PROBABILITY

T SIVA PARVATHI - FWC22089

16.4.5 [1] **Out of 100 students, two sections of 40 and 60 are formed. If you and your friend are among the 100 students, what is the probability that**
(a) you both enter the same section?
(b) you both enter the different sections?

Solution:
100 students divided into two sections 40 and 60,

RV	Values	Description
X	{0,1}	0: sectioin1, 1: section2
Y	{0,1}	0: student1, 1: student2
XY	{001,101,00,01,10,11}	Students enter same and different sections

Table 2: Random variables(RV) X and Y

(a)both enter the same section

$$\Pr(001) = \frac{{}^{40}C_2}{{}^{100}C_2} \tag{16.4.5.1}$$

$$\Pr(101) = \frac{{}^{60}C_2}{{}^{100}C_2} \tag{16.4.5.2}$$

Probability that two students enter same section,

$$\Pr(001) + \Pr(101) = \frac{156}{990} + \frac{354}{990} = 0.51 \tag{16.4.5.3}$$

(b)both enter different section
Probability that two students enter different section = 1-0.51 = 0.49

[1] Read question numbers as (CHAPTER NUMBER).(EXERCISE NUMBER).(QUESTION NUMBER)