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}	Students enter same section
	{00,01,10,11}	Students enter different section

Table 2: Random Variables(RV) X, Y and XY

(a) both enter the same section

$$\Pr(001) = \frac{{}^{40}C_2}{{}^{100}C_2} \tag{16.4.1.1}$$

$$\Pr(101) = \frac{{}^{60}C_2}{{}^{100}C_2} \tag{16.4.1.2}$$

Probability that two students enter same section,

$$\Pr(001) + \Pr(101) = \frac{156}{990} + \frac{354}{990} = 0.51 \tag{16.4.1.3}$$

(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)