

TEST A

CHAPTER 4, NUMERATION SYSTEMS

- _____ 1. Write in decimal notation:
 $5 \times 10^3 + 2 \times 10^2 + 9 \times 10$
- _____ 2. Write in decimal notation:
_____ a. 1101_2
_____ b. BA_{16}
_____ c. 324_5
_____ d. 751_8
- _____ 3. Change the number 31 to the stated base:
_____ a. base five
_____ b. base two
_____ c. base sixteen
_____ d. base eight
- _____ 4. Compute in base two:
_____ a. $1101_2 + 111_2$
_____ b. $1101_2 - 111_2$
- _____ 5. Compute in base two:
_____ a. $1011_2 \times 101_2$
_____ b. $101_2 \overline{) 100011_2}$
- _____ 6. Write in Egyptian numerals:
_____ a. 63
_____ b. 861
- _____ 7. Write in Babylonian numerals:
_____ a. 63
_____ b. 861
- _____ 8. Write in Roman numerals:
_____ a. 46
_____ b. 17,000
- _____ 9. Write in decimal notation: ▼ < ▼▼▼▼
- _____ 10. Write in decimal notation: ◡◡◡ ||||

11. Write in decimal notation:
 _____ a. XLVIII
 _____ b. $\overline{\text{LXVII}}$
12. Perform the multiplication 22×24 using
 _____ a. the Egyptian method of mediation and
 duplation.
 _____ b. the Egyptian method of successive
 duplication.
13. Fill in the blanks:
 _____ a. $x^a \cdot x^b = \underline{\hspace{2cm}}$
 _____ b. $\frac{x^m}{x^n} = \underline{\hspace{2cm}}$, $m > n$, $x \neq 0$
 _____ c. $x^0 = \underline{\hspace{2cm}}$, $x \neq 0$
14. Perform the indicated operations and leave
 the answers in exponential form:
 _____ a. $2^6 \cdot 2^7$
 _____ b. $\frac{2^8}{2^3}$
15. Write in expanded notation:
 _____ a. 3508
 _____ b. 862
- _____ 16. Find $745_8 + 256_8$
- _____ 17. Find $764_8 - 572_8$
- _____ 18. Find $46_8 \times 7_8$
- _____ 19. Find $621_8 \div 10_8$
- _____ 20. Find $BC_{16} + CD_{16}$

TEST B

CHAPTER 4, NUMERATION SYSTEMS

1. $\frac{2^8}{2^3} =$

- a. $\frac{8}{3}$
- b. 2^5
- c. 1^5
- d. $2^{8/3}$
- e. None of these

2. The number 3508 written in expanded notation is:

- a. $3 \times 10^3 + 5 \times 10^2 + 8$
- b. $35 \times 10^2 + 8$
- c. $3 \times 10^3 + 508$
- d. $3 \times 10^3 + 50 \times 10 + 8$
- e. None of these

3. Written in decimal notation, $5 \times 10^3 + 2 \times 10^2 + 9 \times 10 =$

- a. 5290
- b. 5029
- c. 5209
- d. 529
- e. None of these

4. What is the answer to the following multiplication problem?
$$\begin{array}{r} 1011_2 \\ (\times) \underline{101_2} \end{array}$$

- a. 1001101_2
- b. 1010101_2
- c. 110111_2
- d. 112221
- e. None of these

5. What is the answer to the following subtraction problem?
$$\begin{array}{r} 1011_2 \\ (-) \underline{101_2} \end{array}$$

- a. 9910
- b. 9910_2
- c. 1110_2
- d. 110
- e. 110_2

6. In Egyptian numerals, 861 is:

- a. $\begin{array}{c} \cup \cup \cup \textcircled{\cup} \textcircled{\cup} \textcircled{\cup} \textcircled{\cup} \textcircled{\cup} | \\ \cup \cup \cup \textcircled{\cup} \textcircled{\cup} \textcircled{\cup} \end{array}$
- b. $\begin{array}{c} \textcircled{\cup} \textcircled{\cup} \textcircled{\cup} \cup \cup \cup \cup | \\ \textcircled{\cup} \textcircled{\cup} \cup \cup \cup \cup \end{array}$
- c. $\begin{array}{c} \textcircled{\cup} \textcircled{\cup} \textcircled{\cup} \textcircled{\cup} \cup \cup \cup | \\ \textcircled{\cup} \textcircled{\cup} \textcircled{\cup} \cup \cup \cup \end{array}$
- d. $\begin{array}{c} \cup \cup \cup \cup \textcircled{\cup} \textcircled{\cup} \textcircled{\cup} \textcircled{\cup} | \\ \cup \cup \cup \textcircled{\cup} \textcircled{\cup} \end{array}$
- e. None of these.

7. In Babylonian numerals, 65 is
- a. $\langle \langle \langle \langle \langle \langle \blacktriangledown \blacktriangledown \blacktriangledown \blacktriangledown \blacktriangledown$ b. $\blacktriangledown \blacktriangledown \blacktriangledown \blacktriangledown \blacktriangledown \blacktriangledown$
c. $\blacktriangledown \blacktriangledown \blacktriangledown \blacktriangledown \blacktriangledown \blacktriangledown \blacktriangledown \blacktriangledown \blacktriangledown$ d. $\blacktriangledown \blacktriangledown \blacktriangledown \blacktriangledown \blacktriangledown \blacktriangledown$
e. None of these
8. In Roman numerals, 1986 is
- a. I IX VIII VI b. MCMLXXXVI c. CMMXXXLVI
d. IXX VIII VI e. None of these
9. In decimal notation, the Babylonian numeral $\blacktriangledown \langle \blacktriangledown \blacktriangledown \blacktriangledown \blacktriangledown$ is:
- a. 24 b. 74 c. 65
d. 614 e. None of these
10. In decimal notation, the Egyptian numeral $\cap \cap \cap \quad ||||$ is
- a. 34 b. 43 c. 64
d. 1114 e. None of these
11. In decimal notation, the Roman numeral XLVIII is
- a. 1058 b. 10,508 c. 43
d. 48 e. 68
12.

1	24
2	48
4	96
8	192
<u>16</u>	<u>384</u>
?	

The multiplication 22×24 by successive duplication is shown. What numbers should be marked with \ so that the corresponding numbers in the right hand column add up to the correct answer?
- a. 1, 2, 4 only b. 2, 4, 16 only c. All of them
d. 1 and 16 only e. None of these

13.
$$\begin{array}{r} 13 \quad 24 \\ 6 \quad 48 \\ 3 \quad 96 \\ \hline 1 \quad 192 \end{array}$$
 The multiplication of 24 by 13 by mediation and duplation is shown. Which numbers in the right hand column should be circled and added to obtain the product?

- a. All of them
 b. 24 and 192 only
 c. 24, 48, and 192 only
 d. 48 and 92 only
 e. 24, 96, and 192 only

14. Which of the following is (are) **INCORRECT**?

1. $x^m \cdot x^n = x^{mn}$ 2. $\frac{x^a}{x^b} = x^{a-b}$ for $a > b$ 3. $x^0 = 0$ for $x \neq 0$
 a. 2 only b. 3 only c. 1 and 3 only
 d. All three e. They are all correct.

15. $2^6 \cdot 2^7 =$

- a. 4^{13} b. 2^{13} c. 2^{42}
 d. 4^{42} e. None of these

16. Find $745_8 + 256_8$

- a. 1223_8 b. 1121_8 c. 1113_8
 d. 1023_8 e. None of these

17. Find $764_8 - 572_8$

- a. 162_8 b. 272_8 c. 262_8
 d. 172_8 e. None of these

18. Find $46_8 \times 7_8$

- a. 422_8 b. 402_8 c. 412_8
 d. 312_8 e. None of these

19. Find $621_8 \div 10_8$

- a. 62_8 b. $62_8 \text{ R } 1_8$ c. $62_8 \text{ R } 2$
 d. $62_8 \text{ R } 3_8$ e. None of these

20. Find $BC_{16} + CD_{16}$

- a. DE_{16} b. 188_{16} c. 179_{16}
 d. 189_{16} e. None of these