# The Open University of Sri Lanka
## Faculty of Engineering Technology
### Department of Electrical and Computer Engineering

| | | |
|---|---|---|
| Study Programme | : | Bachelor of Science Honours in Engineering |
| Name of the Examination | : | Final Examination |
| Course Code and Title | : | EEX3372, Programming in Python |
| Academic Year | : | 2024/25 |
| Date | : | 26th February 2026 |
| Time | : | 1330-1630h |
| Duration | : | 3 hours |

**General instructions**

1. Read all instructions carefully before answering the questions.
2. This question paper consists of **four(4)** questions on **4** pages.
3. Answer **all** questions.
4. The answer to each question should commence on a new page.
5. This is a Closed Book Test (CBT).

## Question 01 [40 marks]

(a) Write a Python code for the function **generate_values(m, n, k, limit)** **[15 marks]**

Content in the function is as shown in Figure Q1.1

```
# Use a for loop to calculate values of y for x = 1 to limit
# For each value of x, compute y using the formula:
                    y = mx^2 + nx + k
# append each calculated value to a list
# Return the list of calculated values
```

Figure Q1.1 function generate_values(m, n, k, limit)

(b) Write a Python code for a function named **count_vowels(char_list)**. The content of the function should follow the requirements shown in Figure Q1.2 **[15 marks]**

```
# Create a variable named 'count' and initialize it to 0.
# Accept an array (list) of characters named char_list as the function parameter.
# Use a for loop to process each character in the list.
# Use if-else conditions to check whether each character is a vowel (a, e, i, o, u).
# Count the total number of vowels and store the result in the variable count.
# Return the value of count.
```

Figure Q1.2: Content of the function **count_vowels(char_list)**

(c) Write Python code to execute the function and display the total number of vowels in the character list "The Open University of Sri Lanka" **[5 marks]**

(d) What is the output of the expression 5 - 5 * 5 / 0 in Python? **[5 marks]**

## Question 02 [20 marks]

(a) What will be the output of the Python code in Figure Q2.1? **[5 marks]**

```
text = "ComputerEngineering"
print(text[3:10:2])
```

Figure Q2.1

(b) What are the data types of the variables in Python in Figure Q2.2? **[5 marks]**

```
p = 10
q = 10 / 2
r = 10*2
s ="The"
```

Figure Q2.2

(c) Complete the table given in Table Q2 according to the output generated for each iteration for the code snippet given in Figure Q2.3. You may copy the Table Q2 into your answer sheet. **[5 marks]**

```
total = 0
for i in range(1, 6):
  if i % 2 == 0:
    total += i
  else:
    total -= i
  print(i, total)
```

Figure Q2.3

| i | condition | operation | total |
|---|---|---|---|
| 1 | odd | 0-1 | -1 |
| | | | |
| | | | |
| | | | |
| | | | |

Table Q2

(d) What is the output of the Python code in Figure Q2.4? **[5 marks]**

```
data = [1, 2, 3, 4, 5]
result = []
for x in data:
  if x % 2 == 0:
    result.append(x * 2)
  else:
    result.append(x)
print(result)
```

Figure Q2.4

## Question 03 [20 marks]

```
class Employee:
  def __init__(self, emp_id, name, salary=0):
    self.emp_id = emp_id
    self.name = name
    self.salary = salary

  def __str__(self):
    return f"Employee ID = {self.emp_id}, Name = {self.name}, Salary = {self.salary}"

  def work_hours(self, date, hours, overtime="no"):
    return f"Employee ID={self.emp_id}, Date={date}, Hours={hours}, Overtime={overtime}"

e1 = Employee("E001", "Nimal", 50000)
e2 = Employee("E002", "Sunil")
```

Figure Q3.1

Considering the Python code in Figure Q3.1, write the outputs of the statements in (a),(b), (c ), and (d).

(a) print(e1) **[5 marks]**

(b) print(e2) **[5 marks]**

(c) print(e2.work_hours("12-01-2026", 8, "yes")) **[5 marks]**

(d) e2.salary = 40000
print(e2) **[5 marks]**

## Question 04 [20 marks]

Consider the Python program in Figure Q4.1 that uses the **sqlite3** module to create and manipulate a database table.

```
1  import sqlite3
2  conn = sqlite3.connect('employee.db')
3  cur = conn.cursor()
4  cur.execute('''CREATE TABLE IF NOT EXISTS Employee(
5      emp_id INTEGER PRIMARY KEY,
6      name TEXT NOT NULL,
7      department TEXT NOT NULL,
8      salary INTEGER NOT NULL)''')
9  records = [(101, 'Nimal', 'IT', 50000), (101, 'Sunil', 'HR', 45000)]
10 cur.executemany('''INSERT INTO Employee (emp_id, name, department, salary)
11 VALUES (?, ?, ?, ?)''', records)
12 conn.commit()
13 cur.execute('SELECT * FROM Employee')
14 rows = cur.fetchall()
15 for row in rows:
16   print(row)
   conn.close()
```

Figure Q4.1

(a) What is the problem in line number **09**? **[5 marks]**

(b) Rewrite the command in line number 09 to change the emp_id of the second record to 105. **[5 marks]**

(c) What is the output of the above Python code if the database is empty initially?

**[5 marks]**

(d) Write the correct SQL command to select only the name and salary columns.

**[5 marks]**