الجامعة الوطنية
National University
Science & Technology للعلوم والتكنولوجيا
كلية عمان البحرية الدولية
International Maritime College Oman

Midterm Exam
PIT I.I: IT FOUNDATIONS I
Fall 2024

Points of attention:

- For each question, the maximum earned points are specified in the question.
- Write clearly! Answers that are not readable are not marked and don't earn marks!
- All answers should be written in English using **blue or black pens** only.
- Use the pencil only for diagrams and graphs.
- Show all the calculation steps in the given space.
- When finished, submit the question paper, together with the answer scripts and the signed cover page to the invigilator.
- Any cheating/copying may result in an instant failing of the examination.

Exam Duration: 1.5 hours
Instructor's Name: A. Alhabsi and A. Albalushi
Exam Date: 05/11/2024
Program: LTM

	30
	10

Student Information			
Name:		ID:	
Signature:			

Invigilator			
Initials:		☐ Student ID checked	
Time received:			

The exam consists of four questions. *Answer any three questions*.

Answer the questions using Jupyter Notebook. Include your name, section number and ID on a cell at the top of the programs. At the end, create a single PDF file with your programs and sample output. Submit the PDF file into Blackboard.

Question 1 **[10 marks]**

Write a Python program that asks the user for three inputs: *w*, *x*, and *y* (where *y* is an angle in degrees). If *w* is negative, then the program calculates $f = x^3 + \sin y$. If the input *w* is zero or positive, then the program calculates $f = 5x^2 + \cos\left(\frac{y}{2}\right)$. Finally, the program displays the value of *f*. Test your program for two sets of values as follows.

First, test it for:

w	x	y
-3	4	60

Then, test the same program for:

w	x	y
17	3	120

Question 2 **[10 marks]**

Write a Python program that that uses a loop to display the numbers 7, 8, 9, ..., 40, their double, their squares and their square roots. The results should be like:

```
7    14    49     2.64575
8    16    64     2.82842
9     ….
….
40    80   1600    6.32455
```

Question 3 **[10 marks]**

Write a program that accepts the user's input for the original price of a product. If the price is greater than $100, apply a 10% discount; otherwise, apply a 5% discount. Calculate the final price to be paid after the discount. Display the discount amount as well as the final price the user must pay. Ensure both the discount and the final price are rounded to two decimal places.

Question 4 **[10 marks]**

Write a program that asks the user for the radius of a circle. Then, the program calculates and displays the area of the circle. Use the formula Area= πr^2 and round the result to two decimal places.

No questions beyond this point.

The following are commonly used statements you may or may not find useful in your exam.

```
import math
```

Common Math functions:

```
math.sin()              math.log()
math.cos()              math.log10()
math.tan()              math.exp()
math.sqrt()             math.pi
math.sqrt()             math.radians()
```

MLO and Bloom's Level of Complexity

Q #	MLO Addressed	Complexity Level	Mark	Remark
1	**5**	Create, analyze	**10**	3 of 4 problems are required
2	**5**	Create, analyze	**10**	
3	**5**	Create, analyze	**10**	
4	**5**	Create, analyze	**10**	