NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF ENGINEERING

DEPARTMENT OF ELECTRONIC ENGINEERING

Software Engineering Applications

TEE 3133

Special Examination Paper

August 2024

This examination paper consists of 6 pages

Time Allowed: 3 hours

Total Marks: 100

Special Requirements: None

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INSTRUCTIONS

1. Answer **ALL** questions in section A and **ANY THREE** questions in section B
2. Section carries a total of 40 marks and section B carries a total of 60 marks.
3. Each question in section B carries 20 marks each.

MARK ALLOCATION

QUESTION	MARKS
1	6
2	15
3	9
4	10
5	20
6	20
7	20
8	20
TOTAL	100

SECTION A

Answer <u>ALL</u> questions in this section.

Question 1

Explain the following types of errors in programming:

      a. Syntax error
      b. Logical error
      c. Runtime error   [6]

Question 2

    a. State and explain one mySQL string data type, giving an example.   [3]
    b. How is the Boolean data type represented in mySQL database?   [1]
    c. Explain the BLOB data type and give an example of where it can be applied.   [2]
    d. With the aid of an example, explain how the **ON DELETE CASCADE** keyword works.   [5]
    e. Demonstrate how you would view matching records from two related tables, Student and Student Course, where the related field in both tables is regNumber.   [4]

Question 3

    a. Given the following piece of code, calculate the value of sum: [2]

```
int sum = 0;

int i = 0;

while (i < 5)

{

        sum = sum + i;

        i++;

}

System.out.print(i);

System.out.print(" ");

System.out.print(sum);
```

b. What is the output from the following piece of code   [2]

```
String S = ""; String T = "";
int i = 4;
for (i = 1; i <= 3; i++);
      S = S + "!";
for (i = 1; i < 4; i++)
      T = T + "*";
System.out.print(S);
System.out.println(T);
```

c. Rewrite the following switch statement using the if decision construct. Assume the answer is declared as int.   [5]

```
switch (answer)
{
      case 0: System.out.print("0 entered"); break;
      case 1: System.out.print("1 entered"); break;
      case 3: System.out.print("3 entered"); break;
      case 5: System.out.print("5 entered"); break;
      default: System.out.print("Other value entered");
}
```

Question 4

Explain the following terms as used in Java programming.   [10]

a. Polymorphism
b. Method
c. Class
d. Interface
e. Inheritance

SECTION B

Answer **ANY THREE** questions in this section.

Question 5

A small transport services entrepreneur wishes to have an electronic database to keep track of her fleet. The information that she needs include driver details and vehicle information(registration number, purchase price,date vehicle acquired, engine number, fuel type, road fitness, etc). At any given time, the entrepreneur will need to check for vehicle allocation to drivers.

    a. Design the database.   [10]
    b. Write a MySQL script to create the database.   [2]
    c. Write MySQL script to create **ANY ONE** of the tables designed in (a) above.   [3]
    d. Demonstrate how you would add records to the table created in (c) above using MySQL script.   [2]
    a. The transport owner wants to view records of all vehicles that are no longer fit for the road. Write a script to extract this data from the relevant table(s).   [3]

Question 6

    a. Write a Java program that will allow a nurse to enter weights of 20 newborn babies. The program must also be able to calculate how many babies are above the weight of 3kg and how many are below the weight of 1.8kg.   [15]
    b. Write a Java program to accept two integers and return true if the either one is 27 or if their sum or difference is 27.   [5]

Question 7

    a. A palindrome is a word that reads the same from left to right, and from right to left, that is, in the reverse order. For example, the word *madam* is a palindrome. Write a Java program to check whether a given word is a palindrome or not. [10]
    b. The following piece of code has errors that must be corrected. You are required to identify the errors and rewrite the piece of code to correct the errors. In your code comment on where the error indicates what was the error in the original code. [10]

```
import java.util.Scanner:
public class HELLO
{
        private static void main(String[] args)
        {
                Scanner input = new Scanner(SYSTEM.in);
                System.out.println("Enter your name:");
                String name = input.nextLine();
                System.out.printf("Welcome %s to Java OOP course/n,n);
```

QUESTION 8

Write a program to demonstrate the declaration of the class, constructor and methods for the class described below. Also instantiate the class with 2 objects, a car and a motorbike. For each instantiation, call the method to get attribute values from the keyboard and output the result on the console:

Vehicle class is a blueprint for different vehicles. The following attributes must be recorded: the engine number, chassis number, model, make, engine capacity, and year. The program must also record the number of wheels for a motorbike. The values for the mentioned attributes are obtained from the user. [20]

END EXAMINATION PAPER