JAVA Programming Language Homework X: Total Review

ID: Name:

1. Given the following Java code:

```
11.    public interface Status {
12.    /* insert code here */ int MY_VALUE = 10;
13.    }
```

Which three are valid on line 12? (Choose three)

A. final
B. static
C. native
D. public
E. private
F. abstract
G. protected

ANS: A B D

- 需知曉 interface 中屬性的基本特性：
  - public static final, 而且必須完成初始化的給值

2. Given the following Java code:

```
1.     public class ItemTest {
2.        private final int id;
3.        public ItemTest( int id ) { this.id = id; }
4.        public void updateId( int newId ) { id = newId; }
5.
6.        public static void main(String[] args) {
7.           ItemTest fa = new ItemTest(42);
8.           fa.updateId(69);
9.           System.out.println(fa.id);
10.       }
11.    }
```

What is the result?

A. Compilation fails
B. An exception is thrown at runtime
C. The attribute id in the Item object remains unchanged
D. The attribute id in the Item object is modified to the new value
E. A new Item object is created with the preferred value in the id attribute

ANS: A

- **答案選項中有編譯失敗，就先檢查編譯的問題**
- **id 為 final 屬性，但卻在 updateId() 方法中更改其值，將會造成編譯失敗。**

3. A programmer needs to create a logging method that can accept an arbitrary number of arguments. For example, it may be called in these ways:

```
logIt("log message1");
logIt("log message2", "log message3");
logIt("log message4", "log message5", "log message6");
```

Which declaration satisfies this requirement?

A. public void logIt(String * msgs)
B. public void logIt(String [] msgs)
C. public void logIt(String... msgs)
D. public void logIt(String msg1, String msg2, String msg3)

ANS: C

- **從題目中可以看到參數可以不定個數，而且皆為字串型別。**
- **因此將會適用在不定個數參數的宣告方式。**

4. Given the following Java code:

```
1.  class Converter {
2.      public static void main ( String [ ] args ) {
3.          Integer i = args[0] ;
4.          int j = 12 ;
```

```
5.                Sysem.out.println ( “It is “ + (j= =i) + “ that j= = i . “ ) ;
6.            }
7.        }
```

What is the result when the programmer attempts to compile the code and run it with the command Java Converter 12 ?

A. It is true that j==i
B. It is false that j==i
C. An exception is thrown at runtime
D. Compilation fails because of an error in line 3

ANS: D

- args[0] 為字串物件，將 Integer = String，將會造成編譯失敗。

5. Given the following Java code:

```
1.        public class Test {
2.            static public void main( String[] args ) {
3.                for ( int x = 1; x < args.length; x++ ) {
4.                    System.out.print( args [ x ] + " " );
5.                }
6.            }
7.        }
```

If the command line invocation “java Test a b c”, what is the result?

A. a b
B. b c
C. a b c
D. Compilation fails
E. An exception is thrown at runtime

ANS: B

- **先檢查是否有語法上的錯誤。**

- 開始跑程式，傳入三個參數：
  - args[0] = "a"
  - args[1] = "b"
  - args[2] = "c"
- for 迴圈從 1 跑到 2（因為 args[] 大小 length 為 3，所以小於 3 只會跑到 2），因此印出 "b c"。

6. A unix user named Bob wants to replace his chess program with a new one, but he is not sure where the old one is installed. Bob is currently able to run a Java chess program starting from his home directly/home/bob using the command :

java – classpath /test:/home/bob/downloads/*.jar games.Chess

Bob's CLASSPATH is set(at login time) to :

/usr /lib:/home/bob/classes:/opt/java/lib:/opt/java/lib/*.jar

What is a possible location for the Chess.class file?

A. /test/Chess.class
B. /home/bob/Chess.class
C. /test/games/Chess.class
D. /usr/lib/games/Chess.class
E. /home/bob/games/Chess.class
F. Inside jarfile /opt/java/lib/Games.jar(With a correct manifest)
G. Inside harfile /home/bob/downlands/Games.jar(with a correct manifest)

ANS: C

- 題目中的執行方式已經指定 classpath 在 /test:/home/bob/downloads/*.jar
- 執行呼叫方式為 games.Chess => 可以非常明確的知道 games/Chess.class
- 只有 C, D, E 符合以上條件
- 其中 C 是落在 classpath 中所指定的 /test 路徑下, 所以 C 會被正常執行

7. Given the following Java code:

```
1.          enum Example { ONE, TWO, THREE }
```

What is the result?

A. The expressions (ONE ==ONE) and ONE.equals(ONE) are both guaranteed to be true.
B. The expressions (ONE < TWO) is guaranteed to be true and ONE.compareTo(TWO) is guaranteed to be less than one.
C. The Example value cannot be used in a raw java.util.HashMap.;instead, the programmer must use a java.util.EnumMap.
D. The Example value can be used in a java.util.SortedSet, but the set will NOT be sorted because enumerated Type do not implement java.lang.Comparable.

ANS: A

- A: 兩個都是 ONE，== 與 equals() 皆為 true。
- B: ONE.compareTo(TWO) 為 -1 。
- C: 這個 enum Example 是可以放進 HashMap 中使用沒有問題。
- D: 也可以放進 SortedSet。

8. foo and bar public references available to many other threads, foo refers to a Thread and bar is an Objcet. The thread foo is currently executing bar.wait(). Form another thread, what provides the way to ensure that foo will stop executing wait()? (Choose two)

A. foo.notify();
B. bar.notify();
C. foo.notifyAll();
D. Thread.notify();
E. bar.notifyAll();

ANS: B E

- 題目的狀況是 foo 因為 bar.wait() 而處在等候狀態，要如何才能確保其不再執行 wait()？
- 唯一的方式就是由別的執行緒物件，呼叫 bar.notify() 或是 bar.notifyAll() 兩個方法。

9. Given the following Java code:

```
1.      class MyThread extends Thread {
2.          public void run() {
3.              m1();
4.          }
5.          MyThread(String threadName){
6.              super(threadName);
7.          }
8.          public synchronzed void m1() {
9.              System.out.println(Thread.currentThread().getName());
10.         }
11.         public static void main(String[] args) {
12.             MyThread a = new MyThread( "A" );
13.             MyThread b = new MyThread( "B" );
14.             a.setPriority( Thread,MIN_PRIORITY);
15.             b.setPriority( Thread,MAX_PRIORITY);
16.             a.start();
17.             Thread.yield();
18.             b.start();
19.         }
20.     }
```

Which of the following statements regarding the following code is true?

A. Thread B will get more CPU time than Thread A
B. Thread will start running before Thread A
C. If line 17 is removed, Thread B will get more CPU time than Thread A
D. If line 17 is removed, Thread B will start running before Thread A
E. None of the above

ANS: E

- 是否得到較多的 CPU time，從程式中看不出來。
- 誰先執行的決定，也無法從程式碼中看出。
- 不過從優先權值的設定來看，理論上，Thread B 會比 Thread A 先執行完畢。
- 因此選擇以上皆非

10. Given the following Java code:

```
1.      public class Threads1 {
2.        int x = 0;
3.        public class Runner implements Runnable {
4.          public void run () {
5.            int current = 0;
6.            for (int i = 0; i < 4; i++) {
7.              current = x;
8.              System.out.print(current + ", ");
9.              x = current + 2;
10.           }
11.         }
12.       }
13.
14.       public static void main ( String[] args ) {
15.         new Threads1().go();
16.       }
17.
18.       public void go() {
19.         Runnable r1 =new Runner ();
20.         new Thread(r1).start ();
21.         new Thread(r1).start ();
22.       }
23.     }
```

Which two are possible results? (choose two)

A. 0,2,4,4,6,8,10,6,
B. 0,2,4,6,8,10,2,4,
C. 0,2,4,6,8,10,12,14
D. 0,0,2,2,4,4,6,6,8,8,10,10,12,12,14,14,
E. 0,2,4,6,8,10,12,14,0,2,4,6,8,10,12,14,

ANS: A C

- Thread 的執行狀況並不是固定不變的，因此題目只能選出可能的答案。
- 先從 15 開始出發來看，呼叫 go() 方法，建構出 r1 (Runnable)，再以 r1 建構出兩個 Thread 物件。
- 兩個 Thread 物件共同以 r1 物件建構，所以共用 r1.x 變數。

- 各自以 start() 啟動 Thread 生命週期.
  - i = 0
    1. x = 0; current = 0
    2. 印出 "0,"
    3. x = 0 + 2 = 2;
  - i = 1
    1. x = 2; current = 2;
    2. 印出 "2,"
    3. x = 2 + 2 = 4;
  - i = 2
    1. x = 4; current = 4;
    2. 印出 "4,"
    3. x = 4 + 2 = 6
  - i = 3
    1. x = 6; current = 6;
    2. 印出 "6,"
    3. x = 6 + 2 = 8
  - 脫離 for loop
  - 一個 Thread 物件印出 "0, 2, 4, 6, "
- 可能性:
  - 第二個 Thread 在第一個 Thread 做完之後開始
    - 0,2,4,6,8,10,12,14,
  - 在第一圈後插入
    - 0,0,2,4,6,2,4,6
  - 在第二圈後插入
    - 0,2,2,4,6,8,4,6
  - 在第三圈後插入
    - 0,2,4,4,6,8,10,6
  - 無論如何，如果是中間插入的情況，第二個的 x 是從第一個來的，第一圈印出來會與第一個 Thread 目前的 current 相同。