Sheet2: Number System

- **The submitted solutions should be handwritten and NOT typed/printed.**
- **The students will lose 3 marks if this homework not delivered on time.**

Part1

1. Use hexadecimal notation to represent the following bit patterns:

a) 110101011110010 (Lab)
b) 111010000101010100010111
c) 01001000

2. What bit patterns are represented by the following hexadecimal patterns?

a. 5FD97 (Lab)
b. 610A
c. ABCD
d. 0100

3. Convert each of the following binary representations to its equivalent base ten forms:

a. 101010 (Lab)
b. 100001
c. 10111

4. Convert each of the following base ten representations to its equivalent binary form:

a. 32 (Lab)
b. 64
c. 96
d. 15

5. Express each number as a decimal number.

a. 263_8 (Lab)
b. $B21_{16}$ (Lab)
c. 5100_8 2
d. $100E_{16}$
e. 100332_8
f. 10011_{16}

6. Express each number as a binary number.

a. 2524_8 (Lab)
b. $BAC9_{16}$ (Lab)
c. 332210_8
d. $4009D_{16}$

7. Express each number as an octal number.

a. 1010010001_2 (Lab)
b. 1001010000100010_2
c. $B78_{16}$ (Lab)
d. 1234_{16}
e. 101_{10} (Lab)
f. 55_{10}

8. Express each number as a hexadecimal number.

a. 1010100000010101010_2
b. 1010101010_2
c. 2526_8 (Lab)
d. 50004734_8
e. 202_{10} (Lab)
f. 400_{10}

Part 2

9. Convert the following bit pattern to decimal fraction

a) 0.112 (Lab)
b) 0.01012
c) 1.1010112
d) 1.1012

10. Convert the following octal fraction to decimal fraction

a) 21. 218 (Lab)
b) 0.3578
c) 100.018

11. Convert the following hexadecimal fraction to decimal fraction

a) EF. B116 (Lab)
b) 0.9D916
c) BBC.1016
d) 41A. EF916

12. Convert the following decimal fraction to binary fraction

a) 0.2510 (Lab)
b) 0.62510
c) 13.687510

13. Convert the following octal fraction to binary fraction

a) 15.1238 (Lab)
b) 0.1428
c) 32.258
d) 0.1238

14. Convert the following hexadecimal fraction to binary fraction

a) 1.F316 (Lab)
b) 3B25.E16
c) 100.0116

15. Convert the following decimal fraction to octal fraction

a) 0.51310 (Lab)
b) 14.4610
c) 6.3210

16. Convert the following binary fraction to octal fraction

a) 101111.00111112 (Lab)
b) 10.00112
c) 1.001112
d) 101.1012

17. Convert the following hexadecimal fraction to octal fraction

a) 3.F16 (Lab)
b) ABC.DE16
c) C.28416
d) 22.D16

18. Convert the following decimal fraction to hexadecimal fraction

a) 0.062810 (Lab)
b) 11.664062510
c) 0.333310

19. Convert the following binary fraction to hexadecimal fraction

a) 101111.00111112 (Lab)
b) 11101100100101.1112
c) 1001.00112

20. Convert the following octal fraction to hexadecimal fraction

a) 12.38 (Lab)
b) 2.478
c) 245. 378

21. Perform the following additions in binary notation

a)

a. 0101	b. 0011	c. 0101	d. 1110	e. 1010
+ 0010 (Lab)	+ 0001	+ 1010	+ 0011	+ 1110

22. Perform the following additions in binary fraction

a)10.101 + 1.111 (Lab)
b) 0.1010 + 0.010

23. Perform the following subtractions in binary fraction

a. (Lab) b. 10.101 + 1.111 c. 0.1010 + 0.010

With my best wishes;
Dr. Heba Hamdy