PROBABILITY

UDAY KUMAR - FWC22086

13.1.6 [1]If $\Pr(A)=\frac{1}{2}$,$\Pr(B)=0$,then $\Pr(A \mid B)$ is [1ex]

(a) 0

(b) $\frac{1}{2}$

(c) not defined

(d) 1

Solution:
From the defnition of conditional probability

$$\Pr(A \mid B) = \frac{\Pr(AB)}{\Pr(B)} \tag{13.1.4.1}$$

$$P(B) = 0 \implies B = \emptyset \tag{13.1.4.2}$$

$$AB = \emptyset \tag{13.1.4.3}$$

$$\Pr(AB) = 0 \tag{13.1.4.4}$$

$$\Pr(A \mid B) = \frac{P(AB)}{P(B)} \tag{13.1.4.5}$$

$$\Pr(A \mid B) = \frac{0}{0} \tag{13.1.4.6}$$

$\therefore \Pr(A \mid B)$ is not defined

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