Probability

Q.No.1:
A multiple choice examination has 5 questions. Each question has three alternative answers of which exactly one is correct. The probability that a student will get 4 or more correct answers just by guessing is:

JEE 2013

A. $\frac{17}{3^5}$

B. $\frac{13}{3^5}$

C. $\frac{11}{3^5}$

D. $\frac{10}{3^5}$

Q.No.2: Let two fair six-faced dice A and B be thrown simultaneously. If E_1 is the event that die A shows up four, E_2 is the event that die B shows up two and E_3 is the event that the sum of numbers on both dice is odd, then which of the following statements is NOT true ? **JEE 2016**

A. E_2 and E_3 are independent

B. E_1 and E_3 are independent

C. E_1, E_2 and E_3 are independent

D. E_1 and E_2 are independent

Q.No.3: For three events A, B and C, P(Exactly one of A or B occurs) = P(Exactly one of B or C occurs) = P(Exactly one of C or A occurs) = $\frac{1}{4}$ and P (All the three events occur simultaneously) = $\frac{1}{6}$. Then the probability that at least one of the events occurs, is : **JEE 2017**

A. $\frac{7}{32}$

B. $\frac{7}{16}$

C. $\frac{7}{64}$

D. $\frac{3}{16}$

Q.No.4: A box contains 15 green and 10 yellow balls. If 10 balls are randomly drawn, one-by-one, with replacement, then the variance of the number of green balls drawn is **JEE 2017**

A. $\frac{12}{5}$

B. 6

C. 4

D. $\frac{6}{25}$

Q.No.5: A bag contains 4 red and 6 black balls. A ball is drawn at random from the bag, its colour is observed and this ball along with two additional balls of the same colour are returned to the bag. If now a ball is drawn at random from the bag, then the probability that this drawn ball is red, is : **JEE 2018**

A. $\frac{1}{5}$

B. $\frac{3}{4}$

C. $\frac{3}{10}$

D. $\frac{2}{5}$

Q.No.6: Two cards are drawn successively with replacement from a well-shuffled deck of 52 cards. Let X denote the random variable of number of aces obtained in the two draw cards. Then P(X = 1) + P(X = 2) equals: **JEE 2019**

A. 49/169

B. 52/169

C. 24/169

D. 25/169

Q.No.7: An urn contains 5 red and 2 green balls. A ball is drawn at random from the urn. If the drawn ball is green, then a red ball is added to the urn and if the drawn ball is red, then a green ball is added to the urn; the original ball is returned to the urn. Now, a second ball is drawn at random from it. The

probability that the second ball is red, is: **JEE 2019**

A. $\frac{21}{49}$

B. $\frac{27}{49}$

C. $\frac{26}{49}$

D. $\frac{32}{49}$

Q.No.8: A bag contains 30 white balls and 10 red balls. 16 balls are drawn one by one randomly from the bag with replacement. If X be the number of white balls drawn, then $\left(\frac{\text{mean of X}}{\text{standard deviation of X}}\right)$ is equal to : **JEE 2019**

A. 4

B. $4\sqrt{3}$

C. $3\sqrt{2}$

D. $\frac{4\sqrt{3}}{3}$

Q.No.9: In a game, a man wins Rs. 100 if he gets 5 or 6 on a throw of a fair die and loses Rs. 50 for getting any other number on the die. If he decides to throw the die either till he gets a five or a six or to a maximum of three throws, then his expected gain/loss (in rupees) is: **JEE 2019**

A. $\frac{400}{9}$ loss

B. 0

C. $\frac{400}{3}$ gain

D. $\frac{400}{3}$ loss

Q.No.10: The mean and the variance of five observations are 4 and 5.20, respectively. If three of the observations are 3, 4 and 4; then the absolute value of the difference of the other two observations, is: **JEE 2019**

A. 7

B. 5

C. 1

D. 3