

PRACTICE QUESTIONS COMBINED EVENTS**EXERCISE – 2.8**

1. Events A and B are such that $P(A|B) = \frac{2}{5}$, $P(B) = \frac{1}{4}$, $P(A) = \frac{1}{3}$ Find
- (a) $P(A \cap B)$
 - (b) $P(B|A)$
 - (c) $P(A^c|B^c)$
- (Ans : 1/10, 3/10, 31/45)
2. Events C and D are such that $P(C) = \frac{4}{7}$, $P(C \cap D') = \frac{1}{3}$, $P(C|D) = \frac{5}{14}$
- Find
- (a) $P(C \cap D)$
 - (b) $P(D)$
 - (c) $P(D|C)$
- (Ans : 5/21, 2/3, 5/12)
3. Two Events A and B are such that, $P(A) = \frac{8}{15}$, $P(B) = \frac{1}{3}$, $P(A|B) = \frac{1}{5}$
- Calculate the probabilities that
- (a) both events occur
 - (b) only one of the two events occur
 - (c) neither event occurs
- (Ans : 1/15, 11/15, 1/5)
4. Two events A and B are such that $P(A) = 0.2$, $P(B) = 0.3$, $P(A \cup B) = 0.4$. Find the following probabilities
- (a) $P(A \cap B)$
 - (b) $P(A^c \cup B^c)$
 - (c) $P(A^c \cap B^c)$
 - (d) $P(A^c|B)$
- (Ans : 0.1, 0.9, 0.6, 2/3)
5. The Events A and B are such that, $P(A) = 0.45$, $P(B) = 0.35$, $P(A \cup B) = 0.7$
- Find
- (a) $P(A \cap B)$
 - (b) $P(A|B)$
 - (c) $P(A \cap B')$
 - (d) $P(A^c|B)$
 - (e) $P(A^c|B^c)$
- (Ans : 1/10, 2/7, 7/20, 5/7, 6/13)

6. If A and B are independent events with $P(A) = 0.5$ and $P(B) = 0.2$, find the following probabilities
 (a) $P(A \cup B)$ (b) $P(A^c \cap B^c)$ (c) $P(A^c \cup B^c)$
 (Ans : 3/5, 2/5, 9/10)
7. A and B are two independent events such that $P(A) = 0.2$ and $P(B) = 0.15$. Evaluate the following probabilities.
 (a) $P(A|B)$ (b) $P(A \cap B)$ (c) $P(A \cup B)$
 (Ans : 0.2, 0.03, 0.32)
8. The probability that an event occurs is $P(A) = 0.4$, B is an event independent of A and probability of the union of A and B is $P(A \cup B) = 0.7$. Find
 (a) $P(B)$ (b) $P(A \cap B)$ (c) $P(A|B) + P(B|A)$
 (Ans : 0.5, 0.2, 0.9)
9. Events A and B are such that, $P(A) = 0.4$ and $P(B) = 0.25$. If A and B are independent events, find
 (a) $P(A \cap B)$ (b) $P(A \cap B^c)$ (c) $P(A^c \cap B^c)$ (d) $P(A|B)$ (e) $P(A^c|B^c)$
 (Ans : .0.1, 0.3, 0.45, 0.4, 0.6)
10. There are 90 applicants for a job with the news department of a television station. Some of them are college graduates and some are not; some of them have at least three years' experience and some have not, with the exact breakdown being

	College graduates	Not college graduates
At least three years' experience	18	9
Less than three years' experience	36	27

If the order in which the applicants are interviewed by the station manager is random, G is the event that the first applicant interviewed is a college graduate, and T is the event that the first applicant interviewed has at least three years' experience, determine each of the following probabilities directly from the entries and the row and column totals of the table:

- (a) $P(G)$; (b) $P(T')$; (c) $P(G \cap T)$;
 (d) $P(G' \cap T')$; (e) $P(T|G)$; (f) $P(G'|T')$.

(Ans : 3/5, 7/10, 1/5, 3/10, 1/3, 3/7)