

# PROBABILITY

HARI VENKATESWARLU - FWC22058

- 13.1.11** <sup>1</sup> Two groups are competing for the position on the Board of directors of a corporation. The probabilities that the first and the second groups will win are 0.6 and 0.4 respectively. Further, if the first group wins, the probability of introducing a new product is 0.7 and the corresponding probability is 0.3 if the second group wins. Find the probability that the new product introduced was by the second group

**Solution:**

| RV | Values | Description |
|----|--------|-------------|
| X  | {1,2}  | Groups      |
| Y  | {3}    | New Product |

Table 2: Random variables(RV) X,Y

| Event    | Probability | Description             |
|----------|-------------|-------------------------|
| P(1)     | 0.6         | First group winning     |
| P(2)     | 0.4         | Second group winning    |
| P(3   1) | 0.7         | Introducing 3 if 1 wins |
| P(3   2) | 0.3         | Introducing 3 if 2 wins |

Table 4: Probabilities

$$\Pr(2 | 3) = \frac{\Pr(2) \Pr(3 | 2)}{\Pr(1) \Pr(3 | 1) + \Pr(2) \Pr(3 | 2)} \quad (13.1.11.1)$$

$$\Rightarrow \Pr(2 | 3) = \frac{(0.4)(0.3)}{(0.6)(0.7) + 0.4(0.3)} \quad (13.1.11.2)$$

$$\Rightarrow \Pr(2 | 3) = \frac{2}{9} \quad (13.1.11.3)$$

---

<sup>1</sup>Read question numbers as (CHAPTER NUMBER).(EXERCISE NUMBER).(QUESTION NUMBER)