Q2.

1 - 1000 Numbers / Integers.

a) How many of them are not divisible by 3 nor by 5 nor by 7.

Let, A = Divisible by 3.

B = Divisible by 5.

C = Divisible by 7.

$$A \cap B \cap C = \frac{1000}{3 \times 5 \times 7} = 9.$$

$$|A| = \frac{1000}{3} = 333, \quad |B| = \frac{1000}{5} = 200$$

$$|C| = \frac{1000}{7} = 142, \quad |A \cap B| = \frac{1000}{3 \times 5} = 66$$

$$|B \cap C| = \frac{1000}{5 \times 7} = 28 \quad |A \cap C| = \frac{1000}{3 \times 7} = 47$$

The Integers divisible by 3, 5 & 7 will be, $A \cup B \cup C$.

$\Rightarrow A \cup B \cup C = |A| + |B| + |C| - |A \cap B| - |A \cap C| - |B \cap C| + |A \cap B \cap C|.$

$A \cup B \cup C = 333 + 42 + 200 - 66 - 47 - 28 + 9$

$A \cup B \cup C = 543.$

∴ Integers which are not divisible by 3 nor by 5 nor 7 are;

$$1000 - 543 = 457.$$

∴

b) How many of them are not divisible by 5 or 7 but divisible by 3.

∴ $|B \cup C| = |B| + |C| - |B \cap C|$

$$= 200 + 142 - 28$$

$$|B \cup C| = 314.$$

No. divisible by 3
3, 5, 7 and

Integers not divisible by 5 or 7 but divisible by 3.

$$= |A \cup B \cup C| - |B \cup C|$$

$$= 543 - 314$$

$$= 229.$$

229 numbers or Integers are divisible by 3 but not by 5 & 7.