Programmable Logic Controllers 5th edition Petruzella Test Bank

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Programmable Logic Controllers 5th edition Petruzella Test Bank

Chapter 03 Test Bank KEY

1. The decimal system uses the number 9 as its base.

FALSE

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Easy
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.01 Decimal System
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

2. All digital computing devices perform operations in binary.

TRUE

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Easy
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.02 Binary System
Subtopic: Number System Characteristics
Units: Imperial

3. The base of a number system determines the total number of unique symbols used by that system.

TRUE

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Easy
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.01 Decimal System
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

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4. In any number system, the position of a digit that represents part of the number has a weighted value associated with it.

TRUE

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Easy
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.01 Decimal System
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

5. Usually a group of 8 bits is a byte, and a group of one or more bytes is a word.

TRUE

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Easy
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.02 Binary System
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

6. To express a number in binary requires fewer digits than in the decimal system.

FALSE

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Easy
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.02 Binary System
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

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7. The octal number system consists of digits 0, 1, 2, 3, 4, 5, 6, and 7. There are no 8s or 9s.

TRUE

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Difficulty: Easy
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.04 Octal System
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

8.

8. The hexadecimal number system consists of 16 digits including the numbers 0 through 9 and letters A through F.

TRUE

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Difficulty: Easy
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

9. In the Gray code there is a maximum of one bit change between two consecutive numbers.

TRUE

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Medium
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.07 Gray Code
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

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10. The radix of a number system is the same as the base.

TRUE

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Easy
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.01 Decimal System
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

11. Binary number systems use positive and negative symbols to represent the polarity of a number.

FALSE

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Medium
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.03 Negative Numbers
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

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12. The decimal system has as its base:

A.
2.

B.
5.

C.
8.

D.
10.

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Easy
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.01 Decimal System
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

13. Which of the following number systems has a base of 16?

A.
Hexadecimal

B.
Octal

C.
Binary-coded decimal

D.
Gray code

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Easy
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.05 Hexadecimal System
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

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14. In any number system, the position of a digit that represents part of the number has a "weight" associated with its value. The place weights for binary:

A.
start with 1 and are successive powers of 2.

B.
increase by adding 2 for each place, starting with 0.

C.
increase by adding 2 for each place, starting with 2.

D.
start with 2 and double for each successive place.

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Easy
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.01 Decimal System
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

15. The number 12 is:

A.
12 in any number system.

B.
12 in decimal.

C.
12 in binary.

D.
All of these choices are correct

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Easy
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.01 Decimal System
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

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16. The decimal number 15 would be written in binary as:

A.
1111.

B.
1000.

C.
4C.

D.
00011001.

Accessibility: Keyboard Navigation
Bloom's: Object 3. Procedural
Bloom's: Verb 3. Apply
Chapter: 03 Number Systems and Codes
Difficulty: Medium
Gradable: automatic
Learning Objective: Convert from one numbering or coding system to another
Subtopic: Number Conversions
Topic: Number Systems and Codes
Units: Imperial

17. The binary number 101 has the decimal equivalent of:

A.
3.

B.
101.

C.
41.

D.
5.

Accessibility: Keyboard Navigation
Bloom's: Object 3. Procedural
Bloom's: Verb 3. Apply
Chapter: 03 Number Systems and Codes
Difficulty: Easy
Gradable: automatic
Learning Objective: Convert from one numbering or coding system to another
Section: 03.02 Binary System
Subtopic: Number Conversions
Topic: Number Systems and Codes
Units: Imperial

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18. The number 127 could *not* be:

A.
decimal.

B.
hexadecimal.

C.
octal.

D.
binary.

Accessibility: Keyboard Navigation
Bloom's: Object 3. Procedural
Bloom's: Verb 3. Apply
Chapter: 03 Number Systems and Codes
Difficulty: Medium
Gradable: automatic
Learning Objective: Convert from one numbering or coding system to another
Section: 03.02 Binary System
Subtopic: Number Conversions
Topic: Number Systems and Codes
Units: Imperial

19. The octal number 153 would be written in binary as:

A.
011 101 001.

B.
001 101 011.

C.
011 111 101.

D.
010 100 011.

Accessibility: Keyboard Navigation
Bloom's: Object 3. Procedural
Bloom's: Verb 3. Apply
Chapter: 03 Number Systems and Codes
Difficulty: Medium
Gradable: automatic
Learning Objective: Convert from one numbering or coding system to another
Section: 03.04 Octal System
Subtopic: Number Conversions
Topic: Number Systems and Codes
Units: Imperial

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20. The binary number 101101 would be written in decimal as:

A.
21.

B.
36.

C.
45.

D.
62.

Accessibility: Keyboard Navigation
Bloom's: Object 3. Procedural
Bloom's: Verb 3. Apply
Chapter: 03 Number Systems and Codes
Difficulty: Medium
Gradable: automatic
Learning Objective: Convert from one numbering or coding system to another
Section: 03.02 Binary System
Subtopic: Number Conversions
Topic: Number Systems and Codes
Units: Imperial

21. The decimal number 28 would be written in binary as:

A.
11100.

B.
00111.

C.
10110.

D.
01011.

Accessibility: Keyboard Navigation
Bloom's: Object 3. Procedural
Bloom's: Verb 3. Apply
Chapter: 03 Number Systems and Codes
Difficulty: Medium
Gradable: automatic
Learning Objective: Convert from one numbering or coding system to another
Section: 03.02 Binary System
Subtopic: Number Conversions
Topic: Number Systems and Codes
Units: Imperial

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22. The octal number 62 would be written in decimal as:

A.
A12.

B.
F35.

C.
50.

D.
98.

Accessibility: Keyboard Navigation
Bloom's: Object 3. Procedural
Bloom's: Verb 3. Apply
Chapter: 03 Number Systems and Codes
Difficulty: Medium
Gradable: automatic
Learning Objective: Convert from one numbering or coding system to another
Section: 03.02 Binary System
Section: 03.04 Octal System
Subtopic: Number Conversions
Topic: Number Systems and Codes
Units: Imperial

23. The hexadecimal number C4 would be written in decimal as:

A.
21.

B.
48.

C.
182.

D.
196.

Accessibility: Keyboard Navigation
Bloom's: Object 3. Procedural
Bloom's: Verb 3. Apply
Chapter: 03 Number Systems and Codes
Difficulty: Medium
Gradable: automatic
Learning Objective: Convert from one numbering or coding system to another
Section: 03.04 Octal System
Subtopic: Number Conversions
Topic: Number Systems and Codes
Units: Imperial

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24. The hexadecimal number 2D9 would be written in binary as:

A.
0010 1101 1001.

B.
1001 1011 0010.

C.
1100 1111 0010.

D.
0010 1011 1001.

Accessibility: Keyboard Navigation
Bloom's: Object 3. Procedural
Bloom's: Verb 3. Apply
Chapter: 03 Number Systems and Codes
Difficulty: Medium
Gradable: automatic
Learning Objective: Convert from one numbering or coding system to another
Section: 03.04 Octal System
Subtopic: Number Conversions
Topic: Number Systems and Codes
Units: Imperial

25. The decimal number 213 would be written in BCD as:

A.
0010 0001 0011.

B.
1101 1000 1100.

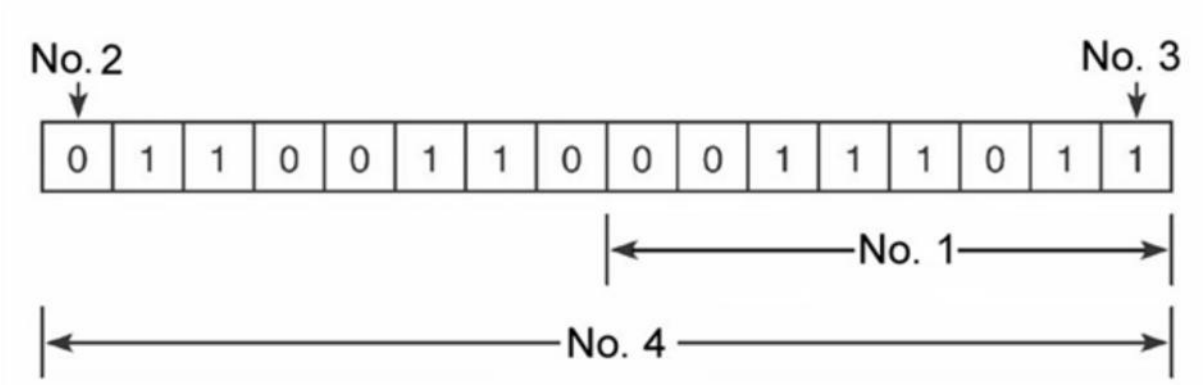
C.
0111 1001 0011.

D.
1011 1101 0101.

Accessibility: Keyboard Navigation
Bloom's: Object 3. Procedural
Bloom's: Verb 3. Apply
Chapter: 03 Number Systems and Codes
Difficulty: Medium
Gradable: automatic
Learning Objective: Convert from one numbering or coding system to another
Section: 03.06 Binary Coded Decimal (BCD) System
Subtopic: Number Conversions
Topic: Number Systems and Codes
Units: Imperial

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26. One byte of the data shown is represented by:



A.
No. 1.

B.
No. 2.

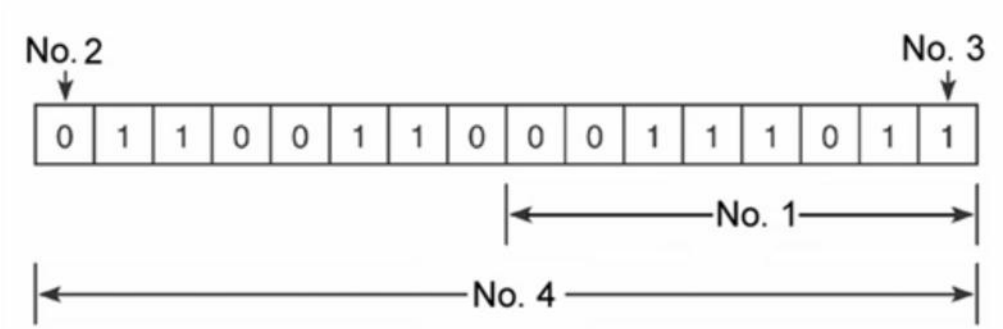
C.
No. 3.

D.
No. 4.

Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Easy
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.02 Binary System
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

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27. The MSB of the data shown in Figure 3-1 is represented by



A.
No. 1.

B.
No. 2.

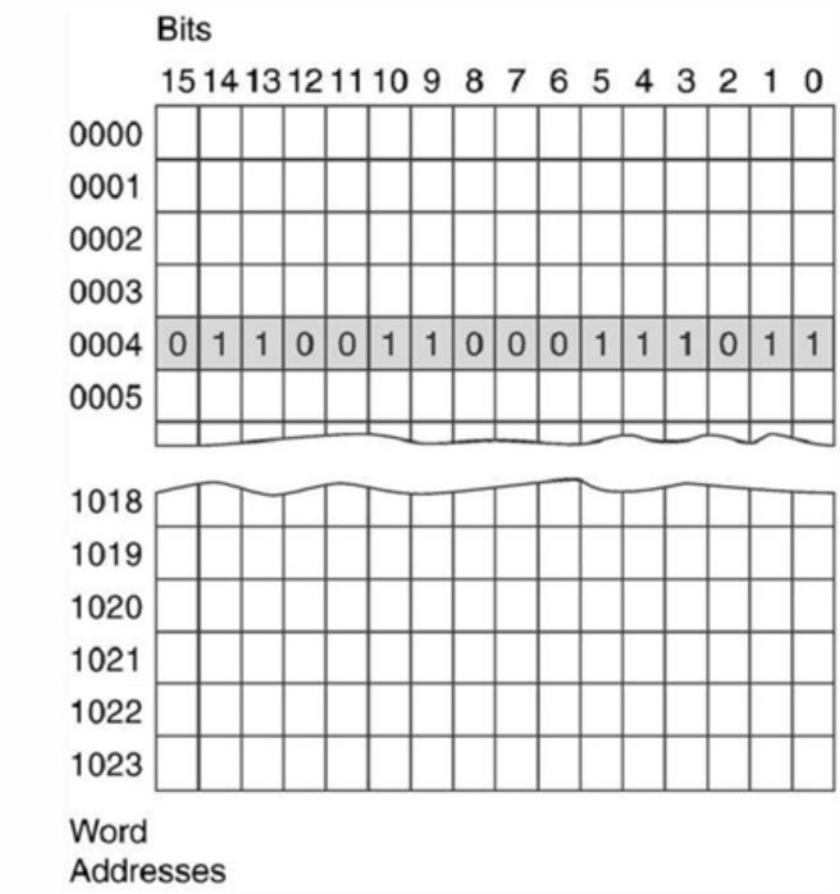
C.
No. 3.

D.
No. 4.

Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Easy
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.02 Binary System
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

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28. The memory size represented is:



A.
1023 K.

B.
1000 K.

C.
500 K.

D.
1 K.

Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Easy
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.02 Binary System
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

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29. The main advantage of using the Gray code is:

A. only one digit changes as the number increases.

B. it can be easily converted to decimal numbers.

C. large decimal numbers can be written using fewer digits.

D. it uses the number 2 as its base.

Accessibility: Keyboard Navigation
Bloom's: Object 2. Conceptual
Bloom's: Verb 2. Understand
Chapter: 03 Number Systems and Codes
Difficulty: Easy
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.07 Gray Code
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

30. The acronym BCD stands for:

A. binary-coded decimal.

B. binary code decoder.

C. base code decoder.

D. base-coded decimal.

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Easy
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.06 Binary Coded Decimal (BCD) System
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

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31. For a base 8 number system, the *weight value* associated with the third digit would be:

A.
16.

B.
32.

C.
64.

D.
512.

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Easy
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.04 Octal System
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

32. All digital computing devices operate using the binary number system because:

A.
most people are familiar with it.

B.
large decimal numbers can be represented in a shorter form.

C.
digital circuits can be easily distinguished between two voltage levels.

D.
All of these choices are correct

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Easy
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.02 Binary System
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

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33. If a given memory unit consists of 1250 16-bit words, the memory capacity would be rated:

A.
1250 bits.

B.
20,000 bits.

C.
3260 bits.

D.
156 bits.

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Easy
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.02 Binary System
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

34. In the sign bit position, a 1 indicates a(n):

A.
negative number.

B.
positive number.

C.
octal code.

D.
hexadecimal code.

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Easy
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.03 Negative Numbers
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

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35. The 2's complement form of a binary number is the binary number that results when:

A.
all the 1s are changed to 0s.

B.
all the 0s are changed to 1s.

C.
1 is added to 1s complement.

D.
both all the 1s are changed to 0s and all the 0s are changed to 1s.

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Medium
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.03 Negative Numbers
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

36. The ASCII code:

A.
is used with absolute encoders.

B.
is considered to be an error-minimizing code.

C.
includes letters as well as numbers.

D.
All of these choices are correct

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Easy
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.08 ASCII Code
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

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37. A(n) _____ bit is used to detect errors that may occur while a word is moved.

A.
parity

B.
negative

C.
positive

D.
overflow

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Easy
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.09 Parity Bit
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

38. All number systems use position weighting to represent the significance of an individual digit in a group of numbers.

TRUE

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Easy
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.01 Decimal System
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

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39. The base of a number system is the total number of individual symbols in that system.

TRUE

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Easy
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.01 Decimal System
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

40. The binary number system is based on two bytes.

FALSE

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Easy
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.02 Binary System
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

41. The digit of a binary number that has the lowest weight is called the Least Significant Bit.

TRUE

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Easy
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.02 Binary System
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

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42. A negative number in a digital system can be expressed by using the complement of a binary number.

TRUE

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Easy
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.03 Negative Numbers
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

43. PLCs use the 1's complement method for performing subtraction.

FALSE

Accessibility: Keyboard Navigation
Bloom's: Object 3. Procedural
Bloom's: Verb 3. Apply
Chapter: 03 Number Systems and Codes
Difficulty: Medium
Gradable: automatic
Learning Objective: Add, subtract, multiply, and divide binary numbers
Topic: Number Systems and Codes
Units: Imperial

44. Decimal values entered into a digital machine must be converted into binary form.

TRUE

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Easy
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.02 Binary System
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

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45. 1011 is a legitimate BCD number.

FALSE

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Medium
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.06 Binary Coded Decimal (BCD) System
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

46. Even parity is a method of adding a binary digit to a word to make the total number of 1s in the word even.

TRUE

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Medium
Gradable: automatic
Learning Objective: Know the characteristics of the numbering system codes
Section: 03.09 Parity Bit
Subtopic: Number System Characteristics
Topic: Number Systems and Codes
Units: Imperial

47. Decimal floating-point numbers usually take the form of scientific notation.

TRUE

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Medium
Gradable: automatic
Learning Objective: Add, subtract, multiply, and divide binary numbers
Section: 03.11 Floating Point Arithmetic
Subtopic: Addition and Subtraction, Multiplication and Division of Binary Numbers
Topic: Number Systems and Codes
Units: Imperial

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48. Double precision of floating point numbers requires 32-bits.

FALSE

Accessibility: Keyboard Navigation
Bloom's: Object 1. Factual
Bloom's: Verb 1. Remember
Chapter: 03 Number Systems and Codes
Difficulty: Medium
Gradable: automatic
Learning Objective: Add, subtract, multiply, and divide binary numbers
Section: 03.11 Floating Point Arithmetic
Subtopic: Addition and Subtraction, Multiplication and Division of Binary Numbers
Topic: Number Systems and Codes
Units: Imperial

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