# Question 11.16.3.27
# Probability and Random Processes

Sarvesh K
EE22BTECH11046*

**Question:11/16/3/27**

If the probabilities for A to fail in an examination is 0.2 and that for B is 0.3, then the probability that either A or B fails is

1) $> 0.5$
2) $0.5$
3) $\leq 0.5$
4) $0$

**Solution:**

| parameters | values | decription |
|---|---|---|
| $X$ | 1 | A fails |
| | 0 | A doesn't fail |
| $Y$ | 1 | B fails |
| | 0 | B doesn't fail |

TABLE 4: Random variable description

Since $X$ and $Y$ are independent

$$p_{XY}(k,m) = p_X(k)\, p_Y(m) \tag{1}$$

$$= \begin{cases} 0.06 & k=1, m=1 \\ 0.14 & k=1, m=0 \\ 0.24 & k=0, m=1 \\ 0.56 & k=0, m=0 \end{cases} \tag{2}$$

The desired probability is

$$= p_{XY}(11) + p_{XY}(10) + p_{XY}(01) \tag{3}$$

$$= 1 - p_{XY}(00) \tag{4}$$

$$= 1 - 0.56 \tag{5}$$

$$= 0.44 \tag{6}$$

$$\leq 0.5 \tag{7}$$