



*Computer Engineering Dept.
College of Engineering and Technology,
Arab Academy for Science, Technology & Maritime Transport
Abu Qir, Alexandria,
Egypt*

CC 216 (Winter 2004) Knowledge Test #1

Title: *Binary Systems*

1. What is meant by the base of a numbering system?
2. How many digits does each of the following numbering systems have: octal, hexadecimal, and binary?
3. What is the largest possible four-digit number in each of the four numbering systems?
4. Compare the four numbering systems, decimal, octal, hexadecimal, and binary, in terms of their representation of a value (e.g. 75).
5. Why are the decimal numbers 23 and 32 different in value when they both have the same digits?
6. How are positional weights used to convert a number from octal, hexadecimal, and binary, to decimal? Give an example.
7. In using the repetitive division procedure to convert from decimal to any one of the three numbering systems, what should the number to be converted be divided by?
8. Discuss the procedure used to convert a number from decimal to any one of the three other numbering systems: octal, hexadecimal, and binary. Give an example.
9. What is the purpose of the octal and hexadecimal numbering systems?
10. Why is the decimal numbering system not a good system for representing binary numbers?
11. Why can't we use the substitution procedure (combining digits) to convert from decimal to binary and vice versa?
12. What is the difference between the binary and BCD representations of decimal numbers?
13. Why is addition considered to be the most important arithmetic operation as far as digital computers are concerned?
14. Discuss the similarities and differences between binary and decimal addition.
15. Discuss the procedure used to represent a negative number without a sign.
16. Discuss how to identify the sign of a binary subtraction.
17. Discuss the procedure to perform multiplication using repetitive addition.
18. Discuss the procedure used to perform division using repetitive subtraction.
19. Why can't decimal numbers represented in BCD be added in the same manner as decimal numbers represented in binary?
20. Discuss the procedure used to add two BCD numbers.
21. What are binary codes used for?
22. Why is there a need for a standard code?
23. What is the purpose of parity?



Computer Engineering Dept.
College of Engineering and Technology,
Arab Academy for Science, Technology & Maritime Transport
Abu Qir, Alexandria,
Egypt

CC 216 (Winter 2004) Homework (1)

Title: *Digital Logic and Computer Design*

Score: / 100

Student name:

Student #:

Major:

Due on: 3/23/2004

Problems:

1.1, 1.2, 1.3, 1.4, 1.5 and 1.6 (see attached sheet)

#	Score	Comments
1.1	/8	
1.2	/8	
1.3	/12	
1.4	/24	
1.5	/36	
1.6	/12	

Student's feedback:

Notes: Use this page as the cover for your homework.

(Good Luck ☺)

- 1. Convert the following number to the specified base:**
 - i. $(FF32)_{16}$ to $(?)_8$
 - ii. $(10111)_8$ to $(?)_{10}$
 - iii. $(120.6)_{10}$ to $(?)_2$
 - iv. $(100100010101)_{BCD}$ to $(?)_{10}$

- 2. Convert the following numbers to binary, and then use the 1's complement to perform the subtractions:**
 - i. $(85)_{10} - (32)_{10}$
 - ii. $(F3)_{16} - (8B)_{16}$
 - iii. $(63)_8 - (12)_8$
 - iv. $(10101.011)_2 - (111.1)_2$

- 3. Add and multiply the following numbers:**
 - i. $(175)_8, (13)_8$
 - ii. $(2CA)_{16}, (3B)_{16}$
 - iii. $(1101)_2, (101)_2$

- 4. Design a Binary code to represent all the 52 playing cards using even parity for error detection. Explain your design.**

- 5. Using 7400 IC family, sketch and explain the function of the following IC's:**
 - i. 7404
 - ii. 7407
 - iii. 7408
 - iv. 7411
 - v. 7421
 - vi. 7432

- 6. Obtain the ASCII code of the following:**
 - i. A
 - ii. a
 - iii. 9
 - iv. \$
 - v. β
 - vi. \ddot{a}