



# **DESIGNING AND DEVELOPING OBJECT-ORIENTED COMPUTER PROGRAMS**

**9<sup>TH</sup> SEPTEMBER 2012**

## **Examination Paper**

**Answer ALL questions.**

**Clearly cross out surplus answers.**

**Time: 2 hours**

**Any reference material brought into the examination room must be handed to the invigilator before the start of the examination.**

**CANDIDATES MUST ATTEMPT ALL QUESTIONS**

**QUESTION 1**

**Marks**

- a) Explain what is meant by an 'IDE' and what the benefits are of using one. **4**
- b) Provide an overview of the code needed to create a button in a Java application and have it change the contents of a textbox when clicked. Provide code examples to support your answer. **6**

**Total 10 Marks**

**QUESTION 2**

- a) Explain what is meant by the term 'Virtual Machine' and how its use differs from platform-dependent interpretation and compilation. **6**
- b) Explain what is meant by the term 'instantiation', and what it implies about the relationship between an object and a class. **4**

**Total 10 Marks**

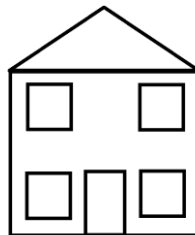
**QUESTION 3**

- a) Give an example, using code where appropriate, of a sensible constructor method for a Student class that contains attributes for name, address and age. **5**
- b) Re-use is an important element in software development. Discuss the feature(s) of Java that enhance the reusability of classes and objects. **5**

**Total 10 Marks**

**QUESTION 4**

- a) Explain what is meant by 'casting' in Java, and give an example. **2**
- b) Assuming usage of the graphics class, provide code samples of how you could draw a standard two dimensional house of the type shown below: **8**



**Total 10 Marks**

**QUESTION 5**

- a) Describe Java's event handling model, and what steps must be taken in a Java class to set up an event listener. **4**
- b) Explain the role of a Panel in setting up a user interface in Java. **2**
- c) Explain how the setBounds method is used, and discuss the drawbacks of using this method to layout an interface. **4**

**Total 10 Marks**

**QUESTIONS CONTINUE ON NEXT PAGE**

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**QUESTION 6****Marks**

- a) Explain what is meant by a 'class diagram', and provide an example. 4
- b) State the stages involved in the Unified Software Development Model, and give TWO (2) reasons why this model might be useful. 6

**Total 10 Marks****QUESTION 7**

- a) Explain what is meant by an 'exception', and give an example of behaviour in Java that would throw one. 4
- b) Provide an outline of the code required to deal with an `ArrayIndexOutOfBoundsException`. 4
- c) Explain what is meant by 'data validation' 2

**Total 10 Marks****QUESTION 8**

- a) Explain what is meant by the term 'encapsulation' 2
- b) Explain what is meant by the term 'accessor method', and provide a code example of accessor methods in use. 4
- c) Describe what is meant by 'public' and 'private' visibility, and give an example of when each would be appropriate. 4

**Total 10 Marks****QUESTION 9**

- a) Explain the difference between an array and an `ArrayList`, giving an example of when each might be preferred over the other. 4
- b) Explain the benefits of using a `LinkedList` over an `ArrayList` and give an example of when you would use a `LinkedList` in preference to an `ArrayList`. 3
- c) Explain the benefits of using an `ArrayList` over a `LinkedList`, and give an example of when you would use an `ArrayList` in preference to a `LinkedList`. 3

**Total 10 Marks****QUESTION 10**

- a) Explain the difference between a checked and unchecked exception, and give an example of a situation in which you might encounter each of these. 4
- b) Outline the steps required in order to read in text from a file on disk. 6

**Total 10 Marks****END OF PAPER**