AL-Mustaqbal University
College of Engineering and Technology
Communication Technical Eng. Dep.
Mid Exam 2024-2025 2^{nd} Semester
Class: First Year

Subject: Digital Logic
Module Code: UOMU028021
Time Allowed: 1 Hour
Date: 30/04/2025
Total Marks: 10

Important Note

Attempt All Questions.

Q1. Convert the Decimal number $\mathbf{214_{10}}$ to Hexadecimal. Then, convert the resulting Hexadecimal number to Binary?

Q2. Solve for **x** in the equation: $\mathbf{34.562_8 = x_2}$?

Q3. Convert the Binary number $\mathbf{101.1011_2}$ to Decimal number?

Q4. **Multiple-Choice and Explanation**

(a) Choose the correct answers for the following multiple-choice questions:

1. In the Hexadecimal number system (base-16), the digits used are:
   A. 0-1. **B. 0-7**. **C. 0-9**. **D. 0-15**.
2. When counting in the binary system (base-2), what is the number that comes immediately after $\mathbf{11001_2}$?
   A. $\mathbf{11010_2}$ **B.** $\mathbf{11011_2}$ **C.** $\mathbf{11100_2}$ **D.** $\mathbf{11101_2}$
3. What does the value of a number in any base system represent?
   A. The product of its digits **B.** The largest digit in the number **C.** The count of its digits **D.** The sum of each digit multiplied by its positional weight
4. What is the largest decimal number that can be represented using 5 bits in binary?
   A. 15. **B. 31**. **C. 63**. **D. 127**.

(b) Subtract **9 - 5** using **2's** complement using 4 binary digits?

Good Luck

Examiner: Dr. Mohammed Fadhil **Head of Dept.: Prof. Dr. Haider Jabbar Abd**

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Attempt All Questions.

Q1. Convert the Decimal number $\mathbf{3117_{10}}$ to Hexadecimal. Then, convert the resulting Hexadecimal number to Binary?

Q2. Solve for **x** in the equation: $\mathbf{174.3_8 = x_{10}}$?

Q3. Convert the Decimal number $\mathbf{45.625_{10}}$ to Binary number?

Q4. **Multiple-Choice and Explanation**

(a) Choose the correct answers for the following multiple-choice questions:

1. In the decimal number system (base-10), the digits used are:
   A. 0-7. **B. 0-9**. **C. 0-15**. **D. 0-1**.
2. When counting in the binary system (base-2), what is the number that comes immediately after $\mathbf{111_2}$?
   A. $\mathbf{1000_2}$ **B.** $\mathbf{0000_2}$ **C.** $\mathbf{1110_2}$ **D.** $\mathbf{1001_2}$
3. What does the value of a number in any base system represent?
   A. The product of its digits **B.** The largest digit in the number **C.** The count of its digits **D.** The sum of each digit multiplied by its positional weight
4. What is the largest decimal number that can be represented using 8 bits in binary?
   A. 128. **B. 127**. **C. 255**. **D. 256**.

(b) Subtract **7 - 4** using **1's** complement and **2's** complement and explain the key differences.

Good Luck

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Important Note

Attempt All Questions.

Q1. Convert the Decimal number $\mathbf{423_{10}}$ to Hexadecimal. Then, convert the resulting Hexadecimal number to Binary?

Q2. Solve for **x** in the equation: $\mathbf{372.3_8 = x_{10}}$?

Q3. Convert the Decimal number $\mathbf{33.625_{10}}$ to Binary number?

Q4. **Multiple-Choice and Explanation**

(a) Choose the correct answers for the following multiple-choice questions:

1. In the octal number system (base-8), the digits used are:
   A. **0-1**. **B.** **0-7**. **C.** **0-9**. **D.** **0-15**.
2. When counting in the binary system (base-2), what is the number that comes immediately after $\mathbf{1111_2}$?
   A. $\mathbf{10000_2}$ **B.** $\mathbf{01000_2}$ **C.** $\mathbf{11110_2}$ **D.** $\mathbf{10110_2}$
3. What does the value of a number in any base system represent?
   A. The product of its digits **B.** The largest digit in the number **C.** The count of its digits **D.** The sum of each digit multiplied by its positional weight
4. What is the largest decimal number that can be represented using 3 bits in binary?
   A. **4**. **B.** **5**. **C.** **6**. **D.** **7**.

(b) Subtract **5 - 3** using **1's** complement and **2's** complement and explain the key differences.

Good Luck

Examiner: Dr. Mohammed Fadhil **Head of Dept.: Prof. Dr. Haider Jabbar Abd**

Quiz-2 **Student Name:** _____
Date: 17/5/2024
Digital Logic- UOMU028021: First Year
Lecturer: Dr. Mohammed Fadhil

Question 1: (3 points) **True/False:**

(a) In octal-to-binary conversion, each octal digit maps directly to a 4-bit binary group.

(b) The 2's complement method simplifies binary subtraction by converting it into addition.

(c) The hexadecimal number system uses base-8 and is commonly employed in memory addressing.

Question 2: (4 points) **Convert the hexadecimal number A3_{16} to its 8-bit binary equivalent.**

Question 3: (3 points) **Represent the decimal number -5 in 8-bit 1's complement form.**