

**S1.** Let  $E, F, G$  be three events. Find expressions for the events that out of  $E, F, G$ ,

- (a) only  $F$  occurs,
- (b) both  $E$  and  $F$  but not  $G$  occurs,
- (c) at least one event occurs,
- (d) at least two events occur,
- (e) all three events occur,
- (f) none occurs,
- (g) at most one occurs,
- (h) at most two occur.

(Hint: The answer for (c) is  $E \cup F \cup G$ .)

**S2.** A coin is to be tossed until a head appears twice in a row. What is the sample space for this experiment? What is the probability that the coin will be tossed exactly four times?

**S3.** Let  $E, F, G$  be three events. Find  $P\{E \cup F \cup G\}$  function of  $P\{E\}, P\{F\}, P\{G\}, P\{E \cap F\}, P\{E \cap G\}, P\{F \cap G\}$ , and  $P\{E \cap F \cap G\}$ .

**S4.** Let  $E$  and  $F$  be two events. Show that  $P\{E \cap F\} \geq P\{E\} + P\{F\} - 1$ .