Q1. Write the following code and answer the following questions.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Class University // outer class

{

class Department // normal inner class

{

// object of department cannot exist without object of university class

} // relation between two classes is Has-A relation.

}

1. **After compiling the above code, how many .class files are generated? Two .class files generated.**
2. **List the name of the . Class files.**

**University.class and University$Department.class**

**Q2. Write the following code and answer the following questions**

**class Outer // outer class**

{

**class inner // non-static inner class**

**{**

**publics static void main(String[] args)**

**{**

**Sytem.out.println(“inner calls of main method” );**

**}**

}

}

**a) When you compile and run the above program, you will get an error? Why this**

**error is generated**

Yes, Its get a error, because the method main cannot be declared static, static mehods can only be declared in a static or top level type

b) Can a **non-static** inner class have a static method including main() ?

No, its can’t have it.

**Q3. The following code is a partial code. Complete the missing code to get the output.**

**class Outer**

{

**class Inner**

**{**

**publics void M1( )**

**{**

**Sytem.out.println(“inner class method is running” );**

**}**

**}**

**public static void main(String[] args)**

**{**

**// write your code**

**}**

}

**Output:** **inner class method is running**

**Question**: To get this output from the above code , write the missing code.

{

Outer.Inner in = **new Outer().new Inner();**

in.M1();

}

**Q4. The following code is a partial code. Complete the missing code to get the output.**

**class Outer**

{

**class Inner**

**{**

**publics void M1( )**

**{**

**Sytem.out.println(“inner class method is running” );**

**}**

**}**

**public void M2( )**

**{**

**// write your code**

**}**

**public static void main(String[] args)**

**{**

**// write your code**

**}**

}

**Output:** **inner class method is running.** To get this output from the above code , write the missing code.

{

Outer.Inner in = **new Outer().new Inner();**

in.M1();

}

{

Outer in = **new Outer();**

in.M2();

}

**Q5. The following code is a partial code. Complete the missing code to get the output.**

**class Outer**

{

**class Inner {**

**publics void M1( ) {**

**Sytem.out.println(“ inner class method is running” );**

**}**

**}**

**}**

**class TestClass**

**{**

**publics static void main(String[] args) // how main() method call M1()**

**{**

**// write your code**

**}**

**}**

**Output:** **inner class method is running.** To get this output from the above code , write the missing code.

Hint: How the **main()** method (belongs **TestClass** ) invoke method M1() ?

{

**Outer O =new Outer() ;**

**Outer.Inner i = O. new Inner() ;**

**i.M1();**

**}**

Change the main class with a TestClass in the Run configurations.

**Q6. Write and run the following code**

**class Outer**

{

**private int x =10; // member variable to outer class b**

**privat**e static **int y=20**; **// member variable to outer class**

**class Inner**

**{**

**publics void M1( )**

**{**

**Sytem.out.println(x );**

**Sytem.out.println(y );**

**}**

**}**

**publics static void main(String[] args) // method of outer class**

**{**

**Outer O =new Outer() ;**

**Outer.Inner i = O. new Inner() ;**

**i.M1();**

**}**

}

Question: from the output of the above code, a method (belongs to non-static inner class) can access fields of outer classes? **Why ?**

Yes, its can access it. because the main method output m1.

**Q7. The following code is a partial code. Complete the missing code to get the output.**

**Hint:** How a method of inner class solve Shadowing effect ?

System.***out***.println(""+ x);

**class Outer**

**{**

**int x =10;**

**class Inner**

**{**

**int x=20;**

**public void M1( )**

**{**

**int x =3 0;**

**Sytem.out.println(………………… ); // write the missing argument to display 30**

**Sytem.out.println(………………… ); // Write the missing argument to display 20**

**Sytem.out.println (………………… ); // write the missing argument to display 10**

**}**

**}**

**public static void main(String[] args)**

**{**

**// write your code**

**}**

} // end of outer

**Q8. Compile and run the following code.**

**class Outer**

**{**

**private int x=10;**

**private static int y=20 ;**

**publics void M1( )**

**{**

**int z=30;**

**class Inner**

**{**

**public void M2()**

**{**

**Sytem.out.println(“sum: ”+ (x+y+z));**

**}**

**}**

**Inner i=new Inner();**

**i.M2() ; /// first call**

**i.M2(); // second call**

**i.M2(); // third call**

**} // end of M1**

**publics static void main(String[] args)**

**{**

**Outer O = new Outer() ;**

**O.M1(); /// control starts from here**

**}**

**} // end of outer class**

Question:

1. Can method M2(belongs to local inner class) access the local variable z (local to method M1) ?

Yes, can access it.

1. **Explain your reason.**

Because can move the declaration of M2 from outer class into the body of M1, so we can access method M2 access the local variable z .

**Q9 : run the following code.**

**class A**

**{**

**publics void M1( )**

**{**

**Sytem.out.println(“ travel by plane ” );**

**}**

**publics void M2( )**

**{**

**Sytem.out.println(“ Visit Historical Places” );**

**}**

**} //end of class A**

**class B // class B acts as subclass of class A**

**{**

**publics static void main(String[] args)**

**{**

**A a1 = new A ( ) // no semi colon**

**{**

**publics void M1( )**

**{**

**// overriding**

**Sytem.out.println(“ travel by ship” );**

**}**

**} ; // semicolon**

**a1.M1(); // display: travel by ship**

**A a2 = new A();**

**a2.M1(); // display: travel by plane**

**} // end of main()**

**} // end of B**

1. **Why you get the above output?**

because they want to assign one to all the two classes. SO all two classes are printed out with m1 println.

1. **After compiling , how many classes (.class) files are generated? List their name.**

**3 files are generated. A.class, B$1.class, B.class**

**Q10: The partial code and the output of the code is given below.**

**class Outer**

{

**static class StaticInner**

**{**

**public void M1( )**

**{**

**System.out.println( “ running a method of Static inner class ”);**

**}**

**}**

**public static void main(String[] args)**

**{**

**// write your code**

**}**

}

**Otput: running a method of Static inner class**

Question: To get this output from the above code, write the missing code.

Answer: {

Outer.StaticInner O = **new** Outer.StaticInner();

O.M1();

}

**Q 11: The partial code and the output of the code is given below.**

**class Outer**

{

**static class StaticInner**

**{**

**publics void M1( )**

**{**

**Sytem.out.println( “running a method of Static inner class ”);**

**}**

**}**

}

class TestOuter

{

publics static void main(String[] args)

{

**// write your code**

}

}

Output: **running a method of Static inner class**

**Question : To get this output from the above code, write the missing code**

{

Outer.StaticInner i = **new** Outer.StaticInner();

i.M1();

}

Change the main class with a TestOuter in the Run configurations.

**Q12: After writing the following code, answer the questions that follows.**

**class Outer**

{

**static class StaticInner**

**{**

**publics static void main(String[] args)**

**{**

**Sytem.out.println( “ main method of Static inner class is running ” );**

**}**

**}**

**publics static void main(String[] args)**

**{**

**Sytem.out.println( “ main method of outer class is running );**

**}**

}

**a) After compiling , run the code by using the following command.**

**java outer**

**Question: what is the output ?**

Main method of outer class is running

**b) After compiling , run the code by using the following command.**

**java Outer$StaicInner**

**Question: what is the output ?**

Main method of Static inner class is running