ICS Assignment 1
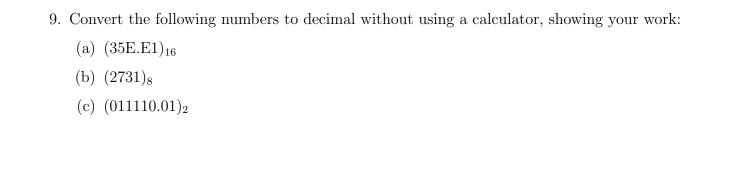
Name: ———————————— ID: ————————————

1. (   )In a computer, the ———— subsystem serves as a manager of the other subsystems.

   (A) ALU   (B) control unit   (C) input/output   (D) memory

2. (   )A step-by-step solution to a problem is called ————.

   (A) a computer language   (B) hardware   (C) an operating system
   (D) an algorithm

3. (   )When converting a decimal integer to base b, we repeatedly ———— b.

   (A) divide by   (B) multiply by (C) add to   (D) subtract from

4. (   )When converting a decimal fraction to base b, we repeatedly ———— b.

   (A) divide by   (B) multiply by (C) add to   (D) subtract from

5. (   )Which of the following represents the largest number?

   (A) $(11101001)_2$ (B) $(FA)_{16}$ (C) $(342)_8$ (D) 246

6. Explain the octal system. Why is it called *octal*? What is the base in this system?

7. What is the function of the ALU subsystem in a computer?

8. In a positional number system with base b, the largest integer number that can be respected using K digits is $b^K - 1$. Find the largest number in each of the following systems with *six* digits:

   (a) Binary

   (b) Decimal

   (c) Hexadecimal

   (d) Octal

9. Convert the following numbers to decimal without using a calculator, showing your work:

   (a) $(35E.E1)_{16}$

   (b) $(2731)_8$

   (c) $(011110.01)_2$

10. A number less than b^K can be represented using K digits in base b. Show the number of digits needed in each of the following cases.

   (a) Integers less than 2^{14} in binary

   (b) Integers less than 10^8 in decimal

   (c) Integers less than 8^{13} in hexadecimal

   (d) Integers less than 16^4 in octal