NEAR EAST UNIVERSITY
FACULTY OF ENGINEERING
2024-25 SPRING SEMESTER
ECC102 – PROGRAMMING AND PROBLEM-SOLVING
MIDTERM EXAM

Name-Surname:	Std. No:
Department:	Signature:

- You have **100 minutes** to finish this exam.
- **WRITE CLEARLY.** We can't give you credit if we can't read and understand your answers!
- **Calculators, mobile phones, laptops, tablets, or other electronic devices are PROHIBITED.**
- A **single double-sided worksheet** including your **name and student number** is allowed.
- You have **THREE SECTIONS** in this exam.
- The first section includes determining the outputs of the given programs (**15 questions – 2 pts each – total of 30 pts.**).
- The second section includes finding and correcting the mistakes of the given programs (**2 questions – 10 pts each – total of 20 pts.**).
- The last section is the code writing section **(3 questions – total of 50 pts.)**.
- There are **8 pages** in the exam paper including this page.

SECTION A. Determine the outputs of the given programs.

1.

```
x = 10
y = 3
print(x // y + x % y)
```

Output: 4

2.

```
s = "Python"
print(s[1:5],"\n",s[-1])
```

Output: ytho
n

3.

```
def mystery(val):
    if val % 2 == 0:
        return val // 2
    else:
        return val * 3 + 1

print(mystery(7))
```

Output: 22

4.

```
x = 0
while x < 5:
    x += 2
print(x)
```

Output: 6

5.

```
def greet(name):
    return "Hello, " + name

print(greet())
```

Output: Error

6.

```
def add(a, b):
    return a + b
print(add(2, add(1, 3)))
```

Output: 6

7.

```
def append_to_list(value, my_list=[]):
    my_list.append(value)
    return my_list

m = append_to_list(1)
a = append_to_list(2)
print(m)
```

Output: [1 , 2]

8.

```
result = ""
for i in range(2):
    for j in range(i, 3):
        result += str(i + j)
print(result)
```

Output: 01223

9.

```
text = "abcdef"
print(text[::2] + text[:-2])
```

Output: aceabcd

10.

```
a, b, c = 1, 2, 3
a, b, c = c, a, b
print(a, b, c)
```

Output: 3 1 2

11.

```
names = ['Ali', 'Veli', 'Ayse']
for i, name in enumerate(names):
    if name == "Veli":
        index = i

print(f"The index of {names[index]} is {index}")
```

Output: The index of Veli is 1

12.

```
x = 10
def test():
    x = 5
test()
print(x)
```

Output: 10

13.

```
x = 4
if x > 2:
    if x < 6:
        print("Between 2 and 6")
    else:
        print("Greater than 6")
else:
    print("2 or less")
```

Output: Between 2 and 6

14.

```
x = 0
while True:
    x += 1
    if x == 3:
        break
print(x)
```

Output: 3

15.

```
value = True
if value:
    value = False
    if value:
        print("True1")
    else:
        print("False1")
else:
    print("False2")
```

Output: False1

END OF SECTION A.

SECTION B. Find and correct the mistakes.

Question 1. Based on the given assignment, the student wrote a Python program to read a series of characters from the keyboard until the user enters " " (space) and to determine:

1. Number of entered vowels
2. Number of entered "a" characters.

However, the student made five mistakes that caused the program to crash. The student program is given below. Find and correct the mistakes to obtain accurate results.

```
chars = {"a","e","i","o","u"}
while True:
    inp = input("Enter a character:")
    if inp == ' ':
        continue
    elif inp in chars:
        our_list.append(chars)

count = 1
for i in our_list:
    if i == "a":
        count+= 1
print("no. of entered vowels:", len(our_list))
print("no. of entered -a-s:", len(count))
```

Answer:

```
our_list = []
chars = {"a","e","i","o","u"}
while True:
    inp = input("Enter a character:")
    if inp == ' ':
        break
    elif inp in chars:
        our_list.append(inp)

count = 0
for i in our_list:
    if i == "a":
        count+= 1
print("no. of entered vowels:", len(our_list))
print("no. of entered -a-s:", count)
```

Question 2. One of our students aimed to display the courses of the first and second years using user-defined functions. The aim was to display the courses in function "one" if the student is a first-year student and display the courses in function "two" if he/she is a second or above-year student. The "student" function is used to call these functions, and the class value of the student is passed from the main program to this function. However, the student made two mistakes when using functions. The program is given below. Find and correct these two mistakes.

```
def one(st):
    print("ECC102")
    print("MTH101")
def two():
    print("ECC201")
    print("MTH201")

def student():
    if st == 1:
        one()
    else:
        two()

student(1)
```

Answer:

```
def one():
    print("ECC102")
    print("MTH101")
def two():
    print("ECC201")
    print("MTH201")

def student(st):
    if st == 1:
        one()
    else:
        two()

student(2)
```

SECTION C - Write the Python programs for the given problems.

Question 1. Write a Python program that asks the user to enter a username and then converts it into a legal format by doing the following:

Removes all spaces from the input.

Converts all characters to lowercase.

EXAMPLES:

Entered Username: ECC102 Output: ecc102

Entered Username: E C c 1 0 2 Output: ecc102

All of the operations should be performed in a user-defined function (formatter(u)) which will be called from the main program after reading the username (10 pts.).

Answer:

```
def format_username(raw_username):

    no_spaces = raw_username.replace(" ", "")
    lowercased = no_spaces.lower()
    return lowercased


user_input = input("Username: ")
formatted = format_username(user_input)

print("Formatted username:", formatted)
```

Question 2. Write a function named print_star_triangle() that asks the user for a number and prints a triangle of stars with that many rows.
Each row should contain an increasing number of stars, starting from 1 up to the number the user entered (20 pts.).

Example 1:

Enter the number of rows: 2
*
**

Example 2:

Enter the number of rows: 4
*
**
***
****

Answer:

```
def print_star_triangle():
    rows = int(input("Enter the number of rows: "))
    for i in range(1, rows + 1):
        print('*' * i)


print_star_triangle()
```

Question 3. Write a Python function named fizz_buzz() that prints the numbers from 1 to 50 using a while loop, following these rules:

For numbers that are multiples of 3, print "Fizz" instead of the number.

For numbers that are multiples of 5, print "Buzz" instead of the number.

For numbers that are multiples of both 3 and 5, print "FizzBuzz" instead of the number.

For all other numbers, print the number itself.

You must use a while loop (not a for loop). The function should start counting from 1 and stop at 50 (including both) (20 pts).

Answer:

```
def fizz_buzz():
    num = 1
    while num <= 50:
        if num % 3 == 0 and num % 5 == 0:
            print("FizzBuzz")
        elif num % 3 == 0:
            print("Fizz")
        elif num % 5 == 0:
            print("Buzz")
        else:
            print(num)
        num += 1

fizz_buzz()
```