

PMA Re-exam August 2022 Answers

1.

- a) False
- b) False
- c) True
- d) False
- e) True
- f) False
- g) True
- h) False
- i) True
- j) True

[1 mark for each correct part]

2.

- a) JAVA ROCKS
- b) So that it can act as the entry point of the program and be run before any objects are instantiated.
- c) It would cause the program not to compile, because the package declaration has to be the first line in any class definition file.
- d) The args variable of the main method collects any provided command line arguments into an array of Strings.
- e) System.out.

[2 marks for each correct part]

3.

- a) i) Composition. ii) 64. iii) No. iv) No. v) No. [5 marks, one for each subpart]
- b) i) Any number including 0. ii) 12 or more. iii) Yes. iv) Yes. v) A collection of 12 or more Course objects. It doesn't specify the specific runtime type of this collection. [5 marks, one for each part]

4.

- a)
(2,6)
null

b)

```
com.titanmusic.pmareexamaugust2022.Point@13221655  
null
```

(The hash code may be different.)

c) An error would occur and the program would not compile because there is no no-args constructor defined.

d) The program will compile, but it will crash at runtime because q has been set to null in line 24 and therefore cannot have any methods called on it at runtime.

e) The program would not compile because there can only be one public class definition in any single .java file.

[2 marks for each correct part]

5.

a) z is declared as final, so it cannot be changed in line 12. Line 12 would have to be commented out. [4 marks]

b)

```
6 7 3  
6 12 3  
6 17 3 [3 marks]
```

c)

```
6 7 3  
6 7 3  
6 7 3 [3 marks]
```

6.

[(0,2), (0,1), (0,0), (1,2), (1,1), (1,0), (2,2), (2,1), (2,0)]

[10 marks, 1 mark for each item in the correct relative order, + 1 for getting all right]

7.

a) Because it is referred to from within the static class CountRunnable. It therefore needs to exist even if there is no instance of the Question13 class. [2 marks]

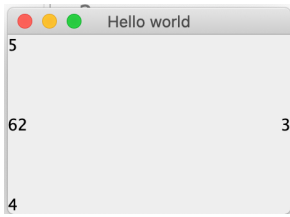
b) 4 [2 marks]

c) Because the relative order of executions of line 13 in different threads is random. For example, the first execution of line 13 for $i = 0$ in line 20 may occur before or after the first execution of line 13 for $i = 1$ in line 20. This is because it is the operating system that decides on how processor resources are allocated to threads. [3 marks]

d) B, C and D are possible outputs. (In A, 7 and 6 are the wrong way round.) [3 marks]

8. a) Initial thread or main thread, which is the thread in which the main method is called; the event dispatch thread, which is where all the Swing framework code executes; and

worker threads for running time-consuming tasks that would cause the GUI to block if they were run on the EDT. [6 marks]



b) [4 marks]

9.

a) Writes 1 the first time, then 2, 3, 1, 2 on the subsequent runs. [5 marks]

b) UDP [1 mark]

c) UDP is faster than TCP because it does not do error-checking. It is used in applications where time is of the essence and accuracy is not so important, such as ping, video streaming, time servers. [2 marks]

d) TCP is a reliable protocol that does error-checking, whereas UDP does no error-checking. TCP is used where it is important that the data arrives intact, such as FTP and HTTP. [2 marks]

10.

a) Activity, Service, Content Provider, Broadcast Receiver [2 marks]

b) There are explicit Intents and implicit Intents. An explicit Intent requests a component of a specific run-time class. An implicit Intent requests an Intent that can carry out a particular type of task (e.g., compose an Email or capture an image). [4 marks]

c) onPause() [2 marks]

d) onResume() [2 marks]