



### USE SEPARATE ANSWER SHEET FOR EACH PART

#### PART – I

#### (OBJECT ORIENTED PROGRAMMING)

**NOTE: Attempt any THREE out of FOUR questions while Question No.1 is Compulsory.**

**Q.No.1**

Explain the following terms, explain with examples

- Inheritance
- Polymorphism
- interface
- abstract class

**Q.No.2**

```
// File Student.java
public class Student {
    private String name;
    private int rollNo;
    private static int countStudents = 0;
    // Standard Setters
    public void setName (String name) {
        this.name = name;
    }
    // Note the masking of class level variable rollNo
    public void setRollNo (int rollNo) {
        if (rollNo > 0) {
            this.rollNo = rollNo;
        }
        else {
            this.rollNo = 100;
        }
    }
    // Standard Getters
    public String getName () {
        return name;
    }
    public int getRollNo () {
        return rollNo;
    }
    // Note the masking of class level variable rollNo
    public void setRollNo (int rollNo) {
        if (rollNo > 0) {
            this.rollNo = rollNo;
        }
        else {
            this.rollNo = 100;
        }
    }
    // Standard Getters
    public String getName () {
        return name;
    }
    public int getRollNo () {
        return rollNo;
    }
    // Copy Constructor for a new student
    public Student(Student s) {
        name = s.name;
        rollNo = s.rollNo;
        countStudents += 1;
    }
}
```

```

}
// method used to display method on console
public void print () {
    System.out.print("Student name: " +name);
    System.out.println(", roll no: " +rollNo);
}
// overriding toString method of java.lang.Object class
public String toString(){
    return "name: " + name + " RollNo: " + rollNo;
}
// overriding finalize method of Object class
public void finalize(){
    countStudents -= 1;
}
} // end of class

```

```

// File Test.java
public class Test{
public static void main (String args[]){
    int numObjects;
    numObjs = Student.getCountStudents();
    System.out.println("Students Objects" + numObjects);
    Student s1 = new Student("ali", 15);
    System.out.println("Student: " + s1.toString());
    numObjs = Student.getCountStudents();
    System.out.println("Students Objects" + numObjects);
    // Creating second student object & printing its values
    Student s2 = new Student("usman", 49);
    System.out.println("Student: " + s2);
    numObjs = Student.getCountStudents();
    System.out.println("Students Objects" + numObjects);
    s1 = null
    System.gc();
    numObjs = Student.getCountStudents();
    System.out.println("Students Objects" + numObjects);
} //end of main
} //end of class

```

### Q.No.3

Create a class Song with public data members singer name, type and price.

- Create function 'input' in which you take input through scanner.
- Create function 'display' which display song information.

Call these functions from main method. Display your output.

Create a Rectangle with public data member length and width.

- Create function 'input' in which you take input through scanner.
- Create function 'area' which returns area of Rectangle.
- Create function 'perimeter' which returns perimeter of Rectangle.

Call these functions from main method. Display area and perimeter of Rectangle.

### Q.NO.4

A)

❖ Create a Student class having

#### ➤ Attributes

- Roll-Id (String)
- Name (String)
- CGPA (Double)
- Gender (String)

#### ➤ Member Functions

- Getter / Setter
- Display()

❖ Create another class StudentContainer having

➤ Attributes

- StudentList ( Student [ ] )
- NoOfStudents ( Int )

➤ Member Functions

- Int GetNoOfStudents( )
- Void AddStudent( Student studentObj)
- Void RemoveStudent( String rollId )
- Student SearchStudent( String rollId )
- Void DisplayStudent( String rollId )
- Void GetAverageCGPA( )
- Void DisplayAll( )

➤ Queries

- Display all Student having CGPA greater than 3.5
- Display all Student having CGPA between 3.0 and 3.5
- Display all male Students
- Display all female Students

**Q.NO.4**

**B)**

Write a program to show output given on bellow. You may run a loop 8 times. Use another variable initialize it by 1 and multiple by 10 each time inside loop.

```
10
1000
10000
100000
1000000
10000000
100000000
```

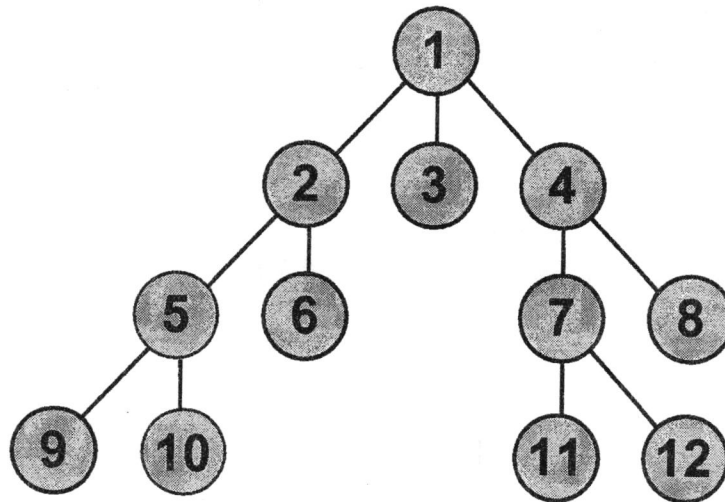
**PART – II**  
**(DATA STRUCTURE AND ALGORITHM)**

**NOTE: Attempt any THREE out of FOUR questions.**

**Q.NO.5**

Apply following algorithm on the following tree

- BFS
- DFS



**Q.NO.6**

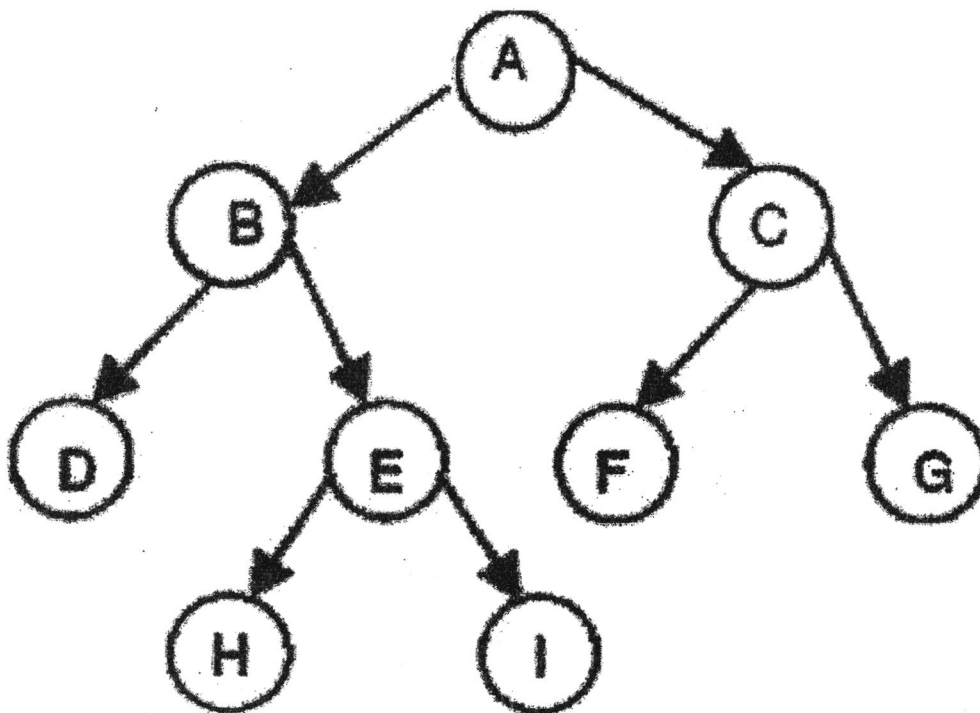
1. Consider an array {12,31,51,3,15,6,33,13} and sort by insertion sort and show the procedure step by step
2. Write the Pseudo code for bubble sort

**Q.NO.7**

Given the values {2341, 4234, 2839, 430, 22, 399, 3920}, a hash table of size 7, and hash function  $h(x) = x \text{ mod } 10$ , show the resulting tables after inserting the values in the given order with each of these collision strategies.

**Q.NO.8**

Write inorder, preorder, postorder traversals for the following binary tree





# UNIVERSITY OF THE PUNJAB

M.Sc. I.T. (First Year) 2<sup>nd</sup> Annual – 2019

Paper: V (Data Communication and Computer Networks +

Roll No. ....

Time: 2 Hrs. & 30 Min. Marks: 20



# UNIVERSITY OF THE PUNJAB

M.Sc. I.T. (First Year) 2<sup>nd</sup> Annual – 2019

Paper: III (Writing Workshop +  
Business and Technical Communication)

Time: 30 Min. Marks: 20

Roll No. in Fig. ....

Roll No. in Words. ....

Signature of Supdt.:

Attempt this Paper on this Question Sheet only.

Division of marks is given in front of each question.

This Paper will be collected back after expiry of time limit mentioned above.

### Question 1.

Supply the correct form of the verbs given in parenthesis in the following sentences. (5x1=5)

- i. He will have finished his speech before the chief \_\_\_\_\_ (arrive)
- ii. All the data \_\_\_\_\_ analysed. (be)
- iii. The manager and coach \_\_\_\_\_ present in the meeting. (be)
- iv. He behaves as if he \_\_\_\_\_ the director. (be)
- v. I asked him if he \_\_\_\_\_ me. (help)

### Question 2.

Answer the following questions.

(5+5+5)

- i. What is meant by 'Slanted Statement'? Explain it with the help of examples.

---

---

---

---

---

- ii. Elaborate Semantic Barriers to communication.

---

---

---

---

---

- iii. What is the significance of editing and proofreading in the composition of a message?

---

---

---

---

---



# UNIVERSITY OF THE PUNJAB

M.Sc. I.T. (First Year) 2<sup>nd</sup> Annual – 2019

Paper: V (Data Communication and Computer Networks + Internet Architecture and Protocols)

Time: 30 Min. Marks: 20

Roll No. in Fig. ....

Roll No. in Words. ....

Signature of Supdt.:

**Attempt this Paper on this Question Sheet only.  
Division of marks is given in front of each question.**

**This Paper will be collected back after expiry of time limit mentioned above.**

**Q.1.(a) Write your selected option (True / False) only on your answer sheet against each of the following. (1x10=10)**

i.	Intrusion refers to confidentiality and integrity of data.	True/False
ii.	A server can run on workstation computer.	True/False
iii.	Wireless networking is insecure.	True/False
iv.	A Hub connects two different lanes.	True/False
v.	A standard protocol of internet is Ethernet.	True/False
vi.	The simplest form of a network is a client/server network.	True/False
vii.	Very large peer-to-peer networks have emerged to take advantage of the Internet.	True/False
viii.	Network functions are associated with only one layer of the OSI model.	True/False
ix.	Not all Transport layer protocols are concerned with reliability.	True/False
x.	Ethernet is an example of a baseband system found on many LANs.	True/False

**(b) Answer the following short questions.**

**(5x2=10)**

i. Differentiate between FDM and TDM

---

---

---

---

ii. What are the different classes of IP address and its ranges.

---

---

---

---

iii. Which is the error message reported by ICMP?

---

---

---

---

iv. What is ICMP attack?

---

---

---

---

v. What is unicast, multicast and broadcast communication.

---

---