Manisa Celal Bayar University – Department of Computer Engineering
CSE 3239 Numerical Analysis for Computer Engineers – Midterm Exam

Name and Surname	
Student Id	
Signature	

Question	1	2	3	4	Total
Score					

		Learning Objectives				
		L1	L2	L3	L4	L5
Questions	Q1	✓				
	Q2			✓		
	Q3		✓			
	Q4			✓		

Questions

Q1 (25 Points) Convert your student id to hexadecimal numbering system.

Q2 (25 Points) Find the bias for a 7-bit exponent in IEEE 754 representation of floating point numbers.

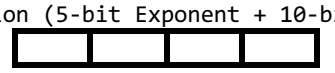
Q3 (25 Points) Write a Python function which converts a base-10 floating point number into any base including the decimal part.

```
import string
# full_set is a global variable which returns:
# 0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZ
full_set = string.digits + string.ascii_uppercase

def to_any_base(number: float, base: int) -> str:
    # Examples:
    # to_any_base(13.375, 2) -> '1101.011'
    # to_any_base(13.375, 4) -> '31.12'
    # to_any_base(13.375, 8) -> '15.3'
    # to_any_base(13.375, 16) -> 'D.6'
```

Q4 (25 Points) Find the IEEE 754 representation in the given precisions of the floating point number 22.11 and fill the tables given below with hexadecimal digits.

Half Precision (5-bit Exponent + 10-bit Mantissa)



Single Precision (8-bit Exponent + 23-bit Mantissa)

You have 90 minutes, gl hf.
Assoc. Prof. Dr. Bora Canbula