DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
B.TECH – SEMESTER – V, IT
SUBJECT: [IT 510] Core Java Technology

Examination	**:**	**First Sessional**	**Seat No.**	**:**	
Date	**:**	**02/08/2018**	**Day**	**:**	**Thursday**
Time	**:**	**11:45 to 01:00 PM**	**Max. Marks**	**:**	**36**

INSTRUCTIONS:
1. Figures to the right indicate maximum marks for that question.
2. The symbols used carry their usual meanings.
3. Assume suitable data, if required & mention them clearly.
4. Draw neat sketches wherever necessary.

Q.1 **Do as directed**. **[12]**

(a) Assume the following lines of code & give the output with justification. [2]

```
String s1="Hello World";
String s2=s1;
String s3=new String(s1);
if(s3.equals(s1)) {System.out.println("Equal");}
if(s3==s1){ System.out.println("s3 and s1 are having same reference");}
if(s2==s1){ System.out.println("s1 and s2 are having same reference");}
```

(b) 1. Which of these (A, B, C, or D) is an incorrect array declaration? [2]

A. int arr[] = new int[5]; B. int [] arr = new int[5]; C. int arr[]; arr = new int[5];
D. int arr[] = int [5] new;

2. What is stored in the variable obj in following lines of code?

```
Box obj;
```

A. Memory address of allocated memory of object
B. NULL
C. Any arbitrary pointer
D. Garbage

(c) 1. For 2-dimensional array, how can we find out the number of rows and the number of columns? [2]

2. Can we have 2-dimensional array having varying number of columns in each row? Answer using suitable example.

(d) Find out the error in the following code segments and correct them: [2]

(i)

```
interface Flyable{}
class AirPlane extends Flyable {}
class UseAirPlane{
   public static void main(String[] args){
      Flyable fObj=new Airplane();
   }
}
```

(ii)

```
class Box {
     int length, width, height;
     protected Box(int l, int w, int h){
        length=l; width=w; height=h;
     }
}
class EnBox extends Box{
    int weight;
    EnBox(int l, int w, int h, int wt){
       weight=wt;
    }
}
```

(e) If we make constructors as private, then how can we allow creating instances of such class? Write code fragment for above. [2]

(f) State True/False [2]
(i) A reference of an abstract class cannot be created.
(ii) Static methods can access *this* pointer.
(iii) An interface can inherit from only one interface.
(iv) One class can implement multiple interfaces.

Q.2 Attempt ***Any Two*** from the following questions. **[12]**

(a) 1. What conditions are needed to be satisfied to destroy the object from memory? How garbage collector plays an important role in execution? [3]
2. How recursive method can be defined? Explain using suitable example. [3]

(b) Write a java program, which reads an expression and outputs its value. Assume that parenthesis are not used. Assume all operations are left associative and all numbers are integers. Take only '+' and '*' as operators. e.g. for input 12+17*10, the output should be 290. [6]

(c) Create a class QueueDemo which has instance members front, rear & array of 20 integers. It has constructor to initialize the appropriate values of front, rear & array elements. Implement enqueue( ), dequeue( ) methods to insert element to queue and to delete element from queue. Also display the current data of queue by disp( ) method. Create a DemoTest class which has main( ) method, which creates objects for QueueDemo class and calls methods of it. [6]

Q.3 Attempt ***ALL*** from the following questions. **[12]**

(a) Explain with example ***up casting***, ***down casting***, and use of ***instanceof*** operator while we work with inheritance. [4]

(b) Write IStack interface declaring push() and pop() methods, which can work on a stack of float numbers. Implement this interface using float array as a storage of stack. Write code for the following:
IStack interface [1]
FloatStack class (implementation of IStack) [3]

(c) Explain with examples four uses of final keyword. [4]

OR

Q.3 Attempt ***ALL*** from the following questions. **[12]**

(a) Define GenericVector class, which can hold a generic vector and can allow addition and subtraction of two generic vectors. Define IntegerVector, which extends GenericVector and implements its abstract methods. Place appropriate methods/data members in both classes. Also write a class to test this IntegerVector class. [6]

(b) Write code fragments for the following requirements:
(i) There is a Box class containing length, width, height, and weight, all as integer numbers. Write the correct code to override the equals() method. We should be able to invoke equals() method using a reference of *Object* class. [3]
(ii) There are two classes: *WeatherService* and *WeatherConsumer*. The *WeatherConsumer* class uses *WeatherService* class. Answer the following in context of package: [3]
(a) The *WeatherService* class is in a package *Weather*. If the *WeatherConsumer* class is also placed in the same package, then what should be the first line in the definition of the *WeatherConsumer* class?
(b) The *WeatherService* class is in a package *Weather*. If the *WeatherConsumer* class is placed in a separate package, then what statements should be written in the *WeatherConsumer* class and what configuration of CLASSPATH should be done so that the *WeatherConsumer* class can access the *WeatherService* class?