

SECTION-3

ANS-1

Answer (i)

Clearly out of the 370 students who read newspaper, 23 must read both as simply adding given 393 students,

Proof by set theory

$$A \cup B = A + B - A \cap B$$

$$A \cap B = 200 + 193 - 370$$

$$A \cap B = 23.$$

23 students reads both the news paper

SECTION - 3

ANS - 1

Answer (ii)

We know that -

$$-1 < \cos 3x < 1$$

multiply by -1 on all the sides we get,

$$1 > -\cos 3x > -1 \quad [\text{as multiplying by } -1 \text{ changes the inequality sign}]$$

add 2 on all the sides we get,

$$3 > 2 - \cos 3x > 1$$

now take the reciprocal of this whole expression we get -

$$\frac{1}{3} < \frac{1}{2 - \cos 3x} < 1$$

thus the range of the required expression is from $[\frac{1}{3}, 1]$