B.Tech. (Computer Science and Engineering)
Semester-IV
Subject: Computer Organization and Design (BCO 009B)
Marks: 64
Instructions:

- **Answer all questions.**
- **All questions carry equal marks.**
- **Write answers neatly and clearly.**
- **Marks will be awarded for both correctness and clarity of explanation.**

Assignment #1

Section A Answer the following Questions: (5*2=10 marks)

Q.1 [CO1] Convert the decimal number 92.35 to binary, octal, and hexadecimal representations.
Q.2[CO1] Define the term "bus" in the context of computer architecture and explain its types
Q.3[CO1] Perform the subtraction 100 - 110000 by taking 2's complement of the subtrahend.
Q.4[CO1] Find R' compliment of

1. $(11011)_2$
2. $(BAC)_{16}$

Q.5[CO1] What is the purpose of a memory hierarchy in computer architecture? Briefly explain.

Section B Answer the following Questions: (7x3=21Marks)

Q.1 [CO1] Explain how to perform division using binary numbers. Provide an example.
Q.2[CO1] Compare and contrast Harvard architecture and Von Neumann architecture.
Q.3[CO1] Explain the working of XNOR gate with truth table and symbol.

Section C Answer the following Questions: (11x3=33Marks)

Q.1 [CO1] Explain the Basic Organization of a Computer System with a neat diagram**.**
Q.2[CO1] What is the number system? Define all types and convert the following:

i) $(1101101)_2 = (?)_{16}$
ii) $(256.51)_8 = (?)_{10}$
iii) $(AE10)_{16} = (?)_2$
iv) $(39)_4 = (?)_6$

Q.3[CO1] Explain the different types of logic gates (AND, OR, NOT, NAND, NOR, XOR, XNOR) with their symbols, truth tables, and Boolean expressions. Also, prove that NAND and NOR are universal gates by constructing AND, OR, and NOT gates using them.

Last Date of Submission: 1/09/2025