Chapter 2 Test A

Name:_____

Date:_____

Find the decimal equivalent for each of the following binary numbers.

1. 1011_2

1. _____

2. 11001011_2

2. _____

Find the binary equivalent for each of the following decimal numbers.

3. 22

3. _____

4. 106

4. _____

Add the following binary numbers.

5. 1001_2
   $+1100_2$

5. _____

6. 10010101_2
   $+11010010_2$

6. _____

Multiply each pair of binary numbers.

7. 1010_2
   $\times \quad 11_2$

7. _____

8. 10110_2
   $\times \quad 110_2$

8. _____

Perform the following binary subtractions.

9. 1010_2
   -0011_2

9. _____

10. 1110_2
    -1011_2

10. _____

Simplify each of the following by using long division. Some answers may have a remainder.

11. $10010_2 \div 11_2$

11. _____

12. $1011010_2 \div 10_2$

12. _____

Translate each of the following decimal numbers into two's complement notation. Use an 8-bit representation.

13. 78

13. _____

14. -127

14. _____

Each of the following numbers are in 8-bit, two's complement notation. Translate each into its decimal equivalent.

15. 10110011_{2*} **15.** _____

16. 00100110_{2*} **16.** _____

Add the following binary numbers in 4-bit, two's complement notation. Identify any overflow errors.

17. $\begin{array}{r} 1011_{2*} \\ +\,0101_{2*} \\ \hline \end{array}$ **17.** _____

18. $\begin{array}{r} 1110_{2*} \\ +\,0111_{2*} \\ \hline \end{array}$ **18.** _____

Find the decimal equivalent for each of the following binary numbers.

19. 101.101_2 **19.** _____

20. $\dfrac{10101_2}{1000000_2}$ **20.** _____

Find the binary equivalent for each of the following decimal numbers.

21. 0.65625   **21.** _____

22. 15.53125   **22.** _____

Use long division to convert each decimal fraction into a binary expansion.

23. $\dfrac{1}{6}$ **23.** _____

24. $\dfrac{3}{16}$ **24.** _____

25. Exactly how many *bytes* are in 256 MB?   **25.** _____

Name:_____

Chapter 2 Test B

Date:_____

Find the decimal equivalent for each of the following binary numbers.

1. 1010_2 1. _____

2. 10100111_2 2. _____

Find the binary equivalent for each of the following decimal numbers.

3. 78   3. _____

4. 111   4. _____

Add the following binary numbers.

5. $\begin{aligned}&1100_2\\+\,&1001_2\end{aligned}$ 5. _____

6. $\begin{aligned}&10001001_2\\+\,&10101010_2\end{aligned}$ 6. _____

Multiply each pair of binary numbers.

7. $\begin{aligned}&1011_2\\\times\quad&10_2\end{aligned}$ 7. _____

8. $\begin{aligned}&10101_2\\\times\quad&101_2\end{aligned}$ 8. _____

Perform the following binary subtractions.

9. $\begin{aligned}&1111_2\\-\,&1001_2\end{aligned}$ 9. _____

10. $\begin{aligned}&1010_2\\-\,&0101_2\end{aligned}$ 10. _____

Simplify each of the following by using long division. Some answers may have a remainder.

11. $11011_2 \div 11_2$ 11. _____

12. $1101101_2 \div 101_2$ 12. _____

Translate each of the following decimal numbers into two's complement notation. Use an 8-bit representation.

13. 83   13. _____

14. −66   14. _____

Each of the following numbers are in 8-bit, two's complement notation. Translate each into its decimal equivalent.

15. 11110000_{2*} 15. _____

16. 00001111_{2*} 16. _____

Add the following binary numbers in 4-bit, two's complement notation. Identify any overflow errors.

17. $\begin{array}{r} 1111_{2*} \\ + 1101_{2*} \\ \hline \end{array}$ 17. _____

18. $\begin{array}{r} 0101_{2*} \\ + 0010_{2*} \\ \hline \end{array}$ 18. _____

Find the decimal equivalent for each of the following binary numbers.

19. 10001.10001_2 19. _____

20. $\dfrac{10110_2}{10000000_2}$ 20. _____

Find the binary equivalent for each of the following decimal numbers.

21. 0.6328125   21. _____

22. 13.00390625   22. _____

Use long division to convert each decimal fraction into a binary expansion.

23. $\dfrac{7}{8}$ 23. _____

24. $\dfrac{5}{64}$ 24. _____

25. Exactly how many *bytes* are in 4 GB?   25. _____

Name:_____

Chapter 2 Test C

Date:_____

Find the decimal equivalent for each of the following binary numbers.

1. 1110_2

    (a) 12 **(b)** 13 **(c)** 14 **(d)** 15 **(e)** None of these

    1. _____

2. 10110001_2

    (a) 171 **(b)** 173 **(c)** 175 **(d)** 177 **(e)** None of these

    2. _____

Find the binary equivalent for each of the following decimal numbers.

3. 92

    (a) 1011110_2 **(b)** 1011100_2 **(c)** 1101100_2

    (d) 1011101_2 **(e)** None of these

    3. _____

4. 125

    (a) 1111101_2 **(b)** 1010100_2 **(c)** 1101110_2

    (d) 1010000_2 **(e)** None of these

    4. _____

Add the following binary numbers.

5. 1011_2
   $+1101_2$

    (a) 11001_2 **(b)** 10100_2 **(c)** 11010_2

    (d) 11000_2 **(e)** None of these

    5. _____

6. 11001110_2
   $+01100110_2$

    (a) 101110100_2 **(b)** 100110100_2 **(c)** 100110110_2

    (d) 110110100_2 **(e)** None of these

    6. _____

Multiply each pair of binary numbers.

7. 1110_2
    $\times\ \ \ \ 10_2$

    7. _____

    (a) 10101_2 **(b)** 11000_2 **(c)** 11100_2

    (d) 10100_2 **(e)** None of these

8. 11010_2
    $\times\ \ \ \ 101_2$

    8. _____

    (a) 10000010_2 **(b)** 10010010_2 **(c)** 10001010_2

    (d) 10000100_2 **(e)** None of these

Perform the following binary subtractions.

9. 1110_2
    $-\,0101_2$

    9. _____

    (a) 0001_2 **(b)** 1001_2 **(c)** 1011_2 **(d)** 0011_2 **(e)** None of these

10. 1111_2
    $-\,1101_2$

    10. _____

    (a) 0011_2 **(b)** 0101_2 **(c)** 0001_2 **(d)** 0010_2 **(e)** None of these

Simplify each of the following by using long division.

11. $11000_2 \div 11_2$

    11. _____

    (a) 1010_2 **(b)** 1000_2 **(c)** 1100_2 **(d)** 1001_2 **(e)** None of these

12. $1111010_2 \div 10_2$

    12. _____

    (a) 101101_2 **(b)** 111101_2 **(c)** 111100_2 **(d)** 100101_2 **(e)** None of these

Translate each of the following decimal numbers into two's complement notation. Use an 8-bit representation.

13. 41

    13. _____

    (a) 101011_{2*} **(b)** 101101_{2*} **(c)** 110001_{2*}

    (d) 101001_{2*} **(e)** None of these

14. -112

    14. _____

    (a) 10010100_{2*} **(b)** 10010000_{2*} **(c)** 10001000_{2*}

    (d) 10000100_{2*} **(e)** None of these

Each of the following numbers are in 8-bit, two's complement notation. Translate each into its decimal equivalent.

15. 10110101_{2*} 15. _____

    (a) −75   **(b)** 75   **(c)** −181   **(d)** 181   **(e)** None of these

16. 01100110_{2*} 16. _____

    (a) 102   **(b)** −102   **(c)** 154   **(d)** −154   **(e)** None of these

Add the following binary numbers in 4-bit, two's complement notation. Identify any overflow errors.

17. 1000_{2*}
     $+0110_{2*}$ 17. _____

    (a) 1001_{2*} **(b)** 1010_{2*} **(c)** 1110_{2*}

    (d) 1101_{2*} **(e)** None of these

18. 1110_{2*}
     $+1011_{2*}$ 18. _____

    (a) $(1)0001_{2*}$ **(b)** $(1)0101_{2*}$ **(c)** $(1)1001_{2*}$

    (d) $(1)1101_{2*}$ **(e)** None of these

Find the decimal equivalent for each of the following binary numbers.

19. 111.1101_2 19. _____

    (a) 7.78125   **(b)** 7.8125   **(c)** 7.6875

    (d) 7.40625   **(e)** None of these

20. $\dfrac{1101_2}{10000_2}$ 20. _____

    (a) 0.75   **(b)** 0.9375   **(c)** 0.8125

    (d) 0.875   **(e)** None of these

Find the binary equivalent for each of the following decimal numbers.

21. 0.140625   **21.** _____

    (a) 0.00101_2 **(b)** 0.001001_2 **(c)** 0.0010001_2

    (d) 0.000101_2 **(e)** None of these

22. 18.8125   **22.** _____

    (a) 1010.1101_2 **(b)** 1100.1101_2 **(c)** 10010.1011_2

    (d) 10010.11_2 **(e)** None of these

Use long division to convert each decimal fraction into a binary expansion.

23. $\dfrac{9}{16}$ **23.** _____

    (a) 0.101_2 **(b)** 0.1001_2 **(c)** 0.10001_2

    (d) 0.10011_2 **(e)** None of these

24. $\dfrac{3}{32}$ **24.** _____

    (a) 0.0011_2 **(b)** 0.000011_2 **(c)** 0.00101_2

    (d) 0.00011_2 **(e)** None of these

25. Exactly how many *bytes* are in 64 K?   **25.** _____

    (a) 64,000   **(b)** 67,108,864   **(c)** 65,536

    (d) 512   **(e)** None of these

Chapter 2 Test A Answers

1. 11
2. 203
3. 10110_2
4. 1101010_2
5. 10101_2
6. 101100111_2
7. 11110_2
8. 10000100_2
9. 111_2
10. 11_2
11. 110_2
12. 101101_2
13. 01001110_{2*}
14. 10000001_{2*}
15. -77
16. 38
17. 0000_{2*}
18. 0101_{2*}
19. 5.625
20. 0.328125
21. 0.10101_2
22. 1111.10001_2
23. $0.00\overline{10}_2$
24. 0.0011_2
25. 268,435,456 or 256×2^{20}

Chapter 2 Test B Answers

1. 10

2. 167

3. 1001110_2

4. 1101111_2

5. 10101_2

6. 100110011_2

7. 10110_2

8. 1101001_2

9. 110_2

10. 101_2

11. 1001_2

12. 10101_2 R 100_2

13. 01010011_{2*}

14. 10111110_{2*}

15. -16

16. 15

17. Error

18. 0111_{2*}

19. 17.53125

20. 0.171875

21. 0.1010001_2

22. 1101.00000001_2

23. 0.111_2

24. 0.000101_2

25. 4,294,967,296 or 4×2^{30}

Chapter 2 Test C Answers

1. (c)

2. (d)

3. (b)

4. (a)

5. (d)

6. (b)

7. (c)

8. (a)

9. (b)

10. (d)

11. (b)

12. (b)

13. (d)

14. (b)

15. (a)

16. (a)

17. (c)

18. (c)

19. (b)

20. (c)

21. (b)

22. (e)

23. (b)

24. (d)

25. (c)