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) A class that is abstract must be containing all abstract methods

b) the final keyword indicates that the body of a method is to be found elsewhere

c) A static variable indicates there is only one copy of that variable

d) 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 ?

a) The `run( )` method that the thread is executing ends

b) The call of the `start( )` method of thread object returns

c) The `suspend( )` method is called on the thread object

d) 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 progam above is '6' ?

a) 1 2 3 4 b) 6 5 1

c) 6 d) 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 : 3×5

    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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