**Department of Computer Science**

National University of Computer and Emerging Sciences

Lahore Campus

**Digital Logic Design**

**EE1005- Section 2A,2B,2N**

**Assignment 1**

**Due Date March 13, 2022 before 11.59 pm**

**Total Marks: 80**

**Submit handwritten PDF document in Google Classroom as well as hardcopy in class.**

**Question 1 [6 marks]**

What is the exact number of bits in a memory that contains?

(a) 128K bits

(b) 32M bits

(c) 8G bits

**Question 2 [2 Marks]**

What are these equivalent to?

1. 64 K bits = (?) M bits
2. 9 G bits = (?) M bits

**Question 3 [20 marks]**

Convert the following numbers from the given base to the rest of all other bases (Decimal, Binary, Octal, Hexa-decimal.

1. (369.3125)10
2. (10111101.101)2
3. (326.5)8
4. (F3C7.A)16

**Question 4 [8 marks]**

Convert the following decimal numbers to the indicated bases, using the methods of

1. 7562.45 to octal
2. 1938.257 to hexadecimal
3. 175.175 to binary
4. 25.305 to base 8

**Question 5 [2 marks]**

In each of the following cases, determine the radix r:

(a) (BEE) r = (2699)10

(b) (365) r = (194)10

**Question 6 [2+3 marks]**

1. What bit position in an ASCII code must be complemented to change the ASCII letter represented from uppercase to lowercase and vice versa? Give example.
2. Decode following ASCII code message

1001000 1100101 1101100 1101100 1101111 0101110

**Question 7 [10 marks]**

For the following numbers, the leftmost bit of an 8-bit number represents a parity bit. State the value of the 8-bit number in hexadecimal if the following numbers are to be stored by using odd parity:

|  |  |  |  |
| --- | --- | --- | --- |
| **Decimal Number** | **7-bit binary equivalent** | **8-bit number including parity bit** | **Hexadecimal equivalent of the previous column** |
| 6 |  |  |  |
| 15 |  |  |  |
| 24 |  |  |  |

**Question 8 [8 marks]**

Show the bit configuration that represents the decimal number 255 in:  
**(a)** Binary

**(b)** BCD

**(c)** ASCII

**(d)** ASCII with odd parity

**Question 9 [9 marks]**

Convert each pair of decimal numbers to binary and add using the 2’s complement form:

1. 56 and 227
2. 246 and 25
3. 2110 and 284

**Question 10 [5 marks]**

Perform each operation in the 2’s complement form:

1. 01110000 + 10101111
2. 11011001 + 11100111
3. 01100101 – 11101000

**Question 11** Simplify the given expression using Boolean laws/Identities.

Note: Mention the laws/identities you use in steps of your simplification. **[5 marks]**

