1. An experiment involves rolling a pair of dice and recording the numbers that come up. Describe the following events.

A : The sum is greater than 8.

B : 2 occurs on either die.

C : The sum is at least 7 and a multiple of 3.

Which pair of these events is mutually exclusive?

(1) both A and C (2) both B and C

(3) both A and B (4) all A, B and C

2. Minimum number of times a fair coin must be tossed so that the probability of getting at least one **head** is more than 99% is:

(1) 8 (2) 6

(3) 5 (4) 7

3. Events A, B & C are mutually exclusive events such that $P(A)=\frac{3x+1}{3}$, $P(B)=\frac{1-x}{4}$ and $P(C)=\frac{1-2x}{2}$, then the complete set of possible values of x is

(1) $\left[\frac{1}{3},\frac{2}{3}\right]$ (2) $\left[\frac{1}{3},\frac{13}{3}\right]$

(3) $[0,1]$ (4) $\left[\frac{1}{3},\frac{1}{2}\right]$

4. If $P(B)=\frac{3}{4}$, $P\left(A\cap B\cap \bar{C}\right)=\frac{1}{3}$ and $P\left(\bar{A}\cap B\cap \bar{C}\right)=\frac{1}{3}$, then $P(B\cap C)$ is

(1) $\frac{1}{12}$ (2) $\frac{1}{6}$

(3) $\frac{1}{15}$ (4) $\frac{1}{9}$

5. Four persons independently solve a certain problem correctly with probabilities $\frac{1}{2}$, $\frac{3}{4}$, $\frac{1}{4}$, $\frac{1}{8}$. The probability that the problem is solved correctly by at least one of them is P, then what is the value of $256P$?

6. Given two independent events, if the probability that both the events occur is $\frac{8}{49}$, the probability that exactly one of them occurs is $\frac{26}{49}$ and the probability of more probable of the two events is λ, then 14λ is equal to

(1) 2 (2) 4

(3) 8 (4) 7

7. If A and B are any two events such that $P(A)=\frac{2}{5}$ and $P(A\cap B)=\frac{3}{20}$, then the conditional probability, $P\left(A\middle|\left(A'\cup B'\right)\right)$, where A' denotes the complement of A, is equal to :

(1) $\frac{11}{20}$ (2) $\frac{5}{17}$

(3) $\frac{8}{17}$ (4) $\frac{1}{4}$

8. An urn contains 6 white and 4 black balls. A fair die is rolled and that number of balls are chosen from the urn. Find the probability that balls selected are white.

9. If from a pack of 52 well shuffled cards, cards are drawn one by one without replacement and the third card is found to be ACE. What is the probability that first two cards are not $ACES$?

(1) $\frac{260}{329}$ (2) $\frac{376}{425}$

(3) $\frac{161}{329}$ (4) None of these

10. A and B alternately cut a card each from a pack of cards with replacement and pack is shuffled after each cut. If A starts the game and the game is continued till one cuts a spade, the respective probabilities of A and B cutting a spade are

(1) $\frac{1}{3},\frac{2}{3}$ (2) $\frac{3}{4},\frac{1}{4}$

(3) $\frac{4}{7},\frac{3}{7}$ (4) $\frac{3}{7},\frac{4}{7}$