



SOUTH EASTERN KENYA UNIVERSITY
UNIVERSITY EXAMINATIONS 2023/2024

**SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF
INFORMATION TECHNOLOGY**

BIT 211: Advanced object oriented programming

DATE: 8TH APRIL, 2024

TIME: 1.30-3.30 PM

INSTRUCTIONS TO CANDIDATES

- a) Answer **ALL** questions from section A(Compulsory)
- b) Answer **ANY TWO** questions from Section B

SECTION A - Compulsory

Question ONE

- (a) Describe TWO types of constructors as used in java programming. **[4 Marks]**
- (b) Using a in java code snippet, describe the following Wrapper class concepts:
 - (I) Autoboxing. **[3 Marks]**
 - (II) Unboxing. **[3 Marks]**
- (c) With the aid of a program code illustrate how an ArithmeticException:/ divide by zero could be handled by a programmer. **[5 Marks]**
- (d) Enumerate the steps required in using JDBC drive to connect to a database. **[5 Marks]**
- (e) Outline ONE difference between an Exception and an Error in java. **[2 Marks]**
- (f) Using a code snippet, illustrate inner and outer classes in java. **[4 Marks]**
- (g) State TWO differences between an Interface and Abstract class. **[4 Marks]**

SECTION B: Attempt TWO Questions

Question TWO

- (a) Explain the difference between checked and unchecked exceptions. [4 Marks]
- (b) Complete the generic class shown below by including a *constructor* and *getter* methods by adding constructor and getter methods. [8 Marks]

```
public class Pary<E, T> {  
    private E key;  
    private T value;  
    ____add constructor____  
    ____add getter methods____  
}
```

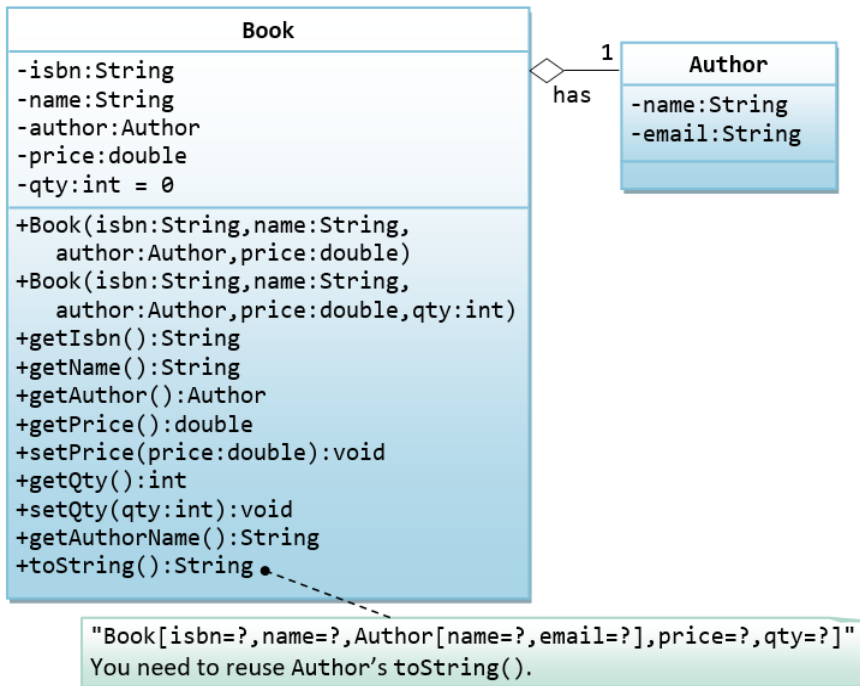
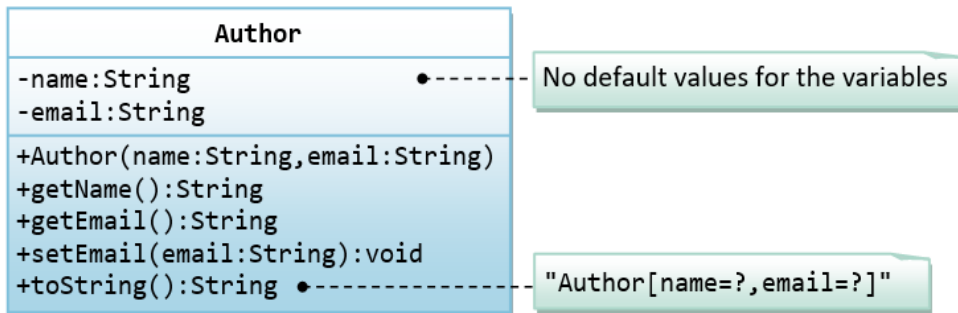
- (c) A software developer uses a *HashMap* data structure to store students' registration numbers and name. Using sample data below, write a java program that stores and displays student's details. [8 Marks]

| REG NO | NAME |
|--------|---------------|
| 100 | John Mumo |
| 101 | George Otieno |
| 102 | Jane Kariuki |
| 103 | Nancy Moraa |

Table 1: Sample Data

Question THREE

- (a) A class called **Author**, which models an author of a **book**, is designed as shown in the UML class diagram below. A class called **Book**, which models a book written by ONE author and composes an instance of Author as its instance variable, is also shown. Write the:
- i) Author class [7 Marks]
- ii) Book class. [9 Marks]



- iii) Using the given partial JavaFX code create a user interface (UI) of a password field shown below in fig 2 below. **[4 Marks]**

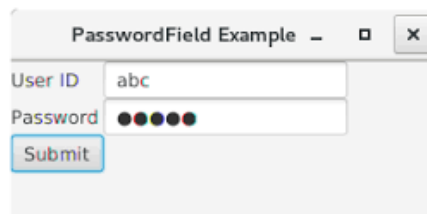
```
//^all import statements here"

public class PasswordFieldTest extends Application {
    public static void main(String[] args) {
        launch(args);
    }

    public void start(Stage primaryStage) throws Exception {
        .....
        .....
        .....

        primaryStage.setScene(scene);
        primaryStage.setTitle("PasswordField Example");
        primaryStage.show();
    } }

```



Question FOUR

- (a) Write a java program that inserts the values IDNO (integer), AccountName (String) and Branch(String) in a database table called Customer. **[10 Marks]**
- (b) The code snippets below represent two interfaces named Apple and Orange.

```
interface Learn{
    void learning();
}
```

```
interface Work{
    void working();
}
```

Create a class ***Student*** that implements both **Learn** and **Work** interfaces **[6 Marks]**

- (c) Explain FOUR differences between an abstract class and a concrete class. **[4 Marks]**