

1. (2 pts) What is the value of 7 in the number 987,916,350.

2. (3 pts) Write the Hindu-Arabic numeral in expanded form: 310,481

3. (6 pts) Convert  $1010101_2$  to base nine.

4. (20 pts) Convert the following to Hindu-Arabic numeral:

a. MMCDLXXVI

b.  $\overline{\text{IV}}\text{DCXLIV}$

c.  $6073_8$

d.  $AD95_{16}$

5. (15 pts) Convert the following to a numeral in the base indicated:

a. 149 to base four.

b. 675 to base seven.

c. 857 to base twelve.

6. (10 pts) Write each Hindu-Arabic numeral as a Roman numeral:

a. 3478

b. 5867

7. (10 pts) Add the following in the indicated base using the technique given in the book and the lecture notes.

a. 
$$\begin{array}{r} 6642_7 \\ \underline{5414_7} \end{array}$$

b. 
$$\begin{array}{r} 58B1_{12} \\ \underline{7A48_{12}} \end{array}$$

8. (10 pts) Subtract the following in the indicated base using the technique given in the book and the lecture notes.

$$\begin{array}{r} \text{a. } 7642_8 \\ \underline{4354_8} \end{array}$$

$$\begin{array}{r} \text{b. } 9441_{12} \\ \underline{1A38_{12}} \end{array}$$

9. (12 pts) Multiply the following in the indicated base using the technique given in the book and the lecture notes.

$$\begin{array}{r} \text{a. } 245_6 \\ \times 42_6 \\ \hline \end{array}$$

$$\begin{array}{r} \text{b. } A76_{12} \\ \times 8_{12} \\ \hline \end{array}$$

10. (6 pts) Multiply  $351 \times 143$  using duplation and mediation method.

11. (6 pts) Multiply  $548 \times 237$  using lattice multiplication.