

Let  $S = \{a, b, c, d\}$  be a sample space for an experiment. Let  $E$  be the event that  $a$  is not observed and  $F$  be the event that  $d$  is not observed. What is the event that either  $E$  occurs but  $F$  does not occur, or else  $F$  occurs but  $E$  does not occur?

- (a)  $\{a, d\}$
- (b)  $\{a, b, c, d\}$
- (c)  $\{b, c\}$
- (d)  $\{a, b, c\}$
- (e)  $\{b, c, d\}$
- (f)  $\{a, c, d\}$
- (g)  $\{a\}$
- (h)  $\{d\}$
- (i)  $\emptyset$
- (j) None of these

Let  $S = \{a, b, c, d\}$  be a sample space for an experiment. Which of the following two events are disjoint?

- (a)  $\{b, c\}$  and  $\{a, d\}$
- (b)  $\{b, c\}$  and  $\{a, b, d\}$
- (c)  $\{a, b, d\}$  and  $\{c, d\}$
- (d)  $\{a, b, c, d\}$  and  $\{a, b\}$
- (e)  $\{d\}$  and  $\{a, c, d\}$
- (f)  $\{a\}$  and  $\{a\}$
- (g)  $\{a, b, c, d\}$  and  $\{a, b, c, d\}$
- (h)  $\{a, c\}$  and  $\{b, c\}$
- (i)  $\{a, b, c, d\}$  and  $\{a, d\}$
- (j) None of these

Let  $S = \{a, b, c, d\}$  be a sample space for an experiment. Suppose the probabilities of observing  $a$ ,  $b$ ,  $c$ ,  $d$ , are  $1/2$ ,  $1/4$ ,  $1/6$ ,  $1/12$ , respectively. What is the probability that either  $\{b, c\}$  or  $\{c, d\}$  or both occur?

- (a)  $1/2$
- (b)  $2/3$
- (c)  $5/48$
- (d)  $1/3$
- (e)  $3/4$
- (f)  $3/8$
- (g)  $1/4$
- (h)  $0$
- (i)  $1$
- (j) None of these