



Spring 2020

Course Code: CSE 231

Time allowed: 3:00 Hrs.

Advanced Computer Programming – Final Exam

The Exam Consists of Three Questions in THREE Pages.

Maximum Marks: 40 Marks

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Important Rules:

- Having a "turned ON" mobiles inside the examination hall is forbidden and is considered as a cheating behaviour. If you should have your mobile with you, it must be turned off and placed into your own bag.
- Any kind of "Smart Watches" or earphones (Bluetooth, wireless, or wired) are forbidden.
- It is forbidden to have any references, notes, books, or any other materials even if it is not related to the exam content with you in the examination hall.

تعليمات هامة

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Question (1): (5 points)

Choose the correct answer (**Only one. No credit otherwise**)

- a) An aggregation relationship is usually represented as _____ in _____.
- | | |
|---------------------------------------|--------------------------------------|
| A) a data field/the aggregating class | B) a data field/the aggregated class |
| C) a method/the aggregating class | D) a method/the aggregated class |
- b) A JavaFX action event handler contains a method _____.
- | | |
|---|---|
| A) public void actionPerformed(ActionEvent e) | B) public void actionPerformed(Event e) |
| C) public void handle(ActionEvent e) | D) public void handle(Event e) |
- c) What exception type does the following program throw?
- ```
public class Test {
 public static void main(String[] args) {
 int[] list = new int[5];
 System.out.println(list[5]);
 }
}
```
- |                                    |                                   |
|------------------------------------|-----------------------------------|
| A) ArithmeticException             | B) ArrayIndexOutOfBoundsException |
| B) StringIndexOutOfBoundsException | D) No exception                   |
- d) Suppose `List<String> list = new ArrayList<String>`. Which of the following operations are correct?
- |                                                 |                                             |
|-------------------------------------------------|---------------------------------------------|
| A) <code>list.add("Red");</code>                | B) <code>list.add(new Integer(100));</code> |
| C) <code>list.add(new java.util.Date());</code> | D) <code>list.add(new ArrayList());</code>  |
- e) You can use the \_\_\_\_\_ method to force one thread to wait for another thread to finish.
- |                                          |                         |
|------------------------------------------|-------------------------|
| A) <code>sleep(long milliseconds)</code> | B) <code>yield()</code> |
| C) <code>suspend()</code>                | D) <code>join()</code>  |

**Question (2): (23 points)**

- a) Consider the following code fragment:

```
public class Car {
```

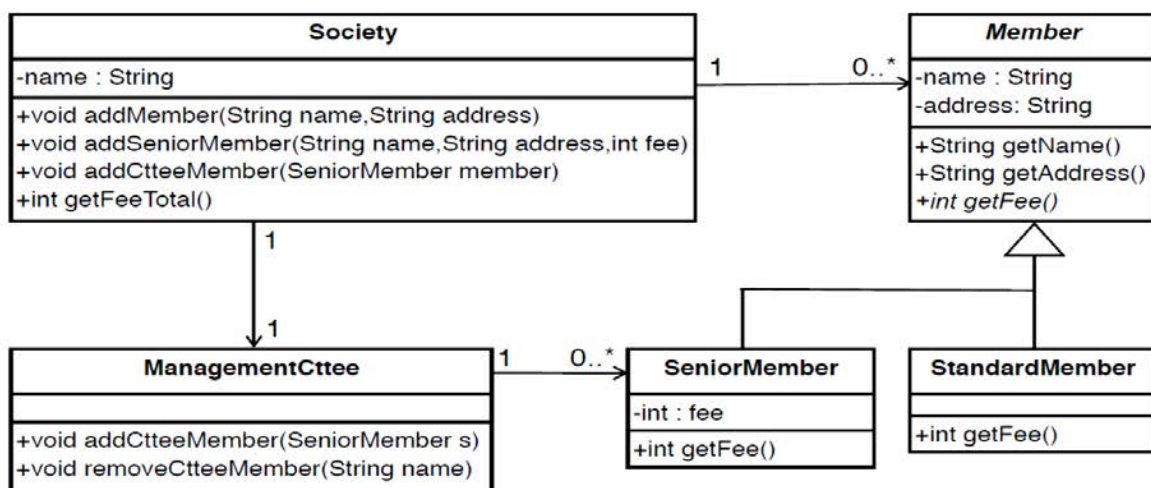
```
private final Engine engine;
public Car () {
 engine = new Engine();
}
}
class Engine {}
////////////////////////////////////
public class Team {
 private List players;

 public Team () {
 players = new ArrayList();
 }
}
class Player {}
```

- i. What is the relationship between class Car and class Engine? (2 points)
- ii. What is the relationship between class Team and class Player? (2 points)
- ii Draw the UML class diagram for the given code. (4 points)

- b) Consider this UML class diagram showing part of a program to manage the membership information for a professional society:

- i. Write a Java version of class ManagementCttee assuming it has this constructor: (6 points)  
`public ManagementCttee()`
- ii. Class Member is an abstract class. Explain the role of an abstract class. (3 points)
- iii. Write a Java version of class StandardMember assuming it has this constructor: (6 points)  
`public StandardMember(String name, String address)`  
 and the standard membership fee is fixed at L.E. 50.



**Question (3): (12 points)**

- a) In the following code segment, print method is a generic method. Write two different suitable method headers for method print that can be written in line 8. (4 points)

```
1. public class GenericMethodDemo {
2. public static void main(String[] args) {
3. Integer[] integers = {1, 2, 3, 4, 5};
4. String[] strings = {"London", "Paris", "New
York", "Austin"};
5. print(integers);
6. print(strings);
7. }
8. _____ {
9. for (int i = 0; i < list.length; i++)
10. System.out.print(list[i] + " ");
11. System.out.println();
12. }
```

b) What does the following statement do? Why do we need Thread pools? (4 points)

```
ExecutorService executor = Executors.newCachedThreadPool();
```

c) What is the difference between concurrent programming and procedural programming? (4 points)

END of Exam, Good Luck

Examination Committee

Dr. Maryam Al-Berry

Exam. Date :