Tutorial 10

1. There are 70 students in a class. The class teacher decided to organize two competitions – singing and dancing. Every student has to participate in at least one competition. The students who participate in the dance competition, also get a chance to perform during the annual function. The student who participated in both the activities get an additional 10 points in general proficiency, 50 students participate in the singing competition and only 30 students do not get additional points in their general proficiency. Find the number of students who get the chance to perform during the annual function, but do not get additional points.

2. Encrypt the word 'BOOK' and 'PARK' using the Ceaser cipher system

$$f(p) = p + 3(mod\ 26)$$

(**Note: Read about the method of Ceaser Cipher**)

3. A bag has some pens. If these pens were equally distributed to
(i) four students, then three pens left in the bag.
(ii) five students, then two pens left in the bag.
(iii) seven students, then four pens left in the bag.
Find the minimum number of pens in the bag.

4. Solve the following linear congruence equations:
(a) $2x \equiv 3(mod\ 5)$
(b) $3x \equiv 2(mod\ 8)$

5. In a survey about hobbies, it is found that 35 people like only singing, 20 like only playing, 25 like only cooking, 10 like singing and playing, 15 like playing and cooking, 8 like cooking and singing and 5 like all the three. Find the following:
(a) Number of people who like singing.
(b) Number of people who like cooking.
(c) Number of people who like playing.
(d) Number of people included in the survey.