Name: _____

Unit 01_000 – Arithmetic and Data Representation

Video Length 4:16

1. Will you be able to use a calculator on the exams?

2. Using the cheatsheet, What is $16x12$? _____

3. Do you anticipate a problem with not being able to use a calculator on the exam? If so, I will see if we can work together to figure out a solution.

——————————-

Unit 01_010 – Decimal

Video Length 10:15

4. What is any number raised to the zero power? ar _____

5. What is any number raised to the first power?

6. Why doesn't the base ten number system have a symbol for ten?

7. What number follows 999 in base ten?

——————————-

Unit 01_020 – Base 5

Video Length 4:45

Note: Base 5 will not be on the exam. The point of this video is to explain the system and how it applies to other bases.

The video is for base 5, but I will ask the following questions for base 3. If you understand the system, you should be able to apply the ideas to base 3.

8. What are the symbols used in base 3?

9. How would three be represented in base 3?   ar

10. What is 3^2 in base 10?

11. How would four be represented in base 3?

12. Count to fifteen in base 3.

13. What is 211_3 in base 10?

Unit 01_030 – Base 2 (Binary)

Video Length 13:00

14. What is Base 2 called?   ar

Fill in the following table. Write the powers of 2 in the second column.

Power of 2	Value
2^0	
2^1	
2^2	
2^3	
2^4	
2^5	
2^6	
2^7	
2^8	

15. How would you represent two in binary?

16. How would you represent three in binary?

17. Count to fifteen in binary.

Decimal	Binary
0	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	

18. What is 1011_2 in base 10?

19. What does 0b1111 mean? (Focus on the 0b)

Unit 01_040 – Base 16 (Hexadecimal)

Video Length 16:00

20. How would sixteen be written in base 16?

21. Write the powers of 16 in the following table.

Power of 16	Value
16^0	
16^1	
16^2	
16^3	

22. Fill in the columns for hexadecimal and binary. Write the binary as 4 digits.

Decimal	Hexadecimal	Binary
0	0	0000
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

23. A _____ is a group of 8 bits. A _____ is a group of 4 bits.

24. What is $d3_{16}$ in base 10?

Unit 01_050 – Convert from Decimal

Video Length 16:16

25. Convert 42_{10} to binary. Show your work.

26. Convert 134_{10} to hexadecimal. Show your work.

Unit 01_60 – Bit Space

Video Length 10:00

27. If you have 1 bit, how many different values can be stored?

28. Suppose you are a secret agent passing messages to your contact. You have an office with 5 windows. Each window has curtains that may either be open or closed (they cannot be set to half open). You give your contact a list of patterns of windows and the meaning of each message. How many different prearranged messages could you send to your contact using the five windows?

29. What is the general formula for figuring out how many combinations are possible with n bits?

Unit 01_070 – Bytes, Words, Double Words, and Quads

Video Length

30. What is a byte?

31. Why was Octal important in the past?

32. What is the problem with 6-bit computers?

33. Why does standard ASCII code have 127 different values?

34. How many bytes are in a word? _____ How many bits? _____

35. How many bytes are in a double word? _____ How many bits? _____ How many words? _____

36. How many bytes are in a quad? _____ How many bits? _____ How many words? _____

_____

Unit 01_080 – Binary Hexadecimal Conversion

Video Length

37. Do the following conversions. Do them directly. Remember to use the cheatsheet if you need it. {

   - 0b1011 1101 = 0x_____

   - 0b0111 1000 = 0x_____

   - 0b1111 1111 = 0x_____

   - 0b000 00000 = 0x_____
   - 0x3A = 0b_____

   - 0x12 = 0b_____

   - 0xAA = 0b_____

   _____

         _____

Do you have any questions or concerns? Please write any lingering questions you have here.