**Exercise: Number System**

**Reference Solutions**

1. **Convert decimal to binary, octal, hexadecimal**
2. (13)10 = (1101)2 = (15)8 = (D)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. (252)8 = (1010 1010)2 = (AA)16
7. (ABCD)16 = (1010 1011 1100 1101)2 = (125715)8
8. **Convert binary, octal, hexadecimal to decimal**
9. (101)2 = (5)16 = (5)8 = (5)10
10. (1110)2 = (E)16 = (16)8 = (14)10
11. (1000 0001)2 = (81)16 = (201)8 = (129)10
12. (1001 1001)2 = (99)16 = (231)8 = (153)10
13. (1.11)2 = (1.75)10
14. (14.6)8 = (12.75)10
15. **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. (0.77)10 = (0.1100 ...) 2= (0.6121 ...)8 = (0.c51e ...)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 + (7654)8 = (11110)8
7. (A3)16 \* (AC)16 = (6D84)16
8. **Two’s Complement**
9. (1101 1111) is the bit pattern in 8-bit 2’s complement representation for decimal number -33.
10. The smallest negative integer for n-bit 2’s complement representation is (-2n-1).
11. Decimal (-123) is equivalent to 8-bit 2’s complement number 10000101.
12. **Floating-Point Numbers**
13. (0 01111100 01000000000000000000000) is the floating-point representation of decimal 0.15625.
14. (1 10000101 11111101000000000000000) is the floating-point representation of decimal -127.25.
15. 1 10000010 11010000000000000000000 is the floating-point representation of decimal (-14.5).
16. 1 10000010 11100100000000000000000 is the floating-point representation of decimal (-15.125).
17. 0 10000110 01010100100000000000000 is the floating-point representation of decimal (170.25).