

# INTRODUCTION TO OBJECT-ORIENTED PROGRAMMING

## **Multiple Choice Type Questions**

1. Which one of the following statements is wrong? [WBUT 2012, 2015]
- a) A base class reference can refer to an object of a derived class
  - b) The dynamic method dispatch is not carried out at the run time
  - c) The super( ) construct refers to the base class constructor
  - d) The super.base-class-method-name ( ) format can be used only within a derived class

Answer: (b)

2. Out of the following which one is not correctly matched? [WBUT 2012, 2015]
- a) Int – 24 bits
  - b) Short – 16 bits
  - c) Double – 64 bits
  - d) Byte – 8 bits

Answer: (a)

## **Short Answer Type Questions**

1. What do you mean by object-oriented programming? [WBUT 2004, 2007]

How is it different from conventional procedural/structural programming? [WBUT 2004, 2005, 2007]

OR,

List out the differences between Procedure Oriented Programming and Object Oriented programming. [WBUT 2017]

Answer:

A type of programming in which programmers define not only the data type of a data structure, but also the types of operations (functions) that can be applied to the data structure. In this way, the data structure becomes an *object* that includes both data and functions. In addition, programmers can create relationships between one object and another. For example, objects can *inherit* characteristics from other objects.

To perform object-oriented programming, one needs an *object-oriented programming language (OOPL)*. Java, C++ and Smalltalk are three of the more popular languages, and there are also object-oriented versions of Pascal.

| PROCEDURAL LANGUAGE  | OBJECT ORIENTED LANGUAGE   |
|--|--|
| i) More concerned with the processing of procedures and functions. | i) Concerned to develop an object or application based on real time.   |
| ii) It is not applicable to procedural language.                   | ii) More emphasis is given on data rather than procedures, while the programs are divided into Objects and the data is encapsulated (Hidden) from the external environment, providing more security to data. |

# OBJECT-ORIENTED ANALYSIS & DESIGN

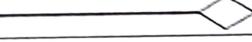
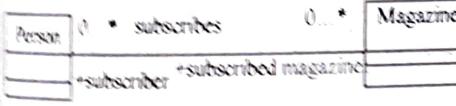
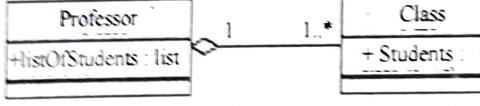
## Multiple Choice Type Questions

1. Relation name aggregation means [WBUT 2009]  
 a) association between two logically unrelated classes  
 b) inheritance c) part - of d) none of these  
 Answer: (c)

## Short Answer Type Questions

1. Differentiate between association and aggregation. [WBUT 2006, 2007, 2018]

Answer:

| ASSOCIATION  | AGGREGATION  |
|--|--|
| i) association is a relationship between two objects.  | i) Aggregation is a special case of association.   |
| ii) association defines the multiplicity between objects. for example one-to-one, one-to-many, many-to-one, many-to-many all these words define an association between objects | ii) A directional association between objects. When an object 'has-a' another object, then you have got an aggregation between them. Direction between them specified which object contains the other object. Aggregation is also called a "Has-a" relationship. |
| iii) Denoted by,   | iii) Denoted by,   |
|   |   |
| iv)  | iv)  |
| <br>Class diagram example of association between two class                                   | <br>Class diagram showing Aggregation between two classes   |

2. Differentiate between composition and aggregation with suitable example.

[WBUT 2007, 2011]

Answer:

Aggregation differs from ordinary composition in that it does not imply ownership. In composition, when the owning object is destroyed, so are the contained objects. In aggregation, this is not necessarily true. For example, a university owns various departments (e.g., chemistry), and each department has a number of professors. If the university closes, the departments will no longer exist, but the professors in those departments will continue to exist. Therefore, a University can be seen as a composition of departments, whereas departments have an aggregation of professors. In addition, a

**JAVA FUNDAMENTALS****Multiple Choice Type Questions**

1. int values [ ] = {1, 2, 3, 4, 5, 6, 7, 8} ;  
 for (int i = 0; i < X; ++ i)

System.out.println (values [ i ]);

Referring to the above, what value for X will print all members of array "values"?

- a) 1      b) 7      c) 8      d) 9

- e) None, since there is a syntax error in the array declaration

[WBUT 2008]

**Answer:** (c) It is because of ++i

2. What is the correct ordering for the import, class and package declarations when found in a single file? [WBUT 2010, 2012, 2015]

- a) package, import, class  
 c) import, package, class

- b) class, import, package  
 d) package, class, import

**Answer:** (a)

3. What will be the result of compiling the following code? [WBUT 2010]

```
public class Test {
    public static void main (String args[]) {
        int age;
        age = age + 1;
        System.out.println("The age is" + age);
    }
}
```

- a) Complies and runs with no output  
 b) Complies and runs printing out The age is 1  
 c) Complies but generates a run time error  
 d) Does not compile  
 e) Compiles but generates a compile time error

**Answer:** (d), variable age is not initialized.

4. What is the legal range of a byte integral type?

- a) 0 – 65, 535      b) (-128) – 127      c) (-32, 768) – 32, 767

[WBUT 2010]

**Answer:** (b)

d) (-256) – 255

5. Which of the following returns true? [WBUT 2010]

- a) "john" == "john"  
 c) "john" = "john"

- b) "john".equals("john")  
 d) "john".equal(new Button ("john"))

**Answer:** (a) and (b)

6. Which of the following do not lead to runtime error? [WBUT 2010]

- a) "john" + "was" + "here"  
 c) 3 + 5

- b) "john" + 3  
 d) 5 + 5.5

**Answer:** none of the above

7. Which code declares class A to belong to the mypackage.financial package?  
 ✓ a) package mypackage.;  
 b) import mypackage.;  
 c) package mypackage.financial;  
 d) import mypackage.financial.A;  
 e) package mypackage.financial.
- [WBUT 2011]

Answer: (c)

8. A package is a collection of  
 a) Classes                    b) Interfaces                    c) Editing tools                    d) both (a) and (b)
- [WBUT 2011]

9. Which of the following statements is valid array declaration?  
 a) int number ()      b) float average []      c) int marks      d) count int []
- [WBUT 2011]

- Answer: (b)
10. What is the output of this code fragment?  
 1. int x = 3; int y = 10;  
 2. System.out.println (y% x);  
 a) 0                            b) 1                            c) 2                            d) 3
- [WBUT 2012, 2015]

- Answer: (b)
11. Which three form part of correct array declarations?  
 1. public int a []                    2. static int [] a                    3. public [] int a  
 4. private int a [3]                    5. private int [3] a []                    6. public final int [] a  
 a) 1, 3, 4                            b) 2, 4, 5                            c) 1, 2, 6                            d) 2, 5, 6
- [WBUT 2013]

12. Which cause a compiler error?  
 ✓ a) int [] scores = {3, 5, 7};  
 b) int [][] scores = {2, 7, 6}, {9, 3, 45};  
 c) String cats [] = {"Fluffy", "Spot", "Zeus"};  
 d) boolean results [] = new Boolean [] {true, false, true};  
 e) Integer results [] = {new Integer (3), new Integer (5), new Integer (8)};
- [WBUT 2013]

Answer: (b)

13. Which two cause a compiler error?  
 1. float [] f = new float (3);  
 2. float f2[] = new float [];  
 3. float []f1 = new float [3];  
 4. float f3 [] = new float [3];  
 5. float f5 [] = {1.0f, 2.0f, 2.0f};  
 a) 2, 4                            b) 3, 5                            c) 4, 5                            d) 1, 2
- [WBUT 2013]

Answer: (d)

## POPULAR PUBLICATIONS

14. Byte code of java is [WBUT 2014]  
a) platform dependent  
c) no specific rule  
d) platform independent  
Answer: (b)
15. Java virtual machine is [WBUT 2014, 2015]  
a) platform dependent totally  
c) depends on machine architecture only  
b) independent  
d) depends on OS only  
Answer: (c)
16. Java is robust because [WBUT 2014]  
a) it is object oriented  
c) platform independent  
b) garbage collection is present  
d) exception handling  
Answer: (d)
17. Which of the following cannot be used for a variable name in Java? [WBUT 2016]  
a) Identifier  
c) Identifier & Keyword  
b) Keyword  
d) None of these  
Answer: (b)
18. What is the range of the char type? [WBUT 2016]  
a) 0 to  $2^{16}$       b) 0 to  $2^{15}$       c) 0 to  $2^{16} - 1$       d) 0 to  $2^{15} - 1$   
Answer: (a)
19. The import statement is always [WBUT 2016]  
a) the first non-comment statement in a java program file  
b) the default non-comment statement in java program file  
c) a non-comment statement and can be defined anywhere in the program  
d) none of these  
Answer: (a)
20. Which of the following values can a Boolean variable contain? [WBUT 2016]  
a) True & False  
c) Any integer value  
b) 0 & 1  
d) True  
Answer: (a)
21. Whether Java need compiler or interpreter [WBUT 2017]  
a) compiler  
c) both (a) and (b)  
b) interpreter  
d) none of these  
Answer: (c)
22. Does any Java program contains more than one main method? [WBUT 2017]  
a) Yes  
c) Sometimes it is possible  
b) No  
d) In different package  
Answer: (a)
24. AWT package is uses for [WBUT 2017]  
a) Component and graphics  
c) Graphics  
b) Component  
d) None of these  
Answer: (a)

[WBUT 2018]

**25. What is bytecode in context of Java?**

- a) The type of code generated by a Java compiler
- b) The type of code generated by Java Virtual Machine
- c) It is another name for a Java Source file
- d) It is the code written within the instance methods of a class

**Answer:** (b)

### Short Answer Type Questions

**1. Explain "public static void main(String args [] )" in brief.**

[WBUT 2007, 2009, 2010, 2011]

**Answer:**

1. public - declares that the main method is publicly accessible to other classes
2. static - declares that the main method can be invoked without creating an instance of the class. The main( ) is loaded in static memory by java runtime loader at the time of class loading. And main() starts execution automatically.
3. void - declares that the main method does not return any value.
4. main - defines the name of the method
5. String[] args - defines a parameter to the main method which will contain any command line options passed by the user when invoking the program.

**A small example:**

```

class best
{
    public static void [b]main(String[] s)
    {
        System.out.println("good");
    }
}

```

[WBUT 2007, 2009, 2010]

**2. What is JVM?**

OR,

[WBUT 2011]

**Explain function of a JVM in brief.**

OR,

[WBUT 2013]

**What do you mean by JVM?****What do you mean by Java is a platform dependent language?**

[WBUT 2007, 2009, 2010]

**Answer:**

JAVA is not platform dependent language.

The 2<sup>nd</sup> Part question statement is wrong.

At the heart of the Java platform lies the Java Virtual Machine, or JVM. Most programming languages compile source code directly into machine code, suitable for execution on a particular microprocessor architecture. The difference with Java is that it uses bytecode - a special type of machine code.

Java bytecode executes on a special type of microprocessor. Strangely enough, there wasn't a hardware implementation of this microprocessor available when Java was first released. Instead, the processor architecture is emulated by what is known as a "virtual

# OPERATORS AND FLOW OF CONTROL

## **Multiple Choice Type Questions**

1. Which of the following are correct?

- a)  $128 >> 1$  gives 64
- b)  $128 >>> 1$  gives 64
- c)  $128 >> 1$  gives -64
- d)  $128 >>> 1$  gives -64

Answer: (a)

[WBUT 2010]

2. What results from the following fragment of code?

[WBUT 2012]

1. int x = 1
  2. String [] names = {"Fred", "Jim", "Sheila"};
  3. names[-x] += ".";
  4. for (int i = 0 ; i < names.length ; i++) {
  5. system.out.println (names [i]);
  6. }
- a) the output includes Fred. with a trailing period
  - b) the output includes Jim. with a trailing period
  - c) the output includes Sheila. with a trailing period
  - d) none of the outputs shows a trailing period
  - e) an **ArrayIndexOutOfBoundsException** is thrown

Answer: (a)

## **Short Answer Type Questions**

1. What is Implicit and Explicit Casting? Explain with the help of an example.

[WBUT 2011, 2012]

Answer:

**Implicit casting** is the process of simply assigning one entity to another without any transformation guidance to the compiler. This type of casting is not permitted in all kinds of transformations and may not workout for all application scenarios.

Example:

int i = 4000;

long h = i; //Implicit casting

**Explicit casting** is the process in which the compiler are specifically informed to about transforming the object.

Example:

long ln = 700.20;

t = (int) ln; //Explicit casting

2. Differentiate between **charAt()** and **setCharAt()**.

[WBUT 2018]

Answer:

i) The **charAt()** method is used to get a character at the specified index in the sequence. Whereas,

# **CLASSES AND OBJECTS**

## Multiple Choice Type Questions

1. Examine the following class definitions to detect errors, if any abstract class 1  
 {abstract void func1 (float x, float y) {} }

- a) Class header definition is wrong
- b) Method definition is wrong
- c) Constructor needs to be defined
- d) No errors

[WBUT 2007]

Answer: (b); should be abstract void func1 (float x, float y);

2. All classes in Java are the sub-class of

- a) Final class
- b) Object class
- c) Static class

[WBUT 2007, 2018]

- d) Super class

Answer: (b)

3. The qualifier is a part of the

- a) class
- b) association class
- c) association path
- d) none of these

[WBUT 2007]

Answer: (a) & (b)

4. What is the error in the following code?

[WBUT 2007, 2009]

```
class Test {
    abstract void display () ;
}
```

- a) No error
- b) Method display () should be declared as static
- c) Test class should be declared as abstract
- d) Test class should be declared as public

Answer: (c)

5. In which class is the wait ( ) method defined?

[WBUT 2007, 2018]

- a) Applet
- b) Runnable
- c) Thread

- d) Object

Answer: (d)

6. Which of the following keywords are used to control access to a class Member?

6. Which of the following keywords are used to control access to a class Member? [WBUT 2007]

- a) default
- b) abstract
- c) public
- d) interface

Answer: (c); default is not a keyword

[WBUT 2008]

```
7. int j;
for (int i = 0; i < 14; i++) {
    if (i < 10) {
        j = 2 + i ;
    }
    System.out.println ("j: " + j + " i: " + i );
}
```

POPULAR PUBLICATIONS

What is WRONG with the above code?

- a) Integer "j" is not initialized
- b) Nothing
- c) You cannot declare integer i inside the for-loop declaration
- d) The syntax of the "if" statement is incorrect
- e) You cannot print integer values without converting them to strings

Answer: (a)

8. Which statement about static inner classes is true? [WBUT 2008]

- a) Static inner classes may access any of the enclosing classes' members
- b) Static inner classes may have only static methods
- c) Static inner classes may not be instantiated outside of the enclosing class
- d) Static inner classes do not have a reference to the enclosing class

Answer: (a)

9. Select the most appropriate answer. [WBUT 2010]

- ```
public void Base( ) {  
    System.out.println("Base");  
}  
public class In extends Base {  
    public static void main(String argv[ ]) {  
        IN i = new In( );  
    }  
}
```
- a) Compile time error Base is a keyword
  - b) Compilation and no output at run time
  - c) Output of Base
  - d) Run time error Base has no valid constructor.

Answer: (b)

10. Under what situations do you obtain a default constructor?

[WBUT 2010]

- a) When you define any class
- b) When the class has no other constructors
- c) When you define at least one constructor
- d) None of these

Answer: (a)

11. The use of protected keyword to a member in a class will restrict its visibility as

- a) Visible only in the class and its subclass in the same package
- b) Visible only inside the same package
- c) Visible in all classes in the same package and subclasses in other package
- d) None of these

[WBUT 2011]

Answer: (a)

12. Which of the following is a Wrapper class?

[WBUT 2011]

- a) Byte
- b) Random
- c) Vector
- d) String

Answer: (a)

13. A sub-class having more than one super class is called [WBUT 2012]  
a) category      b) Classification    c) Combination      d) Partial participation

Answer: (a)

14. Which one of the following statements is not correct? [WBUT 2012]  
a) An interface can inherit another interface  
b) The package name and subdirectory name need not be identical  
c) Only the classes declared as public in a package are accessible outside that package  
d) The import java.awt.\*; directive will not import classes in java.awt.event package

Answer: (d)

15. If a data-item is declared as a protected access specifier then it can be accessed [WBUT 2012]  
a) anywhere in the program      b) by the base and derived classes  
c) only by base classes      d) only by derived classes

Answer: (b)

16. **public class Test {}**  
What is the prototype of the default constructor? [WBUT 2013]  
a) Test ()      b) Test (void)      c) public Test ()    d) public Test (void)

Answer: (c)

17. What is the most restrictive access modifier that will allow members of one class to have access to members of another class in the same package?  
a) public      b) abstract      c) protected      d) synchronized    e) default access [WBUT 2013]

Answer: (e)

18. You want a class to have access to members of another class in the same package. Which is the most restrictive access that accomplishes this objective?  
a) public      b) private      c) protected      d) default access [WBUT 2013]

Answer: (d)

19. Constructor can be overloaded [WBUT 2014, 2015]  
a) never      b) always      c) partially      d) either (b) or (c)

Answer: (b)

20. What is the output of this program? [WBUT 2016]

```
class area {
    public static void main (String args[])
    {
        double r, pi, a;
        r=9.8;
        pi=3.14;
```

```
a=pi*r*r;
System.out.println(a);
}
```

- a) 301.5656      b) 301      c) 301.56      d) 301.56560000

Answer: (a)

21. How many public class can be allowed in Java?

- a) One      b) Two      c) Many

[WBUT 2017]  
d) None of these

Answer: (a)

22. Which of the following statements regarding static methods are correct?

[WBUT 2018]

- a) Static methods are difficult to maintain, because you cannot change their implementation
- b) Static methods can be called using an object reference to an object of the class in which this method is defined
- c) Static methods are always public, because they are defined at class-level
- d) Static methods do not have direct access to non-static methods which are defined inside the same class

Answer: (b)

23. Given the flowing piece of code

[WBUT 2018]

```
public class C{
public abstract double calc_sa( );
}
```

Which of the following statements is true?

- a) The keywords public and abstract cannot be used together
- b) The method calc\_sal() in class C must have a body
- c) Must add a return statement in method calc\_sal()
- d) Class C must be defined abstract

Answer: (d)

24. A subclass is placed in a different package than the super class. In order to allow the subclass access a method defined in the super class, identify the correct access specifiers(s)

[WBUT 2018]

- a) protected      b) public      c) private

d) default

Answer: (c)

### **Short Answer Type Questions**

1. Explain various access modifiers (public, protected, private, default) in a class definition.

[WBUT 2006]

OR,

What is the difference between default access specifier and public access specifier?

Explain the differences between the 'private' and 'protected' access specifier in java.

[WBUT 2013]

# **INHERITANCE AND POLYMORPHISM**

## **Multiple Choice Type Questions**

1. The method int func (int i, int j) ( ) can be overloaded using [WBUT 2007]
- a) int func (int i, int j, int k) {}
  - b) int func(float i, float j) {}
  - c) float func (int i, int j) {}
  - d) int func (int a, int b) {}
  - e) float func (int i, int j, float k) {}
    - a) (b) & (c)
    - b) (c) & (d)
    - c) (a), (b), (c) & (e)
    - d) (a), (b), & (e)

Answer: (d)

2. Which one of the following is a valid declaration of an applet? [WBUT 2007]
- a) public class MyApplet extends java.applet.Applet {
  - b) public Applet MyApplet {
  - c) public class MyApplet extends Applet implements Runnable {
  - d) abstract class My Applet extends java.applet.Applet {

Answer: (a) & (c)

3. Exception is defined in .....package. [WBUT 2007, 2009, 2018]
- a) java.util
  - b) java.lang
  - c) java.awt
  - d) java.io

Answer: (b)

4. The concept of multiple inheritance is implemented in java by [WBUT 2007]
- a) extending two or more classes
  - b) extending one class and implementing one or more interfaces
  - c) implementing two or more interfaces
  - d) All of these

Answer: (b) & (c)

5. Which of the options matches the following line: [WBUT 2008]
- The scheme for representing the relationships between classes
- a) method
  - b) inheritance
  - c) message
  - d) polymorphism

Answer: (b)

6. If a base class has a method defined as [WBUT 2009]
- abstract void method();
- Which of the following lines is mandatory in the derived class?
- a) void method( ) {}
  - b) int method ( ) {return 0;}
  - c) void method (int i) {}
  - d) private void method ( ) {}

Answer: (a)

7. What is the correct declaration of an abstract method that is intended to be public? [WBUT 2010]

- a) public abstract void add ()
- b) public abstract void add () {}
- c) public abstract add () .
- d) public virtual add ()

Answer: (a)

8. Consider the class

[WBUT 2011]

```
1. Public class Over {  
2.     public int test (int a, int b)  
3. }  
4. // add here  
5. }
```

Which of the following overloaded methods would be legal if added at line 4?

- a) Public float test (float a, float b) {}
- b) Public int test (float a, float b) {}
- c) Public int test (int x, int y) {}
- d) Public float test (int a, int b) {}

Answer: (a) & (b)

9. Which three are valid method signatures in an interface?

[WBUT 2013]

- 1. private int getArea();
  - 2. public float get Vol(float x);
  - 3. public void main (String [] args);
  - 4. public static void main (String [] args);
  - 5. boolean setFlag (Boolean [] test);
- a) 1 and 2              b) 2, 3 and 5              c) 3, 4 and 5              d) 2 and 4

Answer: (b)

10. class A

[WBUT 2013]

```
{  
protected int method 1 (int a, int b)  
{  
    Return 0;  
}  
}
```

Which is valid in a class that extends class A?

- a) public int method 1 (int a, int b) {return 0;}
- b) private int method 1 (int a, int b) {return 0;}
- c) public short method 1 (int a, int b) {return 0;}
- d) static protected int method 1 (int a, int b) {return 0;}

Answer: (a)

11. Which is a valid declaration within an interface?

[WBUT 2013]

- a) public static short stop = 23;
- b) protected short stop = 23;
- c) transient short stop = 23;
- d) final void madness (short stop);

Answer: (a)

12. What is the narrowest valid return Type for method A in line 3? [WBUT 2013]  
public class ReturnIt

```
{  
    return Type method A (byte x, double y)/*Line 3*/  
{  
    Return (long)x/y*2;  
}  
}
```

- a) int                    b) byte                    c) long                    d) double

Answer: (d)

13. Runtime binding occurs

[WBUT 2014]

- a) when method overloaded  
c) class and interface

- b) interface only  
d) only subpackage

Answer: (c)

14. Abstract class is used for

[WBUT 2014]

- a) inheritance only  
c) both (a) and (b)

- b) instantiation only  
d) useless

Answer: (a)

15. What is an example of polymorphism?

[WBUT 2016]

- a) Inner class  
c) Method overloading

- b) Anonymous classes  
d) Method overriding

Answer: (c)

16. The relation between classes can be represented by

[WBUT 2016]

- a) polymorphism            b) method            c) message

- d) inheritance

Answer: (d)

17. Method overloading occurs only when

[WBUT 2016]

- a) the names and the type signature of two methods are not identical  
b) the names and the type signature of two methods are identical  
c) the names and the return types of two methods are identical  
d) only the names are identical

Answer: (b)

18. Final is useful

[WBUT 2017]

- a) to protect a method from overloading  
b) to protect a class from inherit  
c) to protect a interface from implementing  
d) none of these

Answer: (a) and (b)

## POPULAR PUBLICATIONS

19. Dynamic method dispatcher is useful for  
a) to resolve method override  
b) to resolve multilevel inheritance anomaly  
c) to resolve multiple inheritance anomaly  
d) none of these

[WBUT 2017]

Answer: (a)

20. An abstract class can contain no method at all  
a) True                  b) False                  c) Variable

[WBUT 2017]  
d) None of these

Answer: (b)

21. The parent class of all the exceptions in Java is  
a) Throwable            b) Throw                  c) Exception

[WBUT 2018]  
d) Throws

Answer: (c)

22. String univ = new String ("WBUT");  
System.out.print(univ.length());

[WBUT 2018]

What is printed?

- a) 6                  b) 4                  c) 8

d) WBUT

Answer: (b)

## **Short Answer Type Questions**

1. Differentiate between Early binding and late binding.

[WBUT 2010, 2018]

OR,

- What is the difference between static binding and dynamic binding? [WBUT 2011]

Answer:

### **Late Binding:**

- At run time, when it is known what class objects are under consideration, the appropriate version of function is invoked. Since the function is linked with a particular class much later after the compilation, this process is known as *late binding*. It is also known as *dynamic binding* because the selection of the appropriate function is done at run time dynamically. Dynamic binding requires use of pointers to objects.
- Late binding is implemented when it is not known which function will be called, though early binding is faster than late binding.

### **Early Binding:**

- The overloaded member functions are selected for invoking by matching arguments. The compiler knows this information at the compile time and, therefore, compiler is able to select appropriate function for a particular call at compile time itself. This is called *early binding* or *static binding* or *static linking*. This is also known as *compile time polymorphism*

# STRING AND STRING BUFFER

## Multiple Choice Type Questions

1. Consider the following class definitions:

[WBUT 2009]

```
class student extends String {  
}
```

What happens when we try to compile this class?

- a) will not compile because class body is not defined
- b) will not compile because the class is not declared "public"
- c) will not compile because string is "abstract"
- d) will not compile because string is "final"
- e) will compile successfully

Answer: (d)

2. Which of the following is correct?

[WBUT 2010]

- a) String temp [] = new String {"j" "a" "z"} b) String temp [] = {"j" "b" "c"}
- c) String temp = {"a", "b", "c"} d) String temp [] = {"a", "b", "c"}

Answer: (d)

## Short Answer Type Questions

1. What is mutable strings?

[WBUT 2005, 2015, 2016]

Answer:

Refer to Question No. 3(String Buffer) of Short Answer Type Questions.

2. Why is string type array used in the parameter of main ( ) method? [WBUT 2009]

Answer:  
A string type array is used to take multiple arguments in command line. Like java  
Program Name arg1 arg2 arg3.

3. Differentiate between String and String Buffer. [WBUT 2011, 2012, 2015, 2016]

OR,

How does string class differ from string buffer class? Explain with example. [WBUT 2015]

Answer:

Java provides the StringBuffer and String classes, and the String class is used to manipulate character strings that cannot be changed. Simply stated, objects of type String are read only and immutable. The StringBuffer class is used to represent characters that can be modified. The significant performance difference between these two classes is that StringBuffer is faster than String when performing simple concatenations. In String manipulation code, character strings are routinely concatenated. Using the String class, concatenations are typically performed as follows:

# EXCEPTION HANDLING

## Multiple Choice Type Questions

1. Exception is defined in ..... package.  
 a) java.util      b) java.lang      c) java.awt      d) java.io  
 [WBUT 2007, 2016]

Answer: (b)

2. public int m1 (int x) {  
 int count = 1;  
 try {  
 count += x;  
 count += m2 (count);  
 count ++;  
 }  
 catch (Exception e) {count = x;}  
 return count;  
}
- [WBUT 2008]

Referring to the above, when m1(2) is invoked, m2() throws an ArithmeticException and m1() returns which one of the following?

- a) 1      b) 2      c) 3      d) 4      e) The system will exit

Answer: (b)

3. How can you have a "try" block that invokes methods that throw two different exceptions?  
 [WBUT 2008]

- a) Catch one exception in a "catch" block and the other in a "finally" block
- b) Setup nested "catch" blocks for each exception
- c) Catch one exception in a "catch" block and the other via the return value
- d) Use wait ( ) between the calls to process all exceptions before continuing
- e) Include a "catch" block for each exception

Answer: (e)

4. How can you ensure that the memory allocated by an object is freed?

[WBUT 2009]

- a) By invoking the free method on the object
- b) By calling system.gc( ) method
- c) By setting all reference to the object to new values (say null)
- d) Garbage collection cannot be forced. The programmer cannot force the JVM to free the memory used by an object

Answer: (d)

5. Which exception is thrown by the read( ) method of inputStream class?

[WBUT 2009]

- a) Exception
- b) FileNotFoundException
- c) ReadException
- d) IOException
- e) None of these

Answer: (d)

6.

```
1. class Class 1 {  
2.     public static void main (String args [] ) {  
3.         int total = 0;  
4.         int [ ] i = new int [3];  
5.         for (int j = 1 : j <= i. length; j++)  
6.             total += (i [j] = j);  
7.         System.out.println (total);  
8.     }  
9. }
```

What is the output of the program above?

- a) 3
- b) 4
- c) 6
- d) None. The system will throw an Array Index Out. of Bounds Exception.
- e) None. The compiler will throw a syntax error on line 6.

Answer: (c)

7. Which of the following statements is correct?

[WBUT 2012, 2015]

- a) the 'try' block should be followed by a 'catch' block
- b) the 'try' block should be followed by a 'finally' block
- c) the 'try' block should be followed by either a 'catch' block or a 'finally' block
- d) the 'try' block should be followed by at least two 'catch' blocks

Answer: (c)

8. Stack over run is an

- a) error
- b) exception
- c) virus

[WBUT 2014, 2015]

- d) worm

Answer: (b)

### **Short Answer Type Questions**

1. How Throws and Throw are different? Explain.

[WBUT 2011, 2016]

OR,

Discuss the difference between 'throw' and 'throws' clause.

[WBUT 2013]

OR,

What is the difference between throws and throw?

[WBUT 2018]

Answer:

#### ***The throw clause***

The catch block however does not restrict the normal flow of execution, which is outside the try-catch block. But it is a good practice to stop further execution after an exception has occurred. In such a situation the **throw** clause is used explicitly to stop execution of a program flow after a try block throws an exception. We use the **throw** statement in **catch** block, where the exception is captured. The throw statement is used normally to throw checked exception like IOException, SQLException. Whenever a checked exception is thrown explicitly by a throw clause, we need to use the throws clause also in the method from where the exception is thrown.

## **JAVA INPUT/OUTPUT**

### **Multiple Choice Type Questions**

```
1. class Class1 {  
    static int i = 0;  
    public static void main (String args[ ]) {  
        for (int j = 1; j < args.length; j += 2) {  
            i += Integer.parseInt ( args[j] );  
        }  
        System.out.println(i);  
    }  
}
```

[WBUT 2008]

What parameters could be passed on the command-line so that the output of the program above is "6"?

- a) 1 2 3 4
- b) 6 5 1
- c) 6
- d) None. The system will throw an `ArrayIndexOutOfBoundsException`
- e) None. The compiler will issue an error message because an exception must be caught when invoking `parseInt()`

Answer: (a)

2. What type of the following stream is used to read binary data?

- a) `InputStream`
- b) `InputStreamReader`
- c) `DataInputStream`
- d) none of these

[WBUT 2012]

Answer: (a)

3. In `System.out.println();` out is

- a) a class
- b) output stream object
- c) method
- d) none of these

[WBUT 2014, 2015]

Answer: (b)

4. Scanner class resides in

- a) `java.io`
- b) `java.applet`

c) `java.util`

[WBUT 2014, 2015]

Answer: (a)

d) none of these

### **Long Answer Type Questions**

1. Write short note on String Tokenizer Class.

[WBUT 2012]

Answer:

The StringTokenizer class takes an input stream and parses it into "tokens", allowing the tokens to be read one at a time.

```
StringTokenizer sTokenize = new StringTokenizer(s, " ");  
while (sTokenize.hasMoreTokens()) {
```

# THREADS

## Multiple Choice Type Questions

1. When we implement the Runnable interface, we must define the method  
 a) start ()      b) init ()      c) run ()      d) runnable () [WBUT 2007]

Answer: (c)

2. Which one of the following statements is FALSE? [WBUT 2008, 2009]

- a) Java supports multi-threaded programming.
- b) Threads in a single program can have different priorities
- c) Multiple threads can manipulate files and get user input at the same time
- d) Two threads can never act on the same object at the same time
- e) Threads are created and started with different methods.

Answer: (d)

3. Which one of the following is the equivalent of main () in a thread?

[WBUT 2008, 2011]

- a) start ()      b) go ()      c) run ()      d) begin ()
- e) The class constructor

Answer: (c)

4. Which of the following statements is true?

[WBUT 2009]

- a) The wait method defined in the thread class can be used to convert a thread from running state to waiting state
- b) The wait( ), notify( ) and notify all( ) method must be executed in synchronized code
- c) the thread class is an abstract class
- d) None of these.

Answer: (a) and (b)

5. The methods wait ( ) and notify ( ) are defined in

[WBUT 2011]

- |                     |                       |
|---------------------|-----------------------|
| a) java.lang.string | b) java.lang.runnable |
| c) java.lang.object | d) java.lang.thread   |

Answer: (d)

6. The wait( ) and notify( ) methods are used to perform

[WBUT 2012, 2015]

- |                              |                    |
|------------------------------|--------------------|
| a) interthread communication | b) synchronization |
| c) deadlock                  | d) all of these    |

Answer: (b)

7. Which one of the following is wrong?

[WBUT 2012, 2015]

- a) 'Runnable' is a predefined interface
- b) The sleep( ) method instructs a thread to terminate its execution
- c) The isAlive( ) method tells whether a thread has not yet died
- d) MAX\_PRIORITY represents the level 10

Answer: (b)

**8. How dead thread can be accessed?**

- a) Using start ()
- c) Using recreate ()

- b) using notify ()
- d) None of these

[WBUT 2017]

**Answer:** (d)

**Short Answer Type Questions**

**1. Draw the state transition diagram of Java Thread.**

OR,

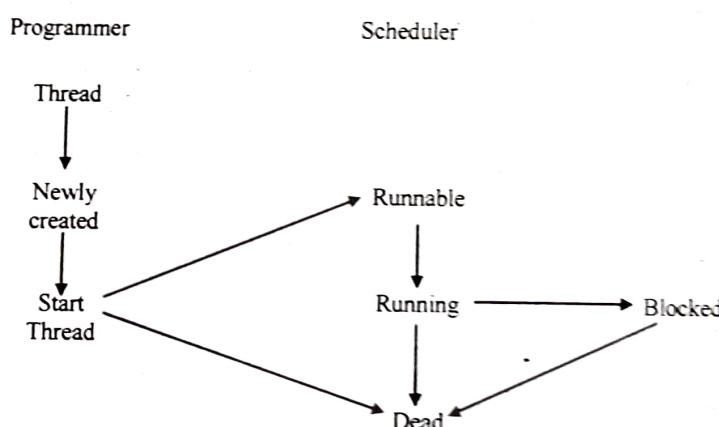
[WBUT 2003, 2009]

**What are the "thread state"?**

**Answer:**

[WBUT 2018]

Different states of a thread are:



1. **New state** – After the creation of Thread instance the thread is in this state but before the start() method invocation. At this point, the thread is considered not alive.
2. **Runnable (Ready-to-run) state** – A thread starts its life from Runnable state. A thread first enters runnable state after the invoking of start() method but a thread can return to this state after either running, waiting, sleeping or coming back from blocked state also. On this state a thread is waiting for a turn on the processor.
3. **Running state** – A thread is in running state that means the thread is currently executing. There are several ways to enter in Runnable state but there is only one way to enter in Running state: the scheduler selects a thread from runnable pool.
4. **Dead state** – A thread can be considered dead when its run() method completes. If any thread comes on this state that means it cannot ever run again.
5. **Blocked** – A thread can enter in this state because of waiting for resources that are held by another thread.

**2. Mention two methods by which you can stop a thread.**

[WBUT 2011]

**Answer:**

The simplest way to suspend a Java Thread is to directly call stop/suspend methods which was provided in basic class Thread, But it would not recommend this way as it is unsafe and thus deprecated. If a thread being stopped now is modifying common data that common data remains in an inconsistent state. However, we have some safest advices/solution:

# APPLETS

## Multiple Choice Type Questions

1. Which one of the following is a valid declaration of an applet?
- public class MyApplet extends java.applet.Applet {
  - public Applet MyApplet {
  - public class MyApplet implements Runnable {
  - abstract class My Applet extends Applet implements Runnable {
- Answer: (a) & (c)

2. The set Background ( ) method is part of which class?
- Graphics
  - Applet
  - Component
  - Object
- Answer: (b)

3. Applet can be used for generating
- static web page
  - dynamic webpage
  - active webpage
  - none of these
- Answer: (b)

4. Which one of the following is a valid declaration of an Applet?
- Public class MyApplet extends java.applet.Applet {
  - Public Applet MyApplet {
  - Public class MyApplet implements Runnable {
  - Abstract class MyApplet extends java.applet.Applet {
  - Class MyApplet implements Applet {
- Answer: (a) & (c)

5. Applet has main ( ) method
- False
  - True
  - Required for local applet
  - None of these
- Answer: (a)

6. Which tool is used to execute an applet
- java
  - javac
  - appletviewer
  - appletrunner
- Answer: (c)

## Short Answer Type Questions

1. Write an applet program to print "Welcome to my World" at any place on the screen.

Answer:

```
import java.applet.Applet;
import java.awt.Graphics;
import java.awt.Font;
import java.awt.Color;
/*

```