**Exercise: Number System**

**Reference Solutions**

1. **Convert decimal to binary, octal, hexadecimal**
2. (11)10 = (1011)2 = (13)8 = (B)16
3. (255)10 = (1111 1111)2 = (377)8 = (FF)16
4. **Conversion between binary, octal and hexadecimal**
5. (777)8 = (1 1111 1111)2 = (1FF)16
6. (122)8 = (1010010)2 = (52)16
7. (AA)16 = (10101010)2 = (252)8
8. (11100001)2 = (341)8 = (E1)16
9. **Convert binary, octal, hexadecimal to decimal**
10. (101)2 = (5)16 = (5)8 = (5)10
11. (1110)2 = (E)16 = (16)8 = (14)10
12. (1000 0001)2 = (81)16 = (201)8 = (129)10
13. (1001 1001)2 = (99)16 = (231)8 = (153)10
14. (1.11)2 = (1.75)10
15. (14.6)8 = (12.75)10
16. **Conversion from** **Decimal**

**Note: If the fractional part exceeds 4 digits, only 4 digits are reserved.**

1. (0.5)10 = (0.1)2 = (0.4)8 = (0.8)16
2. (1.25)10 = (1.01) 2= (1.2)8 = (1.4)16
3. (0.35)10 = (0.0101 ...) 2= (0.2631 ...)8 = (0.5999 ...)16
4. (0.88)10 = (0.1110 ...)2 = (0.7024 ...)8 = (0.e147 ...) 16
5. **Arithmetic**
6. (1234)8 + (4576)8 = (6032)8
7. (A1)16 \* (6B)16 = (434B)16
8. **Two’s Complement**
9. (11011000) is the bit pattern in 8-bit 2’s complement representation for decimal number -40.
10. The smallest negative integer for n-bit 2’s complement representation is (-2n-1).
11. Decimal (-107) is equivalent to 8-bit 2’s complement number 10010101.
12. **Floating-Point Numbers**
13. (0 01111100 00000000000000000000000) is the floating-point representation of decimal 0.125.
14. (1 10000101 11111100100000000000000) is the floating-point representation of decimal -127.125.
15. 1 10000010 10100000000000000000000 is the floating-point representation of decimal (-13).
16. 1 10000010 11100100000000000000000 is the floating-point representation of decimal (-15.125).
17. 0 10000110 11011001000000000000000 is the floating-point representation of decimal (236.5).