



Name :

Roll No. :

Invigilator's Signature :

CS/B.TECH/IT(O)/SEM-5/IT-501/2012-13

2012

OBJECT TECHNOLOGY & UML

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

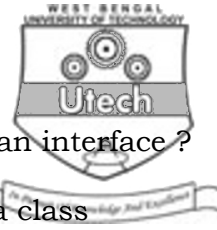
*Candidates are required to give their answers in their own words
as far as practicable.*

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : $10 \times 1 = 10$

- i) Relation name aggregation means
 - a) association between two logically unrelated classes
 - b) inheritance
 - c) part-of
 - d) none of these.
- ii) Swim lane is defined in
 - a) State Chart Diagram b) Use Case Diagram
 - c) Activity Diagram d) Sequence Diagram.



- iii) Which of the following is not true about an interface ?
- a) It can be partially implemented by a class
 - b) It can be implemented by an interface
 - c) It can be implemented by several classes
 - d) A particular class can implement several interfaces.
- iv) Dynamic method dispatcher is useful for
- a) resolving method overriding
 - b) resolving multilevel inheritance anomaly
 - c) resolving multiple inheritance anomaly
 - d) none of these.
- v)

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

What is the wrong with above code ?
- a) integer "j" is not initialized
 - b) nothing
 - c) you cannot declare integer 'i' inside the for-loop declaration
 - d) you cannot print integer values without converting to string.



- vi) Which of the following is true ?
- A class that is abstract must be containing all abstract methods
 - the final keyword indicates that the body of a method is to be found elsewhere
 - A static variable indicates there is only one copy of that variable
 - A method defined as private indicates that it is accessible to all other classes in the same package.
- vii) Under which circumstances will a thread stop ?
- The run() method that the thread is executing ends
 - The call of the start() method of thread object returns
 - The suspend() method is called on the thread object
 - The wait() method is called on the thread object.
- viii) class Test
- ```
{
 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);
 }
}
```
- What parameters could be passed on the command line so that the output of the program above is '6' ?
- 1 2 3 4
  - 6 5 1
  - 6
  - None of these.



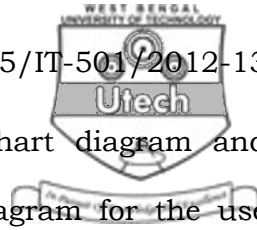
- ix) How can you have a 'try' block that invokes methods that throw two different exceptions ?
- a) Catch one exception in a 'catch' block and other in a 'finally' block
  - b) Set up nested 'catch' blocks for each exception
  - c) Catch one exception in a 'catch' block and other via the return value
  - d) use wait( ) between the calls to process all exceptions before continuing.
- x) Which of the following statements is true regarding constructors ?
- a) All classes must define a constructor
  - b) A constructor can be declared private
  - c) A constructor can return a value
  - d) A constructor must initialize all the fields of a class.

### GROUP – B

#### ( Short Answer Type Questions )

Answer any *three* of the following  $3 \times 5 = 15$

2. Can a super class object references a subclass object ?  
Explain. Illustrate the use of 'this' and 'super' keyword with example. What is the difference between abstract class and interface ?  $2 + 2 + 1$



3. What is the difference between state chart diagram and activity diagram ? Model and activity diagram for the use case of a driver starting a car.
4. What is method overloading ? Explain this concept with suitable example.
5. What is collaboration diagram ? Differentiate between collaboration and sequence diagrams.
6. How does object oriented programming differ from conventional programming ?

**GROUP – C**

**( Long Answer Type Questions )**

Answer any *three* of the following.  $3 \times 15 = 45$

7. a) Explain 'use case' diagram. What are the essential criteria for ideal 'use case' diagram ? What are the 'extends and includes' constructs in 'use case' diagram ?
- b) Why UML is called a modeling language ? What are the primary goals of UML ?
- c) Explain "public static void main (String args[ ])" in brief. What is wrapper class ?

$$( 1 + 2 + 2 ) + 5 + ( 3 + 2 )$$



8. a) Draw a sequence diagram for railway reservation system.

b) Differentiate between composition and aggregation with suitable example. 10 + 5

9. a) Design a program in java to overload a function `rect( )`.

i) `void rect (int n, char ch)`

ii) `void rect (int l, int b, char ch)`

Which one integer argument and one character argument draw filled square of side `n` using the character stored in `ch`. With two integer arguments and one character draw a filled rectangle of length `l` and breadth `b` using the character stored in `ch`.

b) What is inheritance ? How many types of inheritance java supports are there ? Explain each of them with suitable example.

c) What is multithreading ? Write a program which can run a main thread and child thread simultaneously.

$$4 + ( 1 + 3 ) + ( 2 + 5 )$$



10. a) Write a program to implement dynamic stack. Each stack is constructed with an initial length. If this length is exceeded, *i.e.* if more room is needed then the size of the stack is doubled.
- b) Write a Java program to compute and display the sum of all integers that are divisible by 6 but not divisible by 4 and lie between 0 and 100. The program should also count and display the number of such values.
- c) How two methods have same signature ?  $7 + 5 + 3$
11. Write short notes on any *three* of the following :  $3 \times 5$
- a) Runtime polymorphism in Java
  - b) JVM
  - c) Applet life cycle
  - d) Sequence diagram and its use
  - e) Dynamic method dispatch.

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