telecommunication network, including command and control radio networks, industrial fieldbusses, and computer network.

Long Answer Questions :

11. What is the concept of a Data hiding and how is it achieved using class and objects?

Ans. Data hiding is a related concept to data abstraction. Unessential features or background details are hidden from the world.

A class groups its members into three section. private, protected and public. The private and protected members remain hidden from outside the world. Thus through private and protected members, a class enforces data-hiding.

12. Give the output of the following program"

```
#include<iostream.h>
#include<conio.h>
void main ()
{
    int s=0;
    clrscr ();
    for (int i=2; i<15; i++)
    {
        s=s+i;
        cout<<"\n"<<i<<"\t"<<s;
    }
}
```

Ans. 2 2
 3 5
 4 9
 5 14
 6 20
 7 27
 8 35
 9 44
 10 54
 11 65
 12 77
 13 90
 14 104

13. Write a program in C++ to find the product of any five numbers using constructor member functions.

```
Ans. #Include <iostream. h>
#include <conio. h>
class abc
{
    public:
    int a,b, c,d,e;
}
{
    abc ()
{
    a = 1 ;
    b = 2 ;
    c = 3 ;
    d = 4 ;
    e = 5 ;
int m ;
m = a * b * c * d * e ;
Cout <<"Result. " <<m ;
}
}
Void main ()
{
    abc ob ;
    getch () ;
}
```

14. What is an operator overloading and operator overriding? Explain it with a suitable example.

Ans. Operator Overloading :- In operator overloading we can use same function name with different parameters for multiple times for different tasks with on a class.

```
Ex-
class Distance
{
    public ; feel inch
    Distance (int f, int i)
    {
        this -> feet = f;
        this -> inch = i;
    }
    void operator ( )
    {
        feet -- i
        inch -- i
        cout << "In feet & Inches " <<
```

```
feet << " " << inch;
    }
};
```

```
int main ( )
{
    Distance d1 (8, 9),
    - a1;
    return 0;
}
```

Operator Overriding:- Operator overriding means we can use same name function name with same parameters of the base class in the derived class. This is also called as reuseability of code in the program.

```
#include <iostream>
class Baseclass
{
    Public ;
    Virtual void Display ( )
    {
        Cout << " In this is Display ( ) method"
        "of Baseclass";
    }
    Void Show ( )
    {
        cout << " In This is show ( ) method"
        "of Baseclass";
    }
};
```

```
Class Derived class : Public Baseclass
{
    Public :
    Void Display ( )
    {
        Cout << " In This is Display ( ) method"
        "of DerivedClass";
    }
};
```

```
int main ( )
{
    Derived class dr ;
    BaseClass & bs = dr;
    bs. Display ( );
    dr. Show ( );
}
```

15. Define the terms 'constructor' and 'destructor' in detail with suitable examples. Write their difference.

Ans. Constructor :- A constructor is a member function having the same name as that of the class and which get invoked every time a new object is created. It is used to construct and initialize object values.

Destructor :- A destructor has the same name as that of constructor function preceded with a sign. If get invoked every time an object goes out of scope. It is used to destroy objects.

Ex- Class largest

```
{
private :
    int i, a [10], l, s,
public :
    largest ( )
{
```

```
    cout << "Enter Ten no." i
    for (i=0; i<=9; i++)
        (in >> a [i];
```

```
    }
    ~loargest ( )
    { cout << "Program is over",
    }
    Void process ( )
{
```

```
    s = a [0];
    l = a [0];
    for (i=1; i<=9; i++)
    {
        if (s > a [i])
            s = a [i];
        if (l > a [i])
            l = a [i];
    }
}
```

```
    }
    Void display ( )
    {
        cout << "Largest No. " << l << endl;
        cout << "smallest no. " << s << endl;
    }
};
```

16. Evaluate the following postfix expressions using a stack and show the contents of stack after execution of each operation: 300, 10, 30, +, 20, *, +.

Ans. 300, 10, 30, +, 20, *, +

(i)

			300
--	--	--	-----

(ii)

		10	300
--	--	----	-----

(iii)

	30	10	300
--	----	----	-----

(iv)

		40	300
--	--	----	-----

(v)

	20	40	300
--	----	----	-----

(vi)

		800	300
--	--	-----	-----

(vii)

			1100
--	--	--	------

Answer - 1100

17. Transform each of the following expressions to prefix and postfix form : 3

- (a) $(A - B * (C + D)) / E * F$
 (b) $(A + B) - C * D$

Ans. (a) $(A - B * (C + D)) / E * F$

Prefix : $(A - B * C + D) / E * F$

$(A - (*BC) + D) / (*EF)$

$((-A * BC) + D) / (*EF)$

$((+ - A * BCD) / (*EF))$

$/ + = A * BCD * EF$

Partfix :

$(A - (BC *) + D) / (EF *)$

$((ABC * -) + D) / (EF *)$

$(ABC * - D +) / (EF *)$

$ABC * - D + EF * /$

(b) $b > (A + B) - C * D$

Pref: $+ AB - C * D$

$- + ABC * D$

$* - + ABCD$

Parfyix : $A + B - CD *$

$AB + - CD *$

$AB + CD * -$

18. Write an algorithm for Insertion Sort sorting procedure.

Ans. Procedure ISORT (A,N)

- Set $A[0] = -\infty$
- Repeat steps 3 to 5 for $K = 2, 3, \dots, IV$
- Set $TEMP = A[k]$ and
Set $PTR = k - 1$
- Repeat while $TEMP < A[PTR]$
 (A) Set $A[PTR + 1] = A[PTR]$
 (B) Set $PTR = PTR - 1$
- Set $A[PTR + 1] = TEMP$
- Return.

19. Write SQL commands for (a) to (d) on the basis of M_C_DEPT relation given below:

Sl. No	P_Name	Age	Department	Date-of-adm	Charges	Sex
1	Ramayan	62	Surgery	23/02/15	8000	M
2	Rajani	22	ENT	20/01/15	3000	F
3	Rajhans	32	Orthopaedic	19/02/15	5500	M
4	Badrinath	12	Surgery	1/1/2015	5600	M
5	Satyakam	36	ENT	12/1/2015	4500	M
6	Archana	16	ENT	24/02/15	3800	F
7	Baby	29	Cardiology	20/02/15	8800	F
8	Biva	45	Gynaecology	22/02/15	9000	F
9	Prakash	19	Cardiology	13/01/15	9900	M
10	Neha	23	Nuclear Med	19/02/15	6000	F

(a) To show all information about the patients of Cardiology department.

(b) To list the names of female patients who are in Gynaecology department.

(c) To list the names of all patients with their dates of admission in ascending order.

(d) To count the number of patients with age < 36.

Ans. (a) Select * from M_C_DEPT where Department = "Cardiology".

(b) Select * name from M_C_DEPT where Department = "Gynaecology";

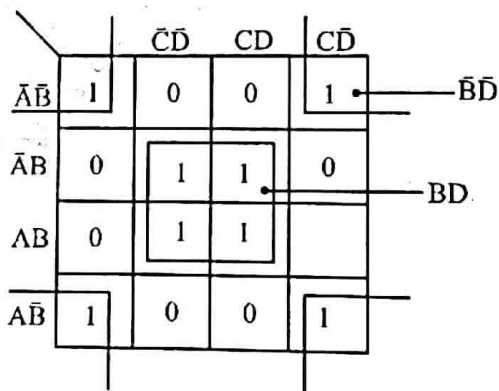
(c) Select P_name, Date-of-adm from M_C_DEPT order by Date-of-adm;

(d) Select count (P_name) as result from M_C_DEPT where Age < 36;

(e) Serves - A serves is a computer dedicated host to serve the needs of users and other computers on a network.

20. Obtain a simplified form for the following Boolean Expression using Karnaugh Map.

$$F(A, B, C, D) = \sum (0, 2, 5, 7, 8, 10, 13, 15)$$



$$F(A, B, C, D) = \bar{B}\bar{D} + BD = 1$$

21. Define the terms

- (i) Node (ii) Network
 (iii) Client (iv) Server.

Ans. (i) Node - It is a physical device within a network of other devices that's able to send, receive and forward information.

(ii) Network - It is an inter connected collection of autonomous computers that can share and exchange information.

(iii) Client - It is a piece of computer that accesses a service made available by a server.