TECHNICAL UNIVERSITY OF MOMBASA

INSTITUTE OF COMPUTING AND INFORMATICS

UNIVERSITY EXAMINATION FOR:

BSCS/SEP2022/J-FT

CSE 4301 : OBJECT – ORIENTED APPLICATION DEVELOPMENT

SPECIAL/SUPPLEMENTARY EXAMINATION

PAPER II

SERIES: JULY 2025

TIME: 2 HOURS

DATE:

Instructions to Candidates

You should have the following for this examination

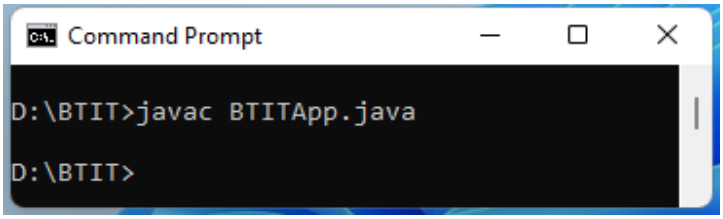
-Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other TWO questions.

Do not write on the question paper.

Question ONE

a.) The diagram below depicts a typical case of compiling a Java program, on the command prompt:



(i.) In your own perspective, did the Java source code compile?

(ii.) If it compiled, how can we further investigate that at the command prompt?

(iii.) What is the expected name of the Java bytecode in the above compilation?

(3 marks)

b.) In your own words, explain why do you think we cannot concurrently read and write on a flat file with a program that you have written?

(3 marks)

c.) Outline the elements that constitute a database URL for connecting to any database.

(3 marks)

d.) (i.) Define the term stream.

(ii.) Give the two stream objects required to read and write a typical serial access file in Java.

(4 marks)

e.) Briefly explain one reason why a database is better that flat file when it comes handling data?

(2 marks)

f.) Give the corresponding Java API for each of the following classes:

(i.) Scanner

(ii.) Container

(iii.) JFrame

(iv.) ActionEvent

(4 marks)

g.) Briefly describe two properties of Java makes it unique from C++ as a programming language.

(2 marks)

h.) i. Which are the two interpreters that offered in a typical JDK installation that may be used execute a typical Java bytecode file?

ii. Give the two types of applications that one may create using Java.

(4 marks)

i.) i. Give the general structure of the method header for the main method of an application class in Java.

ii. Briefly describe why the values of the first three elements of the main method header are the way are.

(5 marks)

Question TWO

a.) i. What are the fundamental classes that are required in a Java application to access in a database?

ii. As you outline, also give their respective method that is used in each to provide the access to a database.

iii. In which Java API are these classes you outlined in i. defined?

(9 marks)

b.) The following is an error message displayed when we invoke the compiler, javac with a source code file

```
D:\EXAMS>javac DBConnect.java
DBConnect.java:11: error: unreported exception SQLException; must be caught or declared to be thrown
                dbConnect = DriverManager.getConnection(dbURL);
                                                        ^
1 error

D:\EXAMS>
```

i. Which exception class raised the error above?
ii. Which method in the DriverManager class raised the exception?
iii. How can the exception raised above be handled?
iv. What does the printStackTrace() method help in handling this exception?

(5 marks)

c.) i. Outline the jars required to have Java application access a Microsoft Access database.
ii. Which environment variable needs to be specified for the required jars you outlined in i. and why?

(7 marks)

Question THREE

a.) Outline the steps that can be used in a Java application to access a database. (6 marks)

b.) Assume you have an access database called Student.accdb in your current application directory path E:\Register with the following Student table:

Field name	**Type**
RegNo	Text
StudentName	Text
Programme	Text
Fee	Float

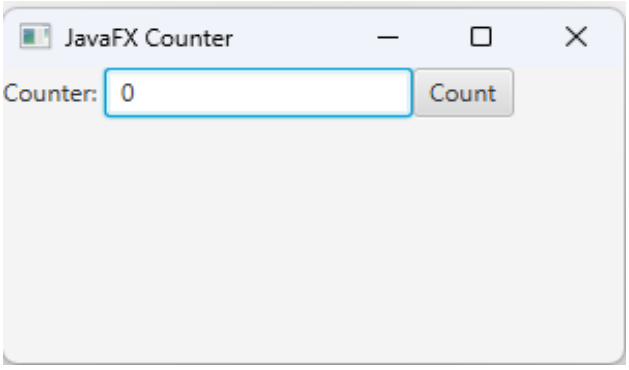
Write an application class that will select all database rows in the Student table and display them in the following format:

```
====  ============  ============  ====================  ============
SNo.  Reg. No.      Student Name  Programme             Fee
====  ============  ============  ====================  ============
1     BTIT/023J/2014  James Bradley   B.Tech ICT        61300.50
2     BSIT/0012/2017  Kenneth N. Mwasi  B.Sc in IT      52300.80
3     BTAP/001J/2015  Njoroge Kinyua   B.Sc in App Sci.  32000.60
……
```

(14 marks)

Question FOUR

The following figure presents a JavaFX GUI application:



Write a JavaFX application class to implement the same; with the following specification:

(i.) The TextField should increment its value by 1 as the user clicks the button labelled Count.

(ii.) All the three controls should use a FlowPane layout object.

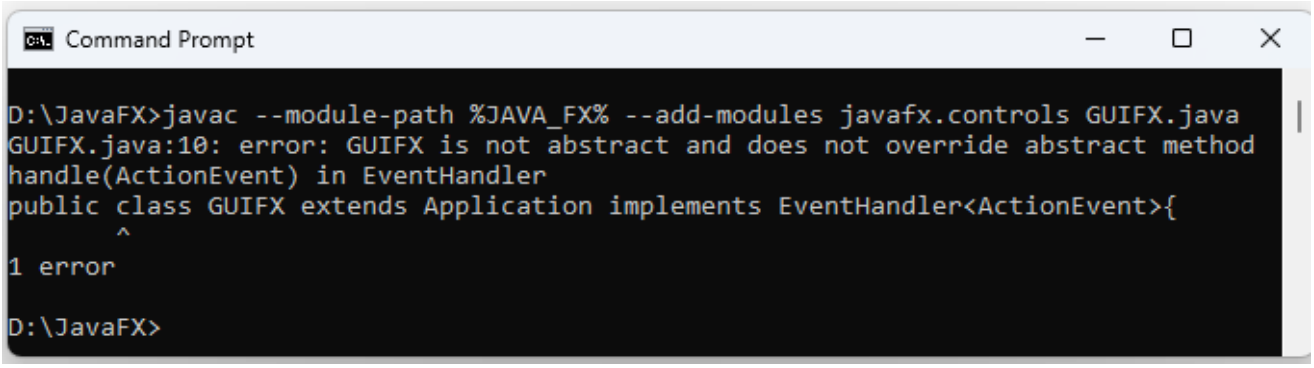
(20 marks)

Question FIVE

a.) (i.) What we are the three steps that can be used to handle events in JavaFX desktop application? (3 marks)

(ii.) How many Java APIs do we need when creating a simple complete JavaFX desktop application? (2 marks)

b.) The following is an error message displayed when we invoke the compiler, javac:



(i.) What do you think happened in the class definition for it to generate this error message?

(ii.) Which statement in the source code generated this error?

(iii.) What is the error called?

(iv.) How do we resolve this error?

(6 marks)

c.) Briefly describe the three life cycle methods for JavaFX application.

(3 marks)

d.) How does the launch() method work in a JavaFX application?

(4 marks)

e.) Distinguish between an application class and problem domain class.

(2 marks)