UGANDA BUSINESS AND TECHNICAL EXAMINATIONS BOARD

PAPER CODE	PROGRAMME	DATE
TDIT 214	NATIONAL DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY YEAR II SEMESTER I	TUESDAY, 06TH DECEMBER 2022
SERIES	**PAPER NAME**	**TIME ALLOWED**
NOV/DEC 2022	OBJECT-ORIENTED PROGRAMMING WITH JAVA	4 HOURS

YOU SHOULD HAVE THE FOLLOWING FOR THIS EXAMINATION

A computer installed with JDK, IDE and Net Beans or Eclipse software

A compact disk (CD)

Non-programmable calculator

Printer

INSTRUCTIONS TO CANDIDATES

1. *This paper consists of **six** practical questions.*
2. *Answer only **four** questions.*
3. *Create a folder on the desktop to save all your work.*
4. *All work must be transferred to a compact disc (CD) at the end of the examination.*
5. *Printout all program codes and output of all answers to questions attempted.*
6. ***Do not** write on the question paper.*
7. *Non–programmable electronic calculators may be used.*
8. *Read other instructions on the answer booklet.*

Question One

A year is a leap year if it is divisible by 4 but not by 100 or if it is divisible by 400 based on the Boolean expressions below.

```
boolean isLeapYear = (year % 4 == 0); or isLeapYear = isLeapYear &&
(year % 100 != 0); or isLeapYear = isLeapYear || (year % 400 == 0);
```

Required:

(a) Using Java IDE, create a project named "year". (03 marks)

(b) Create a Java class called "leapyear". (03 marks)

(c) Declare the variable in a program. (02 marks)

(d) Write a Java program to check whether a year is a leap year. (14 marks)

(e) Save all your codes in the folder you created on the desktop. (02 marks)

(f) Print out all your program codes and output. (01 mark)

Question Two

Students at a certain college were asked to rate on a scale of 1 to 5 the quality of the food in the student cafeteria, with 1 being "awful" and 5 being "excellent." There were 20 students who responded as summarized below.

Rating	Frequency
1	3
2	4
3	8
4	3
5	2

Required:

(a) Using Java IDE, create a project called "student". (03 marks)

(b) Create a Java class called "studentpoll". (03 marks)

(c) Declare the variables and initialize the values to the variables. (02 marks)

(d) Put all the 20 responses in one integer array and determine the frequency of each rating as shown in the figure above. Catch exceptions in case of a wrong entry. (14 marks)

(e) Save all your codes in the folder you created on the desktop. (02 marks)

(f) Print out all your program codes and output. (01 mark)

Question Three

The figure below shows the multiplication table. Using nested loops, write a Java program to display the table as it appears below.

```
                Multiplication Table
        1   2   3   4   5   6   7   8   9
    ---------------------------------------
1   |   1   2   3   4   5   6   7   8   9
2   |   2   4   6   8  10  12  14  16  18
3   |   3   6   9  12  15  18  21  24  27
4   |   4   8  12  16  20  24  28  32  36
5   |   5  10  15  20  25  30  35  40  45
6   |   6  12  18  24  30  36  42  48  54
7   |   7  14  21  28  35  42  49  56  63
8   |   8  16  24  32  40  48  56  64  72
9   |   9  18  27  36  45  54  63  72  81
```

Required:

(a) Using Java IDE, develop an application called "multiplication". (03 marks)

(b) Create a Java class called "multiplication_table". (03 marks)

(c) Declare and initialize the variables in the above program. (02 marks)

(d) Write program statements to display the multiplication table above. (14 marks)

(e) Save all your codes in the folder you created on the desktop. (02 marks)

(f) Print out all your program codes and output. (01 mark)

Question Four

You have been asked by a mathematics student to develop a Java program for him to practice subtraction. The program randomly generates two single-digit integers, number1 and number2, with number1 > = number2 and displays to the student a question such as "What is 9 - 2?". After the student enters the answer, the program displays a message indicating whether it is correct.

Required:

(a) Using Java IDE, create a project called "calculator". (03 marks)

(b) Create a Java class called "subtraction". (02 marks)

(c) Generate two single-digit integers into number1 and number2. (03 marks)

(d) If number1 < number2, swap number1 with number2. (05 marks)

(e) Prompt the student to answer "*What is number1 – number2?*". (05 marks)

(f) Check the student's answer and display whether the answer is correct. (04 marks)

(g) Save all your work in the folder created on desktop. (02 marks)

(h) Print out all your program codes and output. (01 mark)

Question Five

The demand for students in institutions has finally forced Cornerstone Institute to structure their online courses for anyone in Africa and beyond to enroll for them. The following are the details per course as shown in the table below:

Course	CourseID	Tuition
Software Engineering	SE	900,000
Information Technology	IT	750,000
Computer Science	CS	800,000
Business Administration	BA	850,000

Required:

(a) Using Java IDE, create an application called "cornerstone". (03 marks)

(b) Create a Java class called "courses". (03 marks)

(c) Identify and declare the variables in a program. (02 marks)

(d) Develop a Java application that prompts the applicant to feed in the CourseID, and the details of the course are returned to the screen. When the wrong code is fed into the system, "Wrong CourseID details" should be returned. (14 marks)

(e) Save the project in the folder created on desktop. (02 marks)

(f) Print out all your program codes and output. (01 mark)

Question Six

A prime number is a number that is divisible by 1 and itself. As a computer programmer you have been asked by the head of the mathematics department to help him write a Java program that would print out the first 50 prime numbers.

Required:

(a) Using Java IDE, create an application named "number". (03 marks)

(b) Create a Java class named "primenumber". (03 marks)

(c) Declare the variables in a program. (02 marks)

(d) Write a Java program to print out the first 50 prime numbers. (14 marks)

(e) Save all your codes in the folder you created on the desktop. (02 marks)

(f) Print out all your program codes and output. (01 mark)

END