

# Computer Science - 2018

## Section - A

### Multiple Choice Questions :

Q.1. Choose the correct answer from the following :

- (a) `main ()` is a /an  
 (i) keyword (ii) object  
 (iii) function (iv) none of these  
 Ans. (iii) function
- (b) Destructor has the same name as the constructor and it is preceded by  
 (i) ! (ii) @  
 (iii) ~ (iv) \$  
 Ans. (iii) ~
- (c) A set of logical operators is  
 (i) +, -, \*, /, % (ii) >, <, >=, <=, ==, !=  
 (iii) &&, ||, ! (iv) ?:  
 Ans. (iii) &&, ||, !
- (d) Which of the following is not a feature of C++?  
 (i) Operator overloading (ii) Inheritance  
 (iii) Namespace (iv) Reflection.  
 Ans. (iv) Reflection.
- (e) Which of the following is not a type of constructor?  
 (i) Copy constructor  
 (ii) Parameterised constructor  
 (iii) Default constructor (iv) Friend constructor  
 Ans. (iv) Friend constructor.
- (f) Which of the following is not the member of class ?  
 (i) Static function (ii) Friend function  
 (iii) Const function (iv) Virtual function.  
 Ans. (ii) Friend function
- (g) Which of the following concepts provides facility of using object of one class inside another class ?  
 (i) Encapsulation (ii) Composition  
 (iii) Abstraction (iv) Inheritance.  
 Ans. (iii) Abstraction
- (h) which of the following sorting algorithms is of divide-and-conquer type ?  
 (i) Bubble sort (ii) Insertion sort  
 (iii) Quick sort (iv) All of these  
 Ans. (iii) Quick sort.
- (i) The operation of processing each element in the list is known as  
 (i) Sorting (ii) Merging  
 (iii) Inserting (iv) Traversal  
 Ans. (iv) Traversal
- (j) Transformation of infix operation  $(A+B*(C-D))/E * F$  to post-fix is  
 (i)  $ABC*+D-EF*$  (ii)  $ABC*+ D-EF*$   
 (iii)  $ABC*+D-EF$ \* (iv) none of these  
 Ans. (i)  $ABC*+D-EF*$
- (k) The following are components of a database except

- (i) user date (ii) metadata  
 (iii) reports (iv) Indexes.

- Ans. (iii) reports
- (l) A row in a relation is called  
 (i) Data (ii) Tuple  
 (iii) Domin (iv) none of these  
 Ans. (ii) Tuple
- (m) The Boolean Expression  $A.(B.C) = A.B).C$  is called  
 (i) Associative Law (ii) Commutative Law  
 (iii) Absorption Law (iv) Distributive Law  
 Ans. (i) Associative Law
- (n) Tautology means a Boolean Expression that always results in  
 (i) true (ii) false  
 (iii) both (a) and (b) (iv) none of these  
 Ans. (i) true
- (o) .....is a network of networks.  
 (i) Internet (ii) Intranet  
 (iii) Webpage (iv) Browser  
 Ans. (i) Internet
- (p) Which of the following layers is not in OSI model.  
 (i) Physical layer (ii) Internet layer  
 (iii) Network layer (iv) Transport layer  
 Ans. (ii) Internet layer

## Section - B

### Very Short Answer Questions :

Q.2. Write two major differences between object Oriented Programming and Procedural Programming.

Procedural Programming	ObjectOriented Programming
(1) In this Programming Language, Program is divided into small parts known as Function.	(1) In this Programming Language Program is also divided into small parts known is Objects.
(2) In this programming Language, Program is divided into small parts known as Function. example: C, VB, FORTRAN Pascal	(2) In this programming Language. Program is also divided into small parts known as Objects. For example: C++ JAVA, VB. NET.

Q.3. What is the difference between a keyword and an identifier?  
 Ans. Keywords are predefined reserved words, which possess special meaning for programming language this meaning can't be changed.

Whereas an identifier is a unique name given to a particular variable, function or class name in the programming language.

Q.4. Evaluate the following C++ expressions where n, b, c are integers and d, f are floating point numbers. The values are

n = 3, b = 5 and d = 1.5.

a)  $c = n++ + b * ++d$

b)  $f = b * b++ + ++n$

Ans. (a) Value: 15

(b) Value: 20

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

(a) The average marks in a class

(b) The number of students in the class

(c) The registration letter of a car

(d) The population of a city.

Ans. (a) float

(b) integer

(c) String

(d) integer

Q.6. List four important operations associated with linear data structure. Describe each.

Ans. There are four important operations that can be performed on Linear data structure

1. Insert: used to insert a data.

2. Delete: used to delete a data.

3. Sort: used to sort the data.

4. Search: used to search a data.

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

Ans. Step 1: count = 0

Save = first

Step 2: repeat step 3 while save ≠ null

step 3: count + 1

save = save->link

step 4: return count

Q.8. How many types of users work on database system?

Ans. There are four types of Database users

(1) Database Administrator user

(2) Database Configuration/Designer user

(3) End user

(4) System Analyst and Application programmer

Q.9. Prepare a truth table for  $XYZ + Y\bar{Z} + \bar{X}Z$ .

Ans. hand written answer

Q.10. What are repeaters?

Ans. A repeater is an electronic device in a communication channel that increases the power of a signal and retransmits it, allowing it to travel further with strong signal.

### Section - C

#### Long Answer Questions :

Q.11. What are the advantages offered by inheritance?

Ans. Inheritance is a way of creating a new class from existing class to inherit all the properties and behavior of the existing class, where existing class is known as base class and new class is known as a derived class.

Advantages of inheritance

- **Code reusability:** It provides code reusability facilities by derived class from an existing class.
- **Extendability:** we can extend the existing class by some new features in new class.
- **Maintainability:** it is easy to debug and maintain a program

Q.12. Write the output of the following program:

```
#include <iostream.h>
void main ()
int x=5, y=5;
cout << x++ ;
cout << ", " ;
cout << ++x ;
cout << ", " ;
cout << y++ << ", " << ++y ;
```

Ans. 12. Output.

5, 7, 6, 6

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

Ans. #include <iostream.h>

#include <conio.h>

class sum

{

private:

int i, n[5], s;

public:

sum ()

{

cout << "Enter any five numbers=";

for(i=0; i<5; i++)

{

cin >> n[i];

}

}

void process ()

{

s=0;

for(i=0; i<5; i++)

{

s=s+n[i];

}

cout << endl << "Sum of five number=" << s;

}

};

void main ()

{

clrscr ();

sum obj;

obj.process();

getch();

}

output:

Enter any five Numbers:20

30

40

50

60

Sum of five number:200

**Q.14. What is an inheritance? What are the different types of inheritance supported by C++?**

**Ans.** Inheritance is a way of creating a new class from existing class to inherit all the properties and behavior of the existing class, where existing class is known as base class or parent class and new class is known as a derived class or child class.

Types of inheritance in C++

- (i) Single inheritance
- (ii) Multilevel inheritance
- (iii) Multiple inheritance
- (iv) hierarchical inheritance
- (v) hybrid inheritance

**Q.15. An electricity board charges according to following rates:  
For the first 100 units - Rs. 2 per unit  
For the next 200 units - Rs. 3 per unit  
Beyond 300 units - Rs. 4 per unit  
All users are charged meter charge also, which is Rs. 50.  
Write a program in C++ to read the number of units consumed and print out the charges.**

```

Ans. #include<iostream.h>
#include<conio.h>
void main()
{
int unit,e_bill;
cout<<"Enter the consumed unit;";
cin>>unit;
if(unit<=100)
{
e_bill = 50+unit*2;
}
else
{
e_bill = 50+200+(unit-100)*3;
}
else if(unit<=300)
{
e_bill = 50+200+600+(unit-300)*4;
}
cout<<"your electricity Bill is: "<<e_bill;
getch();
}

```

16. Ans:

**Q.16. Evaluate the following postfix expression using a stack and show the contents of stack after execution of each operation:**

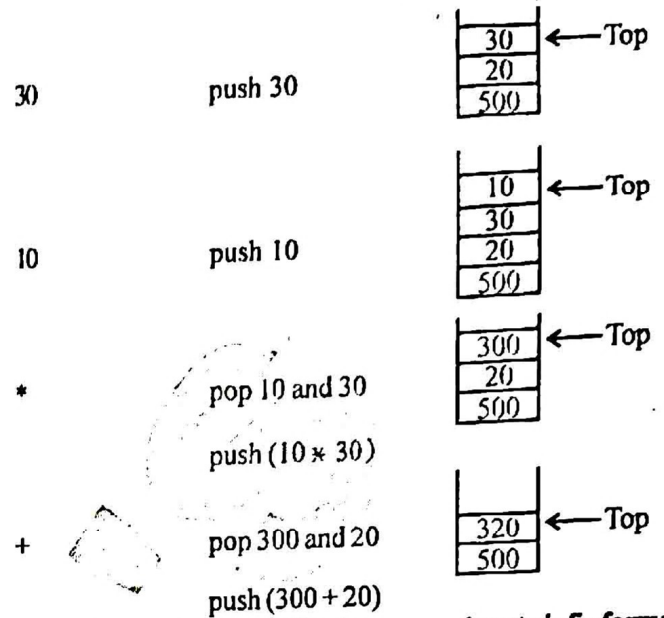
500, 20, 30, 10, \*, +.

**Ans.** Evaluate postfix expression

500, 20, 30, 10, x, +.

Token/symbol	operation	Stack
500	push 500	500 ← Top

20	push 20	20 500 ← Top
----	---------	-----------------



**Q.17. Transform each of the following expressions to infix form:**

- (a) + \* ABC
- (b) - + / AC ↑ D | EFG

**Ans.** (a) Reverse the prefix expression.

Symbol	Stack	infix
C	C	C
B	B	CB
A	A	CBA
*	*	CB * A
+	+	C + B * A

so, Expression C + B \* A  
New Reverse if

A \* B + C Ans

**Ans** (b) Reverse the expression

Symbol	Stack	Expression
G	G	G
F	F	GF
E	E	GFE
/	/	GF/E
D	D	G F/ED
↑	↑	G (F/E) ↑ D
C	C	G U/F) ↑ DC
A	A	G (F/F) ↑ DCA
/	/	G (F/E) ↑ DC/A
+	+	G (F/E) ↑ D+C/A
-	-	G - (F/E) ↑ D+ C/A

so Expression is G - (F/E) ↑ D+ C/A

new Reverse if

A/C+D ↑ (E/F)-G Ans.

**Q.18. Write an algorithm for Merge sort procedure.**

- Ans.** Step 1:  $l=0, j=0, k=0$   
Step 2: Repeat Step 3  
While  $l \leq N1 - 1$  and  $j \leq N2 - 1$   
If List 1 [I] < List 2 [J] then  
List 3 [K] = List 1 [I]  
 $I = I + 1$   
 $K = K + 1$

- Step 3: I ← I + 1  
 List 3 [K] ← List 2 [J]  
 J ← J + 1  
 K ← K + 1  
 Repeat Step 5
- Step 4: While I ← N1 - 1  
 List 3 [K] ← List 1 [I]
- Step 5: I ← I + 1  
 K ← K + 1
- Step 6: Repeat Step 7  
 while J ← N2 - 1  
 List 3 [K] ← List 2 [J]
- Step 7: J ← J + 1  
 K ← K + 1

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

Student No	Class	Name	Game1	Grade	Game2	Grade
10	7	Smith	Cricket	B	Swimming	A
11	8	Raju	Tennis	A	Skating	C
12	7	Kamlesh	Swimming	B	Football	B
13	7	Bina	Tennis	C	Tennis	A
14	9	Anjana	Basketball	A	Cricket	A
15	10	Apri	Cricket	A	Athletics	C

- (a) Display the names of the students who have grade C in either Game1 or Game2 or both.
- (b) Display the number of students getting Grade A in Cricket.
- (c) Display the names of students who have same game for both Game1 and Game 2.
- (d) Display the game taken up by the students, whose names start with A.
- Ans. (a) SELECT name FROM SPORTS  
 WHERE Grade = "C" OR Grade 2 = "C";
- (b) SELECT count (\*) from SPORTS  
 WHERE (Grade 1 = "A" AND Game 1 = "Cricket")  
 OR (Grade 2 = "A" AND Game 2 = "Cricket");
- (c) SELECT Name FROM SPORTS  
 WHERE Game 1, = Game 2;

(d) SELECT Game 1, Game 2 FROM SPORTS  
 WHERE Name like "A%";

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

$$F(A, B, C, D) = \sum (0, 1, 2, 3, 5, 7, 8, 9, 10, 11, 13, 15, )$$

Ans. First we will draw the k-map. Since there are four variable in the expression, the number of cells in the k-map will be  $2^4 = 16$

	AB	AB	AB	AB
CD	0	4	12	8
CD	1	5	13	9
CD	3	7	15	11
CD	2	6	14	10

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

Q.21. Why do we need to network our systems ?

- Ans. We need network our system to get lots of facilities and benefits form networking System. Because, computer networks allowing user to share and exchange the resources and data over the network system. Following benefits can get by network system
- \* Data Sharing
  - \* Resource sharing
  - \* Improving Storage efficiency and volume.
  - \* Access flexibility.
  - \* Reduce costs on softwere
  - \* Boosts storage capacity
  - \* File sharing easier.