1. Expand the following brackets:

   a. $(2x + 3y)^4$ **b.** $(x - 2y)^5$ **c.** $(x + y)^7$

2. Create a 7-digit password such that it starts with two odd numbers, followed by four letters selected from the list (A, B, C, D and E), and the last two digits are two numbers greater than 5. How many different such passwords can be created?
3. In an event, 10 guests are present. If all the guests shake hands with each other, how many hand-shakings will occur?
4. If you have 8 shirts, 5 pairs of jeans and 4 pairs of shoes, how many different outfits you can wear?
5. A basket contains 10 fruits which are apples, oranges and bananas. In how many ways you can choose 3 fruits?
6. Your university is holding a football tournament. The organizer wants to select 3 students from your class which has 20 students, to be the main referee, the right and the left assistant referees. In how many ways this can be done?
7. Convert **19**, **14** and **8** to binary numbers.
8. Convert **11100**, **1011** and **1000010** to decimal numbers.
9. Write **7620**, **4952** and **574** in Roman numbers.
10. Convert the following Roman numbers to decimal numbers: **MCLIX**, **CMXCIX**, $\overline{\text{VI}}\text{IV}$

11. Calculate the following mods:

12 mod 5

29 mod 3

13 mod (-6)

4 mod 7

45 mod 3

34 mod 7

-15 mod 19

- 14 mod 5

-21 mod 3

-10 mod (-4)

-17 mod (-5)