



COMSATS University Islamabad

Islamabad Campus
Computer Science Department
Midterm Exam

Class: BCS-2B

Subject: EEE-241/Digital Logic Design

Instructor: Fahad Sharief

Date: Nov 08, 2023

Time Allowed: 80 minutes

Marks: 25

Instructions: -Attempt all questions

Q No.1)

(2+2=4 marks)

- Convert the decimal number $(229.47)_{10}$ into binary and hexadecimal number systems.
- Perform the following subtraction by taking 2's complement method.

$$101100 - 110110$$

Q No.2)

(6+4=10 marks)

- Reduce the following Boolean expressions to the minimum number of literals:

a) $\overline{(\overline{x} + z)} (\overline{y} y) (\overline{x} \overline{y}) (\overline{x} + y)$

b) $\overline{A} B (\overline{D} + \overline{C} D) + B (A + \overline{A} C D)$

- Simplify the following Boolean function F using K-map, together with the don't-care conditions d.

$$F(A, B, C, D) = \sum (2, 4, 6, 10, 12)$$

$$d(A, B, C, D) = \sum (0, 8, 9, 13)$$

Q No.3)

(7+4=11 marks)

- Design a combinational circuit with three inputs, x, y, and z, and three outputs, A, B, and C.
 - When the binary input is 0, 1, 2, or 3, the binary output is three greater than the input.
 - When the binary input is 4, 5, 6, or 7, the binary output is one less than the input.
- Design a full adder circuit.

***** GOOD LUCK *****