MATHS

BOOKS - DHANPAT RAI & CO MATHS (HINGLISH)

PROBABILITY

Illustration

1. Six dice are thrown simultaneously. The probability that all of them show the same face, is

A. $\frac{1}{6^6}$

B. $\frac{1}{6^5}$

C. $\frac{1}{6}$

D. none of these

Answer: B

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2. Six dice are thrown simultaneously. The probability that all of them show the different faces, is

A. $\frac{1}{6^5}$

B. $\frac{6!}{6^6}$

C. $\frac{1}{6!}$

D. $\frac{5!}{6!}$

Answer: B

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3. Six dice are thrown simultaneously. The probability that exactly three of them show the same face and ramining three show different faces, is

A. $\frac{(5!)^2}{6^5}$

B. $\frac{5!}{2!6^6}$

C. $\frac{(5!)^2}{2(6^6)}$

D. $\frac{5!}{2(6^6)}$

Answer: C

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4. Three numbers are chosen from 1 to 30. The probability that they are not consecutive is

A. $\frac{142}{145}$

B. $\frac{144}{145}$

C. $\frac{143}{145}$

D. $\frac{1}{145}$

Answer: B

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5. A die is tossed twice. The prbability of having a number greater than 4 on each toss is

A. $\frac{1}{3}$

B. $\frac{1}{9}$

C. $\frac{2}{3}$

D. $\frac{1}{12}$

Answer: B

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6. Suppose $n(\geq 3)$ persons are sitting in a row. Two of them are selected at random. The probability that they are not together is

A. $1-\frac{1}{n}$

B. $1-\frac{2}{n}$

C. $\frac{2}{n+1}$

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

Answer: B

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7. If six students, including two particular students A and B, stand in a row, then the probability that A and B are separated with one student in between them is

A. $8/15$

B. $1/5$

C. $2/15$

D. $4/15$

Answer: D

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8. A sum of money is rounded off to the nearest rupee, find the probability that the round off error is at least ten paise.

A. $\frac{81}{100}$

B. $\frac{82}{101}$

C. $\frac{19}{100}$

D. $\frac{19}{101}$

Answer: A

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9. Three different numbers are selected at random from the set $A = \{1, 2, 3, \ldots., 10\}$. The probability that the product of two of the numbers is equal to the third is

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

B. $\frac{1}{40}$

C. $\frac{1}{8}$

D. $\frac{39}{40}$

Answer: B

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10. Three numbers are chosen at random from numbers 1 to 30. The probability that the minimum of the chosen numbers is 9 and maximum is 25, is

A. $\frac{1}{406}$

B. $\frac{1}{812}$

C. $\frac{3}{812}$

D. none of these

Answer: C

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11. Three natural numbers are taken at random from the set of first 100 natural numbers. The probability that their A.M. is $25,$ is

A. $\frac{{}^{77}C_2}{{}^{100}C_3}$

B. $\frac{{}^{25}C_2}{{}^{100}C_3}$

C. $\frac{{}^{74}C_{72}}{{}^{100}C_{97}}$

D. none of these

Answer: C

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12. The probability that out of 10 person, all born in June, at least two have the same birthday is

A. $\frac{.^{30}C_{10}}{(30)^{10}}$

B. $\frac{.^{30}C_{10}}{30!}$

C. $\frac{30^{10} - .^{30}C_{10}}{30^{10}}$

D. none of these

Answer: C

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13. Five persons entered the lift cabin on the ground floor of an 8 floor house. Suppose that each of them independently and with equal probability can leave the cabin at any floor beginning with the first, then the probability of al 5 persons leaving at different floor is a. $\frac{^7P_5}{7^5}$ b. $\frac{7^5}{^7P_5}$ c. $\frac{6}{^6P_5}$ d. $\frac{^5P_5}{5^5}$

A. $\frac{.^7C_5}{7^5}$

B. $\frac{.^7C_5 \times 5!}{5^7}$

C. $\frac{.^7C_5 \times 5!}{7^5}$

D. $\frac{5!}{7^5}$

Answer: C

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14. A elevator starts with m passengers and stops at n floors $(m \leq n)$. The probability that no two passengers leaves at same floor

A. $\frac{.^{n}P_{m}}{m^{n}}$

B. $\frac{.^{n}P_{m}}{n^{m}}$

C. $\frac{.^{n}C_{m}}{m^{n}}$

D. $\frac{.^{n}C_{m}}{n^{m}}$

Answer: B

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15. Find the probability that the birth days of six different persons will fall in exactly two calendar months.

A. $\frac{1}{6}$

B. $.^{12}C_2 \times \frac{2^6}{12^6}$

C. $.^{12}C_2 \times \frac{2^6 - 1}{12^6}$

D. $\frac{341}{12^5}$

Answer: D

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16. Twelve balls are distributed among three boxes, find the probability that the first box will contains three balls.

A. $\frac{2^9}{3^{12}}$

B. $\frac{.^{12}C_3 \times 2^9}{3^{12}}$

C. $\frac{.^{12}C_3 \times 2^{12}}{3^{12}}$

D. $\frac{.^{12}C_3}{12^3}$

Answer: B

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17. Two numbers b and c are chosen at random with replacement from the numbers $1, 2, 3, 4, 5, 6, 7, 8 \text{ and } 9$. The probability that $x^2 + bx + c > 0$ for all $x \in R$ is

A. $\frac{10}{27}$

B. $\frac{31}{81}$

C. $\frac{32}{81}$

D. $\frac{11}{27}$

Answer: C

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18. A 2×2 square matrix is written down at random using the number 1, -1 as elements. The probability that the matrix is non-singular is

A. $1/2$

B. $3/8$

C. $5/8$

D. $1/3$

Answer: A

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19. Two persons each make a single throw with a- pair of dice. The probability that the throws are equal, is

A. $\frac{73}{648}$

B. $\frac{73}{1296}$

C. $\frac{182}{648}$

D. none of these

Answer: A

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20. If n biscuits are distributed among N beggars, find the chance that a particular beggar will get `r(

A. $\frac{(N-1)^{n-r}}{N^n}$

B. $\frac{.^nC_r}{N^{n-r}}$

C. $\frac{.^nC_r(N-1)^r}{N^n}$

D. $\frac{.^nC_r(N-1)^{n-r}}{N^n}$

Answer: D

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21. A die is rolled thrice, find the probability of getting a larger number each time than the previous number.

A. $\frac{5}{54}$

B. $\frac{5}{216}$

C. $\frac{15}{216}$

D. none of these

Answer: A

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22. What is the probability that four S's come consecutively if all the letters of the word $'MISSISSIPPI'$ are rearranged randomly?

A. $\frac{1}{165}$

B. $\frac{2}{165}$

C. $\frac{4}{165}$

D. none of these

Answer: C

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23. There are n stations between two cities A and B. A train is to stop at three of these n stations. What is the probaility that no two of these three stations are consecutive ?

A. $\frac{n-3}{n(n-1)}$

B. $\frac{(n-3)(n-4)}{(n-1)(n-2)}$

C. $\frac{n-4}{n(n-1)}$

D. $\frac{(n-3)(n-4)}{n(n-1)}$

Answer: D

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24. Out of $3n$ consecutive integers, there are selected at random. Find the probability that their sum is divisible by 3.

A. $\frac{n\left(3n^2-3n+2\right)}{2}$

B. $\frac{3n^2 - 3n + 2}{2(3n-1)(3n-2)}$

C. $\frac{3n^2 - 3n + 2}{(3n-1)(3n-2)}$

D. $\frac{n(3n-1)(3n-2)}{3(n-1)}$

Answer: C

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25. Two natural numbers x and y are chosen at random from the set $\{1, 2, 3, 4, \ldots 3n\}$. find the probability that $x^2 - y^2$ is divisible by 3.

A. $\frac{5n-3}{2(3n-1)}$

B. $\frac{5n-3}{3(3n-1)}$

C. $\frac{3n-1}{(5n-3)}$

D. $\frac{3n-1}{2(5n-3)}$

Answer: B

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26. If two different numbers are taken from the set $\{0, 1, 2, 3, , 10\}$; then the probability that their sum as well absolute difference are both multiple of 4, is: $\frac{14}{45}$ (2) $\frac{7}{55}$ (3) $\frac{6}{55}$ (4) $\frac{12}{55}$

A. $\frac{6}{55}$

B. $\frac{12}{55}$

C. $\frac{14}{45}$

D. $\frac{7}{55}$

Answer: A

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27. Two numbers a and b are chosen at random from the set {1,2,3,..,3n}. The probability that $a^3 + b^3$ is divisible by 3, is

A. $\frac{1}{2}$

B. $(1)(4)$

C. $\frac{1}{6}$

D. $\frac{1}{3}$

Answer: D

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28. Two numbers a and b are chosen at random from the set {1,2,3,..,5n}. The probability that $a^4 - b^4$ is divisible by 5, is

A. $\frac{17n-5}{25n-1}$

B. $\frac{17n+5}{5(5n-1)}$

C. $\frac{17n-5}{5(5n-1)}$

D. none of these

Answer: C

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29. Two non-negative integers x and y are chosen at random with replacement. The probability that $x^2 + y^2$ is divisible by 10, is

A. $\frac{9}{50}$

B. $\frac{9}{25}$

C. $\frac{3}{50}$

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

Answer: A

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30. Two numbers are selected at random from 1,2,3,....100 and are multiplied, then the probability correct to two places of decimals that the product thus obtained is divisible by 3, is

A. $\frac{67}{150}$

B. $\frac{83}{150}$

C. $\frac{67}{75}$

D. $\frac{8}{75}$

Answer: B

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31. The digits 1,2,3,4,5,6,7,8 and 9 are written in random order to form a nine digit number. The probability that this number is divisible by 4, is

A. $\frac{1}{9}$

B. $\frac{2}{3}$

C. $\frac{2}{9}$

D. $\frac{7}{9}$

Answer: C

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32. Each coefficient in the equation $ax^2 + bx + c = 0$ is determined by throwing an ordinary six faced die. Find the probability that the equation will have real roots.

A. $\frac{42}{216}$

B. $\frac{41}{216}$

C. $\frac{43}{216}$

D. $\frac{39}{216}$

Answer: C

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33. The probability that the graph of $y = 16x^2 + 8(a + 5)x - 7a - 5 = 0,$ is strictly above the x-axis, If $a \in [-20, 0]$

A. $\frac{17}{20}$

B. $\frac{13}{20}$

C. $\frac{7}{20}$

D. $\frac{3}{20}$

Answer: B

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34. Two points are taken at random on the given straight line segment of length a. The probability for the distance between them to exceed a given length c, where $0 < c < a$, is

A. $\left(1 - \frac{c}{a}\right)^2$

B. $\left(1 - \frac{a}{c}\right)^2$

C. $1 - \frac{c^2}{a^2}$

D. $1 - \frac{a^2}{c^2}$

Answer: A

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35. If $P(A) = 1/4, P(B) = 1/2, P(A \cup B) = 5/8,$ then $P(A \cap B)$ is

A. $3/8$

B. $1/8$

C. $2/8$

D. $5/8$

Answer: B

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36. A die is thrown. Let A be the event that the number obtained is greater than 3. Let B be the event that the number obtained is less than

5. Then $P(A \cup B)$ is

A. 1

B. $2/5$

C. $3/5$

D. 0

Answer: A

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37. If A and B are arbitrary events, then a) $P(A \cap B) \geq P(A) + P(B)$ (b) $P(A \cup B) \leq P(A) + P(B)$ (c) $P(A \cap B) = P(A) + P(B)$ (d)None of these

A. $P(A \cap B) \geq P(A) + P(B)$

B. $P(A \cup B) \leq P(A) + P(B)$

C. $P(A \cap B) = P(A) + P(B)$

D. none of these

Answer: B

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38. If A and B are two given events, then $P(A \cap B)$ is

A. not less than P(A)+P(B)-1

B. not greater than $P(A) + P(B) - P(A \cup B)$

C. equal to $P(A) + P(B) + P(A \cap B)$

D. equl to $P(A) + P(B) + P(A \cup B)$

Answer: A

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39. If $A_1, A_2, \ldots, A_n$ are any n events, then

A. $P(A_1 \cup A_2 \cup .. \cup A_n) = P(A_1) + P(A_2) + .. + P(A_n)$

B. $P(A_1 \cup A_2 \cup .. \cup A_n) > P(A_1) + P(A_2) + .. + P(A_n)$

C. $P(A_1 \cup A_2 \cup .. \cup A_n) \leq P(A_1) + P_{A_2} + .. + P(A_n)$

D. none of these

Answer: C

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40. An integer is chosen at random from first 200 positive integers. Find the probability that the integer is divisible by 6 or 8.

A. $1/3$

B. $1/4$

C. $1/5$

D. none of these

Answer: B

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41. Odds in favour of an event A are 2 to 1 and odds in favour of $A \cup B$ are 3 to 1. Consistant with his information the smallest and largest values for the probability of event B are given by

A. $\frac{1}{6} \leq P(B) \leq \frac{1}{3}$

B. $\frac{1}{3} \leq P(B) \leq \frac{1}{2}$

C. $\frac{1}{12} \leq P(B) \leq \frac{3}{4}$

D. none of these

Answer: C

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42. Find the probability of 53 Sundays and 53 Mondays in a leap year.

A. $\frac{2}{7}$

B. $\frac{4}{7}$

C. $\frac{3}{7}$

D. $\frac{1}{7}$

Answer: C

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43. 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 :

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

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

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

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

Answer: D

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44. 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 :

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

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

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

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

Answer: B

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45. Let A, B and C be three events such that $P(A) = 0.3, P(B) = 0.4, P(C) = 0.8, P(A \cap B) = 0.08, P(A \cap C) = 0.2$. If $P(A \cup B \cup C) \geq 0.75$, then $P(B \cap C)$ satisfies

A. $P(B \cap C) \leq 0.23$

B. $P(B \cap C) \leq 0.48$

C. $0.23 \leq P(B \cap C) \leq 0.48$

D. $0.23 \leq P(B \cap C) \leq 0.64$

Answer: C

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46. A die is thrown twice and the sum of the numbers appearing is observed to be 6. What is the conditional probability that the number 4 has appeared at least once?

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

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

C. $\frac{5}{36}$

D. $\frac{1}{36}$

Answer: B

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47. Two integers are selected at random from integers 1 through 11. If the sum is even, find the probability that both the numbers are odd.

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

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

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

D. $\frac{4}{5}$

Answer: A

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48. A bag contains 10 white and 15 black balls. Two balls are drawn in succession without replacement. What is the probability that first is white and second is black?

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

B. $\frac{5}{8}$

C. $\frac{1}{4}$

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

Answer: C

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49. Find the probability of drawing a diamond card in each of the two consecutive draws from a well shuffled pack of cards, if the card drawn is not replaced after the first draw.

A. $\frac{4}{17}$

B. $\frac{13}{17}$

C. $\frac{1}{17}$

D. none of these

Answer: C

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50. Two balls are drawn from an urn containing 2 white; 3 red and 4 black balls one by one without replacement. What is the probability that at least one ball is red?

A. $\frac{7}{12}$

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

C. $\frac{2}{3}$

D. $\frac{5}{8}$

Answer: A

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51. A consignment of 15 record players contains 4 defectives. The record players are selected at random, one by one, and examined. The one is examined, are not put back. Then the probability that 9th one examined is the last defective, is

A. $\frac{.^{4}C_{3} \times .^{11}C_{5}}{.^{15}C_{8}}$

B. $\frac{.^{4}C_{3} \times .^{11}C_{5}}{.^{15}C_{8}} \times \frac{1}{7}$

C. $\frac{.^{11}C_{5}}{.^{15}C_{8}} \times \frac{1}{7}$

D. $\frac{.^{4}C_{3}}{.^{11}C_{5}} \times \frac{1}{7}$

Answer: B

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52. It is given that the events A and B are such that $P(A) = \frac{1}{4}, P\left(\frac{A}{B}\right) = \frac{1}{2} and p\left(\frac{B}{A}\right) = \frac{2}{3}$. Then P(B) is: (1) $\frac{1}{6}$ (2) $\frac{1}{3}$ (3) $\frac{2}{3}$ (4) $\frac{1}{2}$

A. $\frac{2}{3}$

B. $\frac{1}{2}$

C. $\frac{1}{6}$

D. $\frac{1}{3}$

Answer: D

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53. One ticket is selected at random from 50 tickets numbered 00, 01, 02, ... , 49. Then the probability that the sum of the digits on the selected ticket is 8, given that the product of these digits is zero, equals (1) 1/14 (2) 1/7 (3) 5/14 (4) 1/50

A. $\frac{1}{14}$

B. $\frac{1}{7}$

C. $\frac{5}{14}$

D. $\frac{1}{50}$

Answer: A

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54. Let $XandY$ be two events that $P(X)=\frac{1}{3}, P(X|Y)=\frac{1}{2} and P(Y|X)=\frac{2}{5}$ then: $P(Y)=\frac{4}{15}$ (b) $P(X\cup Y)=\frac{2}{5}$ $P(X'|Y)=\frac{1}{2}$ (d) $P(X\cap Y)=\frac{1}{5}$

A. $P(X/Y)=\frac{1}{2}$

B. $P(X\cap Y)=\frac{1}{5}$

C. $P(X\cup Y)=\frac{2}{5}$

D. $P(Y)=\frac{4}{15}$

Answer: A::D

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55. 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 $P(A \mid (A' \cup B'))$ where A' denotes the complement of $A$is equal to

A. $\frac{8}{17}$

B. $\frac{1}{4}$

C. $\frac{5}{17}$

D. $\frac{11}{20}$

Answer: C

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56. Let A and B be two events such that $p(\overline{A} \cup B) = \frac{1}{6}, p(A \cap B) = \frac{1}{4}$ and $p(\overline{A}) = \frac{1}{4}$, where $\overline{A}$ stands for the complement of the event A. Then the events A and B are (1) mutually exclusive and independent (2) equally likely but not independent (3) independent but not equally likely (4) independent and equally likely

A. mutually exclusive and independent

B. independent but not equally likely

C. equally likely but not independent

D. equally likely and mutually exclusive

Answer: B

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57. Two aeroplanes I and II bomb a target in succession. The probabilities of I and II scoring a hit correctly are 0.3 and 0.2, respectively. The second

plane will bomb only if the first misses the target. The probability that the target is hit by the second plane is (1) 0.06 (2) 0.14 (3) 0.2 (3) 0.7

A. 0.2

B. 0.7

C. 0.06

D. 0.14

Answer: D

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58. If $P(A) = \frac{2}{3}, P(B) = \frac{1}{2}$ and $P(A \cup B) = \frac{5}{6}$, then events A and B are

A. mutually exclusive

B. independent as well as mutually exclusive

C. independent

D. dependent only on A

Answer: C

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59. If $P(A \cap B) = 1/3, P(A \cup B) = 5/6$ and $P(A) = 1/2,$ then which one of the following is correct ?

A. A and B are independent events

B. A and B are mutually exclusive events

C. P(A)=P(B)

D. $P(A) < P(B)$

Answer: A, D

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60. If A and B are independent events of a random experiment such that $P(A \cap B) = \frac{1}{6}$ and $P(\overline{A} \cap \overline{B}) = \frac{1}{3}$ then $P(A) =$

A. $\frac{1}{4}$

B. $\frac{1}{3}$

C. $\frac{1}{6}$

D. $\frac{2}{3}$

Answer: B

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61. If A and B are two independent events such that $P(B) = \frac{2}{7}, , P(A \cup B) = 0.8$ then $P(A) =$

A. 0.1

B. 0.2

C. 0.3

D. 0.4

Answer: C

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62. 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 ? (1) E_1 and E_2 are independent. (2) E_2 and E_3 are independent. (3) E_1 and E_3 are independent. (4) E_1 , E_2 and E_3 are independent.

A. E_1 and E_2 are independent

B. E_2 and E_3 are independent

C. E_1 and E_3 are independent

D. E_1, E_2 and E_3 are independent

Answer: D

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63. Let A and B be two events such that $p(\overline{A} \cup B) = \frac{1}{6}, p(A \cap B) = \frac{1}{4}$ and $p(\overline{A}) = \frac{1}{4}$, where $\overline{A}$ stands for the complement of the event A. Then the events A and B are

A. independent but not equally likely

B. independent and equally likely

C. mutually exclusive and independent

D. equally likely but not independent

Answer: A

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64. A box contains 4 white and 5 black balls. A ball is drawn at random and its colour is noted. A ball is then put back in the box along with two

additional balls of its opposite colour. If a ball is drawn again from the box, then the probability that the ball drawn now is black, is

A. $\frac{7}{11}$

B. $\frac{5}{11}$

C. $\frac{53}{99}$

D. $\frac{48}{99}$

Answer: C

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65. If from each of the three boxes containing 3 white and 1 black, 2 white and 2 black, 1 white and 3 black balls, one ball is drawn at random, then the probability that 2 white and 1 black balls will be drawn, is

A. $\frac{13}{32}$

B. $\frac{1}{4}$

C. $\frac{1}{32}$

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

Answer: A

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66. A bag contains 16 coins of which two are counterfeit with heads on both sides. The rest are fair coins. One is selected at random from the bag and tossed. The probability of getting a head is

A. $9/16$

B. $11/16$

C. $5/9$

D. none of these

Answer: A

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67. A bag contains $n+1$ coins. If is known that one of these coins shows heads on both sides, whereas the other coins are fair. One coin is selected at random and tossed. If the probability that toss results in heads is 7/12, then find the value of n.

A. 3

B. 4

C. 5

D. none of these

Answer: C

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68. A pack of cards consists of 15 cards numbered 1 to 15. Three cards are drawn at random with replacement. Then, the probability of getting 2odd and one even numbered cards is

A. $\frac{348}{1125}$

B. $\frac{398}{1125}$

C. $\frac{448}{1125}$

D. $\frac{498}{1125}$

Answer: C

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69. X speaks truth in 60% and Y in 50% of the cases. Find the probability that they contradict each other narrating the same incident.

A. $\frac{1}{4}$

B. $\frac{1}{4}$

C. $\frac{1}{2}$

D. $\frac{2}{3}$

Answer: C

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70. The chance of defective screws in three boxes $A, B, Care 1/5, 1/6, 1/7,$ respectively. A box is selected at random and a screw draw in from it at random is found to be defective. Then find the probability that it came from box A.

A. $16/29$

B. $1/15$

C. $27/59$

D. $42/107$

Answer: D

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71. In an entrance test, there are multiple choice questions. There are four possible answers to each question, of which one is correct. The probability that a student knows the answer to a question is 90%. If the

gets the correct answer to a question, then find the probability that he was guessing.

A. $\frac{1}{9}$

B. $\frac{36}{37}$

C. $\frac{1}{37}$

D. $\frac{37}{40}$

Answer: C

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72. एक व्यक्ति के बारे में ज्ञात है कि वह 4 में से 3 बार सत्य बोलता है। वह एक पासे को उछालता है और बतलाता है कि उस पर आने वाली संख्या 6 है। इस की प्रायिकता ज्ञात कीजिए कि पासे आने वाली संख्या वास्तव में 6 है।

A. $3/8$

B. $1/5$

C. $3/4$

D. none of these

Answer: A

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Section I - Solved Mcqs

1. 5 persons A, B, C, D and E are in a queue of a shop. The probability that A and E always occur together, is

A. $\frac{1}{4}$

B. $\frac{2}{3}$

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

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

Answer: C

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2. Three houses are available in a locality. Three persons apply for the houses. Each applies for one house without consulting others. The probability that all the three apply for the same house is

A. $\frac{7}{9}$

B. $\frac{8}{9}$

C. $\frac{1}{9}$

D. $\frac{2}{9}$

Answer: C

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3. For a party 7 guests are invited by a husband and his wife. They sit in a row for dinner. The probability that the husband and his wife sit together, is

A. $\frac{2}{7}$

B. $\frac{2}{9}$

C. $\frac{1}{9}$

D. $\frac{4}{9}$

Answer: B

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4. Let $x = 33^n$. The index n is given a positive integral value at random. The probability that the value of x will have 3 in the units place is

A. $\frac{1}{3}$

B. $\frac{1}{4}$

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

D. $\frac{1}{2}$

Answer: B

Watch Video Solution

5. Two integers $xandy$ are chosen with replacement out of the set $\{0, 1, , 2, 3, 10\}$. Then find the probability that $|x - y| > 5$.

A. $\frac{81}{121}$

B. $\frac{30}{121}$

C. $\frac{25}{121}$

D. $\frac{20}{121}$

Answer: B

Watch Video Solution

6. Given that the sum of two non-negative quantities is 200, the probability that their product is not less than $3/4$ times their greatest product value is

A. $7/16$

B. $8/16$

C. $9/16$

D. $10/16$

Answer: B

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7. If three distinct number are chosen randomly from the first 100 natural numbers, then the probability that all three of them are divisible by both 2 and 3 is $4/25$ b. $4/35$ c. $4/33$ d. $4/1155$

A. $\frac{4}{25}$

B. $\frac{4}{35}$

C. $\frac{4}{33}$

D. $\frac{4}{1155}$

Answer: D

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8. A five digit number is formed but the digits 1,2,3,4,5 without repetition. Find the probability that the number is divisible by 4.

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

B. $\frac{18}{5}$

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

D. $\frac{6}{5}$

Answer: C

Watch Video Solution

9. In a party 23 persons take their seats at a round table. The odds against two particular persons sitting together are :

A. $10:1$

B. $1:11$

C. $9:10$

D. none of these

Answer: A

Watch Video Solution

10. If the integers m and n are chosen at random between 1 and 100, then the probability that a number of the form $7^m + 7^n$ is divisible by 5, equals (a) $\frac{1}{4}$ (b) $\frac{1}{7}$ (c) $\frac{1}{8}$ (d) $\frac{1}{49}$

A. $\frac{1}{4}$

B. $\frac{1}{7}$

C. $\frac{1}{8}$

D. $\frac{1}{49}$

Answer: A

Watch Video Solution

11. A committee of five is to be chosen from a group of 9 people. The probability that a certain married couple will either serve together or not at all is

A. $\frac{2}{3}$

B. $\frac{4}{9}$

C. $\frac{1}{2}$

D. $\frac{5}{9}$

Answer: B

Watch Video Solution

12. A five digit number if formed by the digits 1,2,3,4,5,6 and 8. The probability that the number has even digit at both ends is

A. $\frac{3}{7}$

B. $\frac{4}{7}$

C. $\frac{2}{7}$

D. none of these

Answer: C

Watch Video Solution

13. Four digit numbers with different digits are formed using the digits $1, 2, 3, 4, 5, 6, 7, 8$. One number from them is picked up at random. The chance that the selected number contains the digit '1' is

A. $\frac{1}{8}$

B. $\frac{1}{4}$

C. $\frac{1}{2}$

D. none of these

Answer: C

Watch Video Solution

14. If n biscuits are distributed among N beggars, find the chance that a particular beggar will get `r(

A. $.^{n}C_{r}\left(\frac{1}{N}\right)^{r}\left(\frac{N-1}{N}\right)^{n-r}$

B. $\frac{.^{n}C_{r}}{N^{r}}$

C. $.^{n}C_{r}$

D. $\frac{r}{n}$

Answer: A

Watch Video Solution

15. 7 white balls and 3 black balls are kept randomly in order. Find the probability that no two adjacent balls are black.

A. $\frac{1}{2}$

B. $\frac{7}{15}$

C. $\frac{2}{15}$

D. $\frac{1}{3}$

Answer: B

Watch Video Solution

16. Let $x = 33^n$. The index n is given a positive integral value at random.

The probability that the value of x will have 3 in the units place is

A. $\frac{1}{2}$

B. $\frac{1}{3}$

C. $\frac{1}{4}$

D. none of these

Answer: C

Watch Video Solution

17. Number 1, 2, 3, ...100 are written down on each of the cards A, B, and C. One number is selected at random from each of the cards. Then find the probability that the numbers so selected can be the measures (in cm) of three sides of right-angled triangles, no two of which are similar.

A. $\frac{4}{100^3}$

B. $\frac{3}{50^3}$

C. $\frac{3!}{100^3}$

D. none of these

Answer: D

Watch Video Solution

18. Three distinct numbers are chosen at random from the first 15 natural numbers. The probability that the sum will be divisible by 3 is

A. $\frac{30}{91}$

B. $\frac{31}{91}$

C. $\frac{60}{91}$

D. none of these

Answer: B

Watch Video Solution

19. Three persons A, B and C speak at a function along with 5 other persons. If the persons speak at random, find the probability that A speaks before B and B speaks before C

A. $3/8$

B. $1/6$

C. $3/5$

D. none of these

Answer: B

Watch Video Solution

20. A team of 8 couples, (husband and wife) attend a lucky draw in which 4 persons picked up for a prize. Then, inprobability that there is at least one couple is

A. $11/39$

B. $12/39$

C. $14/39$

D. $15/39$

Answer: D

Watch Video Solution

21. $2n$ boys are randomly divided into two subgroups containint n boys each. The probability that eh two tallest boys are in different groups is $n/(2n-1)$ b. $(n-1)/(2n-1)$ c. $(n-1)/4n^2$ d. none of these

A. $\frac{n}{2n-1}$

B. $\frac{n-1}{2n-1}$

C. $\frac{2n-1}{4n^2}$

D. none of these

Answer: A

Watch Video Solution

22. A car is parked by an owner amongst 25 cars in a row, not at either end. On his return he finds that exactly 15 places are still occupied. The probability that both the neighboring places are empty is

A. $\frac{91}{276}$

B. $\frac{15}{184}$

C. $\frac{15}{92}$

D. none of these

Answer: C

Watch Video Solution

23. There is a five-volume dictionary among 50 books arranged on a shelf in a random order. If the volumes are not necessarily kept side-by side, the probability that they occur in increasing order from left to right is

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

B. $\frac{1}{5^{50}}$

C. $\frac{1}{50^5}$

D. none of these

Answer: D

Watch Video Solution

24. If 10 objects are distributed at random among 10 persons, then find the probability that at least one of them will not get anything.

A. $\frac{10^{10}-10}{10^{10}}$

B. $\frac{10^{10}-10!}{10^{10}}$

C. $\frac{10^{10}-1}{10^{10}}$

D. none of these

Answer: B

Watch Video Solution

25. The numbers 1, 2, 3, ..., n are arrange in a random order. The probability that the digits 1, 2, 3, .., `k(k

A. $\frac{1}{n!}$

B. $\frac{k!}{n!}$

C. $\frac{(n-k)!}{n!}$

D. none of these

Answer: D

Watch Video Solution

26. The numbers 1,2,3,.., n are arranged in a random order. The probability that the digits $1, 2, 3, \ldots, k (n > k)$ appears as neighbours in that order is

A. $\frac{(n-k)!}{n!}$

B. $\frac{n-k+1}{.^{n}C_{k}}$

C. $\frac{n-k}{.^{n}C_{k}}$

D. $\frac{k!}{n!}$

Answer: B

Watch Video Solution

27. 10 mangoes are to be distributed among 5 persons. The probability that at least one of them will receive none, is

A. $\frac{35}{143}$

B. $\frac{108}{143}$

C. $\frac{18}{143}$

D. $\frac{125}{143}$

Answer: D

Watch Video Solution

28. There are four machines and it is known that eactly two of them are faulty. They are tested, one by one, in a random order till both the faulty machines are identified. The probability that only two tests are needed is

(A) $\frac{1}{6}$ (B) $\frac{1}{3}$ (C) $\frac{1}{2}$ (D) $\frac{1}{4}$

A. $1/3$

B. $1/6$

C. $1/2$

D. $1/4$

Answer: B

Watch Video Solution

29. In a convex hexagon two diagonals are drawn at random. The probability that the diagonals intersect at an interior point of the hexagon is

A. $5/12$

B. $7/12$

C. $2/5$

D. none of these

Answer: A

Watch Video Solution

30. Fifteen persons, among whom are A and B, sit down at random on a round table. The probability that there are 4 persons between A and B, is

A. $\frac{9!}{14!}$

B. $\frac{10!}{14!}$

C. $\frac{9!}{15!}$

D. none of these

Answer: D

Watch Video Solution

31. A and B play a game where each is asked to select a number from 1 to 25. If the two numbers match, both of them wins a prize.The probability

that they will not win a prize in a single trial is

A. $1/25$

B. $24/25$

C. $2/25$

D. none of these

Answer: B

Watch Video Solution

32. Three identical dice are rolled. The probability that same number appears on them, is

A. $\frac{1}{6}$

B. $\frac{1}{36}$

C. $\frac{1}{18}$

D. $\frac{3}{28}$

Answer: B

Watch Video Solution

33. Three identical dice are thrown together. Find the probability that distinct numbers appear on them.

A. $\frac{4}{9}$

B. $\frac{5}{9}$

C. $\frac{5}{39}$

D. $\frac{1}{9}$

Answer: B

Watch Video Solution

34. Three dice are thrown together. The probability that the sum of the numbers appearing on them is 9, is

A. $\frac{7}{216}$

B. $\frac{47}{54}$

C. $\frac{7}{54}$

D. $\frac{7}{9}$

Answer: C

Watch Video Solution

35. If four dice are thrown together. Probability that the sum of the number appearing on them is 13, is

A. $\frac{35}{324}$

B. $\frac{5}{216}$

C. $\frac{11}{216}$

D. $\frac{11}{432}$

Answer: A

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36. Four tickets are marked 00, 01, 10 and 11 respectively, are placed in a bag. A ticket is drawn at random five times, being replaced each time. The probability that the sum of the numbers on the five tickets drawn is 24, is

A. $\frac{25}{256}$

B. $\frac{25}{512}$

C. $\frac{25}{1024}$

D. $\frac{25}{128}$

Answer: B

Watch Video Solution

37. Three six-faced dice are thrown together. The probability that the sum of the numbers appearing on the dice is $k(3 \leq k \leq 8)$, is

A. $\frac{k^2}{432}$

B. $\frac{k(k-1)}{432}$

C. $\frac{(k-1)(k-2)}{432}$

D. $\frac{k(k-1)(k-2)}{432}$

Answer: C

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38. Three six-faced dice are thrown together. The probability that the sum of the numbers appearing on the dice is $k(9 \leq k \leq 14)$, is

A. $\frac{21k - k^2 - 83}{216}$

B. $\frac{k^2 - 3k + 2}{432}$

C. $\frac{21k - k^2 - 83}{432}$

D. none of these

Answer: A

Watch Video Solution

39. Let ω be a complex cube root unity with $\omega \neq 1$. A fair die is thrown three times. If $r_1, r_2 and r_3$ are the numbers obtained on the die, then the probability that $\omega^{r1} + \omega^{r2} + \omega^{r3} = 0$ is $1/18$ b. $1/9$ c. $2/9$ d. $1/36$

A. $\frac{1}{18}$

B. $\frac{1}{9}$

C. $\frac{2}{9}$

D. $\frac{1}{36}$

Answer: C

Watch Video Solution

40. Six faces of a die are marked with numbers $1, -1, 0, -2, 2, 3$ and the die is thrown thrice. The probability that the sum of the numbers thrown is six, is

A. $\frac{1}{72}$

B. $\frac{1}{12}$

C. $\frac{5}{108}$

D. $\frac{1}{36}$

Answer: C

Watch Video Solution

41. Three dice are thrown. The probability of getting a sum which is a perfect square, is

A. $2/5$

B. $9/20$

C. $1/4$

D. none of these

Answer: D

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42. A is a set containing n elements. A subset P of A is chosen at random. The set A is reconstructed by replacing the elements of P. A subset Q is again chosen at random. The probability that P and Q are disjoint sets, is

A. $\left(\frac{1}{2}\right)^n$

B. $\left(\frac{1}{4}\right)^n$

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

D. $\left(\frac{3}{4}\right)^n$

Answer: D

Watch Video Solution

43. A is a set containing n elements. A subset P of A is chosen at random. The set A is reconstructed by replacing the elements of P. A subset Q is again chosen at random. The probability that P =Q, is

A. $\frac{1}{2^n}$

B. $\left(\frac{3}{4}\right)^n$

C. $\left(\frac{1}{4}\right)^n$

D. $\left(\frac{2}{3}\right)^n$

Answer: A

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44. A is a set containing n elements. A subset P of A is chosen at random. The set A is reconstructed by replacing the elements of P. A subset Q is again chosen at random. The Probability that $P \cup Q = A$, is

A. $\frac{1}{2^n}$

B. $\left(\frac{3}{4}\right)^n$

C. $n\left(\frac{3}{4}\right)^n$

D. $\frac{n}{3}\left(\frac{3}{4}\right)^n$

Answer: D

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45. A is a set containing n elements. A subset P of A is chosen at random. The set A is reconstructed by replacing the elements of P. A subset Q is again chosen at random. The Probability that $P \cap Q$ contain just one element, is

A. $\left(\frac{3}{4}\right)^n$

B. $n\left(\frac{3}{4}\right)^n$

C. $\frac{n}{3}\left(\frac{3}{4}\right)^n$

D. $\frac{n}{4}\left(\frac{3}{4}\right)^n$

Answer: C

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46. A is a set containing n elements. A subset P of A is chosen at random. The set A is reconstructed by replacing the elements of P. A subset Q is again chosen at random. The Probability that $P \cup Q$ contain just one element, is

A. $\frac{3}{4^n}$

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

C. $n\left(\frac{3}{4}\right)^n$

D. $\frac{n}{4^n}$

Answer: B

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47. A is a set containing n elements. A subset P of A is chosen at random. The set A is reconstructed by replacing the elements of P. A subset Q is again chosen at random. The Probability that Q is a subset of P, is

A. $\frac{3}{4^n}$

B. $\left(\frac{3}{4}\right)^n$

C. $n\left(\frac{3}{4}\right)^n$

D. $\frac{3n}{4^n}$

Answer: B

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48. A is a set containing n elements. A subset P of A is chosen at random. The set A is reconstructed by replacing the elements of P. A subset Q is again chosen at random. The Probability that P and Q have equal number of elements, is

A. $\left(\frac{3}{4}\right)^n$

B. $\frac{.^{2n}C_n}{4^n}$

C. $\frac{.^{2n}C_{n-1}}{4^n}$

D. $\frac{n^2}{4^n}$

Answer: B

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49. A is a set containing n elements. A subset P of A is chosen at random. The set A is reconstructed by replacing the elements of P. A subset Q is again chosen at random. The probability that Q contains just one element more than P, is

A. $\frac{{}^{2n}C_n}{4^n}$

B. $\frac{2n}{4^n}$

C. $\frac{{}^{2n-1}C_n}{4^n}$

D. $\frac{{}^{2n}C_{n-1}}{4^n}$

Answer: D

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50. Let A be a set containing elements. A subset P of the set A is chosen at random. The set A is reconstructed by replacing the elements of P, and another subset Q of A is chosen at random. The probability that $P \cap Q$ contains exactly $m(m < n)$ elements, is

A. $\frac{3^{n-m}}{4^n}$

B. $\frac{.^n C_m \times 3^m}{4^n}$

C. $\frac{.^n C_m \times 3^{n-m}}{4^n}$

D. none of these

Answer: C

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51. A subset A of the set X={1,2,3,..,100} is chosen at random. The set X is reconstructed by replacing the elements of A, and another subset B of X is chosen at random. The probability that $A \cap B$ contains exactly 10 elements, is

A. $.^{100}C_{10}\left(\frac{3}{4}\right)^{90}$

B. $.^{100}C_{10}\left(\frac{1}{2}\right)^{100}$

C. $.^{100}C_{10}\times\frac{3^{90}}{4^{100}}$

D. none of these

Answer: C

Watch Video Solution

52. Let A be a set consisting of n elements. The probability of selecting two subsets P and Q of set A such that $Q=\overline{P}$, is

A. $\frac{1}{2}$

B. $\frac{1}{2^n-1}$

C. $\frac{1}{2^n}$

D. $\frac{1}{3^n}$

Answer: B

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53. Four numbers are multiplied together. Then the probability that the product will be divisible by 5 or 10 is $369/625$ b. $399/625$ c. $123/625$ d. none of these

A. $\frac{369}{625}$

B. $\frac{399}{625}$

C. $\frac{123}{625}$

D. $\frac{133}{625}$

Answer: A

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54. If $\overline{E}$ and $\overline{F}$ are the complementary events of E and F respectively and if $0 < P(F) < 1$, then

A. $P(E/F) + P\left(\overline{E}/F\right) = 1$

B. $P(E/F) + P\left(E/\overline{F}\right) = 1$

C. $P\left(\overline{E}/F\right) + P\left(E/\overline{F}\right) = 1$

D. $P\left(E/\overline{F}\right) + P\left(\overline{E}/\overline{F}\right) = 1$

Answer: A::D

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55. If A and B are two mutually exclusive events, then the relation between $P\left(\overline{A}\right)$ and $P(B)$ is

A. $P(A) \leq P\left(\overline{B}\right)$

B. $P(A) > P\left(\overline{B}\right)$

C. $P(A) < P(B)$

D. none of these

Answer: A

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56. If A and B are two events, the probability that at most one of these events occurs is

A. $1 - P(A \cap B)$

B. $P(\overline{A}) + P(\overline{B}) - P(\overline{A} \cap \overline{B})$

C. $P(\overline{A}) + P(\overline{B}) + P(A \cup B) - 1$

D. all the above

Answer: D

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57. The probability of the simultaneous occurrence of two events A and B is p. If the probability that exactly one of A, B occurs is q, then which of the following alternatives is incorrect ?

A. $P(\overline{A}) + P(\overline{B}) = 2 + 2q - p$

B. $P(\overline{A}) + P(\overline{B}) = 2 - 2p - q$

C. $P(A \cap B / A \cup B) = \frac{p}{p+q}$

D. $P(\overline{A} \cap \overline{B}) = 1 - p - q$

Answer: A

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58. If M and N are any two events, then the probability that exactly one of them occurs is

A. $P(A) + P(B) - 2p(A \cap B)$

B. $P(A \cap \overline{B}) + P(\overline{A} \cap B)$

C. $P(A \cap B) - P(A \cap B)$

D. $P(\overline{A}) + P(\overline{B}) - 2P(\overline{A} \cap \overline{B})$

Answer: D

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59. If A, B and C are three events, then which of the following is incorrect ?

A. P(Exatly two of A, B, C occur)

$\leq P(A \cap B) + P(B \cap C) + P(C \cap A)$

B. $P(A \cup B \cup C) \leq P(A) + P(B) + P(C)$

C. P(Exactly one of A, B, C occur)

$\leq P(A) + P(B) + P(C) - P(B \cap C) - P(C \cap A) - P(A \cap B)$

D. P(A and at least one of B c, occurs) $\geq P(A \cap B) + P(A \cap C)$

Answer: D

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60. If A and B are two events such that $P(A) = \frac{1}{2}$ and $P(B) = \frac{2}{3}$, then which of the following is incorrect ?

A. $P(A \cap B) \geq \frac{2}{3}$

B. $P\left(A \cap \overline{B}\right) + \geq \frac{1}{3}$

C. $\frac{1}{6} \leq P(A \cap B) \leq \frac{1}{2}$

D. $\frac{1}{6} \leq P\left(\overline{A} \cap B\right) \leq \frac{1}{2}$

Answer: B

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61. If $P(A) = 3/5$ and $P(B) = 2/3$, then which of the following alternatives is incorrect ?

A. $P(A \cup B) \geq 2/3$

B. $4/15 \leq P(A \cap B) \leq 3/5$

C. $2/5 \leq P(A/B) \leq 9/10$

D. $P\left(A \cap \overline{B}\right) \geq 1/3$

Answer: D

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62. A and B are two events such that odds odds against A are 2 : 1 odds in favour of $A \cup B$ are 3 : 1. If $x \leq P(B) \leq y$, then the ordered pair (x, y) is

A. $(5/12, 3/4)$

B. $(2/3, 3/4)$

C. $(1/3, 3/4)$

D. none of these

Answer: A

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63. The probabilities that a student passes in Mathematics,Physics and Chemistry are m, p and c, respectively. Of these subjects, the student has a 75% chance of passing in at least one, a 50% chance of passing in at

least two and a 40% chance of passing in exactly two. Which of the following relations are true?

A. $p + m + c = \frac{19}{20}$

B. $p + m + c = \frac{27}{20}$

C. $\pm c = \frac{1}{10}$

D. $\pm c = \frac{1}{4}$

Answer: A::B::C::D

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64. If $P(A \cap B) = \frac{1}{2}, P(\overline{A} \cap \overline{B}) = \frac{1}{2}$ and 2P(A)=P(B)=p, then the value of p is equal to

A. $\frac{1}{2}$

B. $\frac{2}{3}$

C. $\frac{1}{4}$

D. $\frac{1}{3}$

Answer: B

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65. If $\frac{(1-3p)}{2}, \frac{(1+4p)}{3}, \frac{(1+p)}{6}$ are the probabilities of three mutually excusing and exhaustive events, then the set of all values of p is

a. (0,1) b. (-1/4,1/3) c. (0,1/3) d.

A. (0, 1)

B. $[-1/4, 1/3]$

C. $(0, 1/3)$

D. $(0, \propto)$

Answer: B

Watch Video Solution

66. Events A, B, C are mutually exclusive events such that $P(A) = \frac{3x+1}{3}, P(B) = \frac{1-x}{4}$ and $P(C) = \frac{1-2x}{2}$. The set of all possible values of x are in the interval

A. [0, 1]

B. $[-1/3, 1/2]$

C. $[1/3, 2/3]$

D. $[1/3, 13/3]$

Answer: B

Watch Video Solution

67. If $0 < P(A) < 1, 0 < P(B) < 1$ and $P(A \cup B) = P(A) + P(B) - P(A)P(B)$, then

A. $P(A/B) = P(A) + P(B)$

B. $P(A \cup B)^c = P(A^c)P(B^c)$

C. $P(A^c - B^c) = P(A^c)P(B^c)$

D. $P(B/A) = P(B) - P(A)$

Answer: B

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68. For two events A and B, if $P(A)P\left(\frac{A}{B}\right) = \frac{1}{4}$ and $P\left(\frac{B}{A}\right) = \frac{1}{2}$, then which of the following is not true ?

A. A and B are mutually exclusive events

B. A and B are independent events such that $P\left(\overline{A}/B\right) = 3/4$

C. A and B are independent events such that $P\left(\overline{A}/B\right) = 1/2$

D. A and B are in independent events such that $P\left(\overline{A}/B\right) = 3/4$

Answer: B

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69. If A and B are two independent events such that $P(A) = \frac{1}{2}$ and $P(B) = \frac{1}{5}$, then which of the following is incorrect ?

A. $P(A \cup B) = 3/5$

B. $P(A/B) = 1/2$

C. $P(A/A \cup B) = 5/6$

D. $P\left(A \cap B/\overline{A} \cup \overline{B}\right) = 1/2$

Answer: D

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70. If the independent events A and B are such that $0 < P(A) < 1$ and $P(B) < 1$, then which of the following alternatives is not correct ?

A. A and B are mutually exclusive

B. A and $\overline{B}$ are independent

C. $\overline{A}$ and $\overline{B}$ are independent

D. $P(A/B) + P\left(\overline{A}/B\right) = 1.$

Answer: A

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71. If A and B are two independent events such that $P\left(\overline{A} \cap B\right) = 2/15$ and $P\left(A \cap \overline{B}\right) = 1/6$, then P(B), is

A. $\frac{1}{5}$ or , $\frac{4}{5}$

B. $\frac{1}{6}$ or, $\frac{5}{6}$

C. $\frac{4}{5}$ or, $\frac{1}{6}$

D. $\frac{5}{6}$ or, $\frac{1}{5}$

Answer: C

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72. If A and B are two independent events such that $P(\overline{A}) = \frac{7}{10}, P(\overline{B}) = \alpha$ and $P(A \cup B) = \frac{8}{10}$, then α, is

A. $2/7$

B. $5/7$

C. 1

D. none of these

Answer: A

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73. A and B throw a dice. The probability that A's throw is not greater than B's, is

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

B. $\frac{7}{12}$

C. $\frac{1}{6}$

D. $\frac{1}{2}$

Answer: B

Watch Video Solution

74. If $P(A) = \frac{1}{4}, P(\overline{B}) = \frac{1}{2}$ and $P(A \cup B) = \frac{5}{9}$, then $P(A/B)$ is

A. $\frac{7}{36}$

B. $\frac{7}{9}$

C. $\frac{7}{18}$

D. $\frac{7}{72}$

Answer: C

Watch Video Solution

75. A person draws a card from a well shuffled pack of 52 playing cards. Replaces it and shuffles the pack. He continues doing so until he draws as pade. The chance that he fails first two times is

A. $\frac{1}{16}$

B. $\frac{9}{16}$

C. $\frac{9}{64}$

D. $\frac{1}{64}$

Answer: B

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76. Four positive integers are taken at random and are multiplied together. Then the probability that the product ends in an odd digit than 5 is

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

B. $\frac{609}{625}$

C. $\frac{16}{625}$

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

Answer: C

Watch Video Solution

77. A fair coin is tossed repeatedly. The probability of getting a result in fifth toss different from those obtained in the first four tosses is

A. $\frac{1}{2}$

B. $\frac{1}{32}$

C. $\frac{31}{32}$

D. $\frac{1}{16}$

Answer: D

Watch Video Solution

78. Cards are drawn one by one without replacement from a pack of 52 cards. The probability of the 11th card drawn is first ace,is:

A. $\frac{451}{884}$

B. $\frac{241}{1456}$

C. $\frac{164}{4165}$

D. none of these

Answer: C

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79. A man draws a card from a pack of 52 cards and then replaces it. After shuffling the pack, he again draws a card. This he repeats a number of times. The probability that he will draw a heart for the first time in the third draw is

A. $\frac{9}{64}$

B. $\frac{27}{64}$

C. $\frac{1}{4} \times \frac{.^{39}C_2}{.^{52}C_2}$

D. none of these

Answer: A

Watch Video Solution

80. Two numbers are selected randomly from the set $S = \{1, 2, 3, 4, 5, 6\}$ without replacement one by one. The probability that minimum of the two numbers is less than 4 is $1/15$ b. $14/15$ c. $1/5$ d. $4/5$

A. $\frac{1}{15}$

B. $\frac{14}{15}$

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

D. $\frac{4}{5}$

Answer: D

Watch Video Solution

81. It has been found that if A and B play a game 12 times, A wins 6 times, B wins 4 times and they draw twice. A and B take part in a series of 3 games. The probability that they will win alternately is

A. $\frac{5}{72}$

B. $\frac{5}{36}$

C. $\frac{19}{27}$

D. none of these

Answer: B

Watch Video Solution

82. A person draws 2 cards from a well shuffled pack of cards, the cards are replaced after noting their colour. Then another person draws 2 cards after shuffling the pack. The probability that there will be exactly 1 common card is

A. $\frac{25}{546}$

B. $\frac{50}{663}$

C. $\frac{25}{663}$

D. none of these

Answer: B

Watch Video Solution

83. All the heart cards are taken out from a pack of playing cards. From these cards, cards are drawn one by one without replacement till the ace of hearts comes. The probability that ace comes in the 4th draw is

A. $\frac{1}{13}$

B. $\frac{12}{13}$

C. $\frac{4}{13}$

D. none of these

Answer: A

Watch Video Solution

84. A and B are two events such that $P(A \cup B) = \frac{3}{4}, P(A) = \frac{1}{3}, P(\overline{A} \cap B) =$

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

B. $\frac{3}{8}$

C. $\frac{5}{8}$

D. $\frac{1}{4}$

Answer: A

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85. A problem in mathematics is given to three students A, B, C and their respective probability of solving the problem is 1/2, 1/3 and 1/4. Probability that the problem is solved is $3/4$ b. $1/2$ c. $2/3$ d. $1/3$

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

B. $\frac{1}{2}$

C. $\frac{2}{3}$

D. $\frac{1}{3}$

Answer: A

Watch Video Solution

86. A bag contains 5 apples and 7 oranges and another basket contains 4 apples and 8 oranges. One fruit is picked out from each basket. Find the probability that the fruits are both apples or both oranges.

A. $\frac{24}{144}$

B. $\frac{56}{144}$

C. $\frac{68}{144}$

D. $\frac{76}{144}$

Answer: C

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87. The probability of happening of an event A is 0.5 and that of B is 0.3. If A and B are mutually exclusive events, then the probability of neither A nor B is.....

A. 0.6

B. 0.5

C. 0.7

D. none of these

Answer: D

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88. If P(B) $= \frac{3}{4}$ P(A cap B cap overset(-)(c))=(1)/(3) and P(overset(" "-)(A) cap B cap overset(-)(C))=(1)/(3), $then$P(B cap C)` is equal to

A. $\frac{1}{2}$

B. $\frac{1}{6}$

C. $\frac{1}{15}$

D. $\frac{1}{9}$

Answer: A

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89. Five horses are in a race. Mr. A selects two of the horses at random and bets on them. The probability that Mr. A selected the winning horse

is

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

B. $\frac{4}{5}$

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

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

Answer: A

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90. The probability that A speaks truth is $\frac{4}{5}$, while this probability for B is $\frac{3}{4}$. The probability that they contradict each other when asked to speak on a fact is

A. $\frac{4}{5}$

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

C. $\frac{7}{20}$

D. $\frac{3}{20}$

Answer: C

Watch Video Solution

91. The probability that in a year of $22nd$ centurychosen at random, there will be 53 Sundays is

A. $\frac{3}{28}$

B. $\frac{2}{28}$

C. $\frac{7}{28}$

D. $\frac{5}{28}$

Answer: D

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92. For two events A and B, if $P(A)P\left(\frac{A}{B}\right) = \frac{1}{4}$ and $P\left(\frac{B}{A}\right) = \frac{1}{2}$, then which of the following is not true ?

A. A and B are independent events

B. $P(A'/B) = \frac{3}{4}$

C. $P(B'/A) = \frac{1}{2}$

D. all of the above

Answer: D

Watch Video Solution

93. A dice is thrown. The probability that the first time 1 occurs at the even throw is

A. $\frac{1}{6}$

B. $\frac{5}{11}$

C. $\frac{6}{11}$

D. $\frac{5}{36}$

Answer: B

Watch Video Solution

94. There are n urns each containing (n+1) balls such that the i^{th} urn contains ' I' white balls and (n+1-i) red balls. Let U_i be the event of selecting i^{th} urn, i=1,2,3,.., n and W denotes the event of getting a white ball. If $P(U_i) \propto$ i, where i=1,2,3,..,n, then $\lim_{n \to \infty} P(W)$ is equal to

A. 1

B. $\frac{2}{3}$

C. $\frac{1}{4}$

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

Answer: B

Watch Video Solution

95. There are n urns each containing (n+1) balls such that the i^{th} urn contains ' I' white balls and (n+1-i) red balls. Let U_i be the event of selecting i^{th} urn, i=1,2,3,.., n and W denotes the event of getting a white ball. if $P(U_i) = C$, where C is a constant, then $P(U_n/W)$ is equal to

A. $\frac{2}{n+1}$

B. $\frac{1}{n+1}$

C. $\frac{n}{n+1}$

D. $\frac{1}{2}$

Answer: A

View Text Solution

96. There are n urns each containing (n+1) balls such that the i^{th} urn contains ' I' white balls and (n+1-i) red balls. Let U_i be the event of selecting i^{th} urn, i=1,2,3,.., n and W denotes the event of getting a white

ball. if n is even and E denotes the event of choosing even numbered urn $\left(p(U_i) = \frac{1}{n}\right)$, then the value of $P(W/E)$, is

A. $\frac{n+2}{2n+1}$

B. $\frac{n+2}{2(n+1)}$

C. $\frac{n}{n+1}$

D. $\frac{1}{n+1}$

Answer: B

View Text Solution

97. One Indian and four American men and their wives are to be seated randomly around a circular table. Then the conditional probability that the Indian man is seated adjacent to his wife given that each American man is seated adjacent to his wife is

A. $\frac{1}{2}$

B. $\frac{1}{3}$

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

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

Answer: C

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98. An experiment has 10 equally likely outcomes. Let A and B be two non-empty events of the experiment. If A consists of 4 outcomes, the number of outcomes that B must have so that A and B are independent, is (A) 2, 4 or 8 (B) 3, 6 or 9

A. 2,4 or 8

B. 3,6, or 9

C. 4 or 8

D. 5 or 10.

Answer: D

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99. A fair die is tossed repeatedly until a six is obtained Let X denote the number of tosses required The probability that $X = 3$ equals

A. $\frac{25}{216}$

B. $\frac{25}{36}$

C. $\frac{5}{36}$

D. $\frac{125}{216}$

Answer: A

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100. A fair die is tossed repeatedly until a six is obtained Let X denote the number of tosses required . the probability that $X \geq 3$ equals

A. $\frac{125}{216}$

B. $\frac{25}{36}$

C. $\frac{5}{36}$

D. $\frac{25}{216}$

Answer: B

View Text Solution

101. A fair die is tossed repeatedly until a six is obtained Let X denote the number of tosses required The conditional probability that $X > 6$ given $x > 3$ equals

A. $\frac{125}{216}$

B. $\frac{25}{216}$

C. $\frac{5}{36}$

D. $\frac{25}{36}$

Answer: D

View Text Solution

102. If A and B are mutually exclusive events with $P(B) \neq 1$, then $P\left(A / \overline{B}\right)$=

A. $\frac{1}{P(B)}$

B. $\frac{1}{1-P(B)}$

C. $\frac{P(A)}{P(B)}$

D. $\frac{P(A)}{1-P(B)}$

Answer: D

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103. Let E^c denote the complement of an event E. Let E, F, G be pairwise independent events with $P(G) > 0$ and $P(E \cap F \cap G) = 0$ Then $P(E^c \cap F^c \cap G)$ equals (A) $P(E^c) + P(F^c)$ (B) $P(E^c) - P(F^c)$ (C) $P(E^c) - P(F)$ (D) $P(E) - P(F^c)$

A. $P(E') + P(F')$

B. $P(E') - P(F')$

C. $P(E') - P(F)$

D. $P(E) - P(F')$

Answer: C

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104. A signal which can be green or red with probability $\frac{4}{5}$ and $\frac{1}{5}$ respectively, is received by station A and then and 3 transmitted to station B. The probability of each station receiving the signal correctly is $\frac{3}{4}$ If the signal received at station B is green, then the probability that the original signal was green is (a) $\frac{3}{5}$ (b) $\frac{6}{7}$ (d) $\frac{20}{23}$ (d) $\frac{9}{20}$

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

B. $\frac{6}{7}$

C. $\frac{20}{23}$

D. $\frac{9}{20}$

Answer: C

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105. An unbiased die is rolled untill two consecutive trials result in even numbered faces. The probability that exactly six trials are required to get consecutive even numbered faces, is

A. $5\left(\frac{1}{6}\right)^6$

B. $6\left(\frac{1}{2}\right)^6$

C. $4\left(\frac{1}{2}\right)^6$

D. $\left(\frac{1}{6}\right)^6$

Answer: A

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106. An urn contains nine balls of which three are red, four are blue and two are green. Three balls are drawn at random without replacement from the urn. The probability that the three balls have different colour is (1) $\frac{2}{7}$ (2) $\frac{1}{21}$ (3) $\frac{2}{23}$ (4) $\frac{1}{3}$

A. $1/2$

B. $2/23$

C. $1/3$

D. $2/7$

Answer: D

Watch Video Solution

107. Let $EandF$ be tow independent events. The probability that exactly one of them occurs is 11/25 and the probability if none of them occurring is 2/25. If $P(T)$ deontes the probability of occurrence of the event T, then $P(E) = \frac{4}{5}, P(F) = \frac{3}{5}$ $P(E) = \frac{1}{5}, P(F) = \frac{2}{5}$ $P(E) = \frac{2}{5}, P(F) = \frac{1}{5}$ $P(E) = \frac{3}{5}, P(F) = \frac{4}{5}$

A. $P(E) = \frac{4}{5}, P(F) = \frac{3}{5}$

B. $P(E) = \frac{1}{5}, P(F) = \frac{2}{5}$

C. $P(E) = \frac{2}{5}, P(F) = \frac{1}{5}$

D. $P(E) = \frac{6}{5}, P(F) = \frac{1}{5}$

Answer: A

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108. Let U_1 , and U_2, be two urns such that U_1, contains 3 white and 2 red balls, and U_2, contains only1 white ball. A fair coin is tossed. If head appears then 1 ball is drawn at random from U_1, and put into U_2, . However, if tail appears then 2 balls are drawn at random from U_1, and put into U_2.. Now 1 ball is drawn at random from U_2, .61 . The probability of the drawn ball from U_2, being white is

A. $\frac{13}{30}$

B. $\frac{23}{30}$

C. $\frac{19}{30}$

D. $\frac{11}{30}$

Answer: D

Watch Video Solution

109. Let U_1 , and U_2, be two urns such that U_1, contains 3 white and 2 red balls, and U_2, contains only1 white ball. A fair coin is tossed. If head appears then 1 ball is drawn at random from U_1, and put into U_2, . However, if tail appears then 2 balls are drawn at random from U_1, and put into U_2. . Now 1 ball is drawn at random from U_2, . given that the ball drawn from U_2 is white, the probability that head appeared on the coin is

A. $\frac{17}{23}$

B. $\frac{11}{23}$

C. $\frac{15}{23}$

D. $\frac{12}{23}$

Answer: D

View Text Solution

110. If C and D are two events such that $C \subset DandP(D) \neq 0$, then the correct statement among the following is : (1) $P(C \mid D) = P(C)$ (2) $P(C \mid D) \geq P(C)$ (3) $P(C \mid D) < P(C)$ (4) $P(C \mid D) = \left(P\frac{D}{P(C)}\right.$

A. $P(C/D) = P(C)$

B. $P(C/D) \geq P(C)$

C. $P(C/D) < P(C)$

D. $P(C/D) = \frac{P(D)}{P(C)}$

Answer: D

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111. Let A, B, C be pariwise independent events with $P(C) > 0$ and $P(A \cap B \cap C) = 0$. Then $P\left(A^c \cap \frac{B^c}{C}\right)$.

A. $P(A^c) + P(B^c)$

B. $P(A^c) - P(B^c)$

C. $P(A^c) - P(B)$

D. $P(A) - P(B^c)$

Answer: C

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112. four fair dice D_1, D_2, D_3 and D_4 each having six faces numbered 1,2,3,4,5 and 6 are rolled simultaneously. The probability that D_4 shows a number appearing on one of D_1, D_2, D_3 is

A. $\frac{91}{216}$

B. $\frac{108}{216}$

C. $\frac{125}{216}$

D. $\frac{127}{216}$

Answer: A

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113. A ship is fitted with three engines E_1, E_2, and E_3,. The engines function independently of each other with respective probabilities $\frac{1}{2}$. $\frac{1}{4}$ and $\frac{1}{4}$,and For the ship to be operational at least two of its engines must function. Let X denote the event that the ship is operational and let X_1, X_2, and X_3 denote respectively the events that the engines E_1, E_2 and E_3,are functioning. Which of the following is (are) true?

A. $P\left(X_1^c / X\right) = \frac{7}{8}$

B. P [Exactly two engines of the ship are functioning X] $= \frac{7}{8}$

C. $P(X / X_2) = \frac{5}{16}$

D. $P(X / X_1) = \frac{7}{16}$

Answer: C

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114. If X and Y are two events such that $PX/Y\Big) = \frac{1}{2}, P(Y/X) = \frac{1}{3}$ and $P(X \cap Y)\frac{1}{6}$. Then, which of the following is/are correct ?

A. $P(X \cup Y) = \frac{2}{3}$

B. X and Y are independent

C. $P(X^c \cap Y) = \frac{1}{6}$

D. X and Y are not independent

Answer: D

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115. The probability that randomly selected calculator from a store is of brand r is proportional to r, r=1,2,..,6. Further, the probability of a calucltor

of brand r being defective is $\frac{7-r}{21}, r = 1, 2, . . , 6$. Then the probability that a calculator randomly selected from the store being defective is

A. $\frac{8}{63}$

B. $\frac{13}{63}$

C. $\frac{55}{63}$

D. $\frac{50}{63}$

Answer: A

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116. Four person independently solve a certain problem correctly with probabilities $\frac{1}{2}, \frac{3}{4}, \frac{1}{4}, \frac{1}{8}$. Then the probability that he problem is solve correctly by at least one of them is $\frac{235}{256}$ b. $\frac{21}{256}$ c. $\frac{3}{256}$ d. $\frac{253}{256}$

A. $\frac{235}{256}$

B. $\frac{21}{256}$

C. $\frac{3}{256}$

D. $\frac{253}{256}$

Answer: A

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117. A box B_1, contains 1 white ball, 3 red balls and 2 black balls. Another box B_2, contains 2 white balls, 3 red balls and 4 black balls. A third box B_3 , contains 3 white balls, 4 red balls and 5 black balls.

A. $\frac{82}{648}$

B. $\frac{90}{648}$

C. $\frac{558}{648}$

D. $\frac{566}{648}$

Answer: A

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118. A box B_1, contains 1 white ball, 3 red balls and 2 black balls. Another box B_2, contains 2 white balls, 3 red balls and 4 black balls. A third box B_3 , contains 3 white balls, 4 red balls and 5 black balls.

A. $\frac{116}{181}$

B. $\frac{126}{181}$

C. $\frac{65}{181}$

D. $\frac{55}{181}$

Answer: D

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119. Of the three independent event E_1, E_2 and E_3, the probability that only E_1 occurs is α, only E_2 occurs is β and only E_3 occurs is γ. If the probavvility p that none of events E_1, E_2 or E_3 occurs satisfy the equations $(\alpha - 2\beta)p = \alpha\beta$ and $(\beta - 3\gamma)p = 2\beta\gamma$. All the given probabilities are assumed to lie in the interval (0, 1). Then, $\frac{\text{probability of occurrence of } E_1}{\text{probability of occurrence of } E_3}$ is equal to

A. 3

B. 2

C. 6

D. 4

Answer: C

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120. A biased coin with probability p, $0 < p < 1$ of heads is tossed until a head appears for the first time. If the probability that the number of tosses required is even is 2/5, then p equals

A. $2/3$

B. $1/2$

C. $1/3$

D. $1/4$

Answer: C

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121. The minimum number of times a fair coin needs to be tossed, so that the probability of getting at least two heads is at least 0.96 is :

A. 7

B. 9

C. 8

D. 5

Answer: C

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122. Let $n_1,$ and n_2, be the number of red and black balls, respectively, in box I. Let n_3 and n_4,be the number one red and b of red and black balls,

respectively, in box II. One of the two boxes, box I and box II, was selected at random and a ball was drawn randomly out of this box. The ball was found to be red. If the probablity that this red ball was drawn from box II is $\frac{1}{3}$ then the correct option(s) with the possible values of $n_1, n_2, n_3, \text{ and } n_4$, is(are)

A. $n_1 = 3, n_2 = 3, n_3 = 5, n_4 = 15$

B. $n_1 = 3, n_2 = 6, n_3 = 10, n_4 = 50$

C. $n_1 = 8, n_2 = 6, n_3 = 5, n_4 = 20$

D. $n_1 = 6, n_2 = 12, n_3 = 5, n_4 = 20$

Answer: A::B

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123. Let $n_1, \text{ and } n_2$, be the number of red and black balls, respectively, in box I. Let $n_3 \text{ and } n_4$,be the number one red and b of red and black balls, respectively, in box II. A ball is drawn at random from box 1 and transferred to box II. If the probability of drawing a red ball from box I,

after this transfer, is $\frac{1}{3}$ then the correct option(s) with the possible values of n_1 and n_2, is(are)

A. $n_1 = 4, n_2 = 6$

B. $n_1 = 2, n_2 = 3$

C. $n_1 = 10, n_2 = 20$

D. $n_1 = 3, n_2 = 6$

Answer: C::D

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124. Football teams T_1 and T_2 have to play two games against each other. It is assumed that the outcomes of the two games are independent. The probabilities of T_1 winning,drawing and losing a game against T_2 are $\frac{1}{2}, \frac{1}{6}$ and $\frac{1}{3}$, respectively. Each teams gets 3 points for a win, 1 point of a drawn and 0 point for a loss in a games.

$P(X > T)$ is

A. $\frac{1}{4}$

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

C. $\frac{1}{2}$

D. $\frac{7}{12}$

Answer: B

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125. Football teams T1 and T2 have to play two games against each other . It is assumed that the outcomes of the two games are independent.The probability of T1 winning , drawing and loosing the game against T2 are $\frac{1}{2}, \frac{1}{6}$ and $\frac{1}{3}$respectively. each team gets 3 points for a win , 1point for a draw and 0 point for a loss in a game. let x and Y denote the total points scored by team T1 and T2 respectively after two games. then, P(X=Y), is

A. $\frac{11}{36}$

B. $\frac{1}{3}$

C. $\frac{13}{36}$

D. $\frac{1}{2}$

Answer: C

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126. A computer producing factory has only two plants T_1 and T_2. Plant T_1 produces 20% and plant T_2 produces 80% of the total computers produced. 7% of computers produced in the factory turn out to be defective. It is known that P(computer turns out to bedefective, given that it is produced in plant T_1)=10P (computer turns out to be defective, given that it is produced in plant T_2), where P(E) denotes the probability of an event E.A computer produced in the factory is randomly selected and it does not turn out to be defective. Then, the probability that it is produced in plant T_2, is

A. $\frac{36}{73}$

B. $\frac{47}{79}$

C. $\frac{78}{93}$

D. $\frac{75}{83}$

Answer: C

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Section- II (Assertion -Reason Types MCQs)

1. Statement-1: 20 persons are sitting in a row. Two of these persons are selected at random. The probability that the two selected persons are not together is 0.9.

Statement-2 :If $\overline{A}$ denotes the negation of an event A, then $P\left(\overline{A}\right) = 1 - P(A)$.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: A

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2. Statement-1: A natural x is chosen at random from the first 100 natural numbers. The probability that

$\frac{(x-10)(x-50)}{x-30} < 0$ is 0.28

Statement-2 : For any event $A, 0 \leq P(A) \leq 1$.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: B

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3. Statement-1: the probability of drawing either a king or an ace from a pack of 52 playing cards is $2/13$.

Statement-2: For any two events A and B,

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: A

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4. Let A and B be two events such that $P(A \cup B) = P(A \cap B)$. Then,

Statement-1: $P\left(A \cap \overline{B}\right) = P\left(\overline{A} \cap B\right) = 0$

Statement-2: `P(A)+P(B)=1

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: C

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5. Statement-1 : If A and B are two events such that P(A)=1, then A and B are independent.

Statement-2: A and B are two independent events iff

$P(A \cap B) = P(A)P(B)$

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: A

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6. Let A, B, C be three mutually independen events associated to a random experiment.

Statement-1: A and $B \cup C$ are independent.

Statement-2: A and $B \cap C$ are independent.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: B

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7. Statement-1: Let $n \leq 3$ and $A_1, A_2, . . , A_n$ be n independent events such that $P(A_k) = \frac{1}{k+1}$ for $1 \leq k \leq n$, then $P\left(\overline{A}_1 \cap \overline{A}_2 \cap \overline{A}_3 \cap . . \cap \overline{A}_n\right) = \frac{1}{n+1}$

Statement-2: Let $A_1, A_2, A_3, . . , A_n$ be $n(\leq 3)$ events associated to a random experiment . Then, $A_1, A_2, . . , A_n$ are independent iff $P(A_1 \cap A_2 \cap . . \cap A_n) = P(A_1)P(A_2). . P(A_n)$.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: C

 Watch Video Solution

8. Let A, B and C be three events such that P(C)=0

Statement-1: $P(A \cap B \cap C) = 0$

Statement-2: $P(A \cup B \cup C) = P(A \cup B)$

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: B

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9. There are two persons A and B such that the chances of B speaking truth of A and A speaks truth in more than 25% cases.

Statement-1: If A and B contradict each other in narrating the same

statement with probability $1/2$, then it is certain that B never tells a lie.

Statement-2: The probability that A speaks truth is $1/2$.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: A

Watch Video Solution

10. A fair die is thrown twice. Let (a, b) denote the outcome in which the first throw shows 'a' and the second throw shows 'b' . Let A and B be the following events :

A={(a,b): a is even}, B={(a,b): b is even}

Statement-1: If C={(a,b): a+b is odd}, then

$$P(A \cap B \cap C) = \frac{1}{8}$$

Statement-2: If D={(a,b): a+b is even}, then

$$P(A \cap B \cap D / A \cup B) = \frac{1}{3}$$

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: D

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11. Consider the system of equations ax + by = 0; cx + dy = 0, where $a, b, c, d \in \{0, 1\}$)STATEMENT-1: The probability that the system of

equations has a unique solution is 3/8 STATEMENT-2: The probability that the system of equations has a solution is 1

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: B

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12. Let $H_1, H_2, H_3, . . , H_n$ be mutually exclusive and exhaustive events with $P(H_1) > 0, i = 1, 2, . . , n.$ Let E be any other event with $0 < P(E) < 1.$

Statement-1 : $P(H_i/E) > P(E/H_i)P(H_i)$ for i=1,2,..,n.

Statement-2 : $\sum_{i=1}^{n} P(H_i) = 1$

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: D

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13. Four numbers are chosen at random (without replacement) from the set {1, 2, 3, ..., 20}. Statement-1: The probability that the chosen numbers when arranged in some order will form an AP Is $\frac{1}{85}$. Statement-2: If the four chosen numbers from an AP, then the set of all possible values of

common difference is {1, 2, 3, 4, 5}. (1) Statement-1 is true, Statement-2 is true; Statement-2 is not the correct explanation for Statement-1 (2) Statement-1 is true, Statement-2 is false (3) Statement-1 is false, Statement-2 is true (4) Statement-1 is true, Statement-2 is true; Statement-2 is the correct explanation for Statement-1

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: C

14. एक विशेष समस्या को A और B द्वारा स्वतंत्र रूप से हल करने की प्रायिकताएं क्रमशः $\frac{1}{2}$ और $\frac{1}{3}$ हैं। यदि दोनों स्वतंत्र रूप से समस्या हल करने का प्रयास करते हैं। तो प्रायिकता ज्ञात कीजिए कि

(i) समस्या हल हो जाती है

(ii) उनमें से तथ्यतः कोई एक समस्या हल कर लेता है।

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: A

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15. Let A and B be two independent events.

Statement-1: If P(A)=0.3 and $P\left(A \cup \overline{B}\right) = 0.8$, then $P(B) = \frac{2}{7}$

Statement-2: For any event E, $P\left(\overline{E}\right) = 1 - P(E)$.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: D

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Section I - Mcqs

1. If A and B are two independent events, then the probability that only one of A and B occur is

A. $P(A) + P(B) - 2P(A \cap B)$

B. $P(A) + P(B) - P(A \cap B)$

C. $P(A) + P(B)$

D. none of these

Answer: A

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2. If A and B are two events, then P (neither A nor B) equals

A. $1 - P(A \cup B)$

B. $P(\overline{A}) + P(\overline{B})$

C. $1 - P(A) - P(B)$

D. none of these

Answer: A

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3. A drawer contains 5 brown socks and 4 blue socks well mixed a man reaches the drawer and pulls out socks at random. What is the probability that they match?

A. $4/9$

B. $5/8$

C. $5/9$

D. $7/12$

Answer: A

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4. If M and N are any two events, then the probability that exactly one of them occurs is

A. $P(A) + P(B) + 2P(A \cap B)$

B. $P(A) + P(B) - P(A \cap B)$

C. $P(\overline{A}) + P(\overline{B}) + P(\overline{A} \cap \overline{B})$

D. $P(A \cap \overline{B}) + P(\overline{A} \cap \overline{B})$

Answer: D

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5. The probability that at least one of the events $AandB$ occurs is 0.6. If $AandB$ occur simultaneously with probability 0.2, then find $P(A) + P(B)$.

A. 0.4

B. 0.8

C. 1.2

D. 1.4

Answer: C

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6. Three identical dice are rolled once. The probability that the same number will appear on each of them, is

A. $1/6$

B. $1/36$

C. $1/18$

D. $3/28$

Answer: B

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7. Let A and B be two independent events. The probability of their simultaneous occurrence is 1/8 and the probability that neither occurs is 3/8. Find $P(A) and P(B)$.

A. $\frac{1}{2}, \frac{1}{4}$

B. $\frac{1}{3}, \frac{1}{4}$

C. $\frac{1}{4}, \frac{1}{4}$

D. $\frac{1}{5}, \frac{1}{2}$

Answer: A

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8. E and F are two independent events. The probability that both e and F happen is 1/12 and the probability that neither E nor F happens is 1/2. Then

A. $P(E) = \frac{1}{3}, P(F) = \frac{1}{4}$

B. $P(E) = \frac{1}{2}, P(F) = \frac{1}{6}$

C. $P(E) = \frac{1}{6}, P(F) = \frac{1}{2}$

D. $P(E) = \frac{1}{4}, P(F) = \frac{2}{3}$

Answer: A

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9. If m rupee coins and n ten paise coins are placed in a line, then the probability that the extreme coins are ten paise coins, is

A. . $(m+n)C_m$

B. $\frac{n(n+1)}{(m+n)(m+n-1)}$

C. . ${}^{m+n}P_m$

D. . ${}^{m+n}P_n$

Answer: B

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10. If A and B are two events such that $P(A) = 3/4$ and $P(B) = 5/8$, then

A. $P(A \cup B) \geq \frac{3}{4}$

B. $P(A' \cap B) \leq \frac{1}{4}$

C. $\frac{3}{4} \leq P(A \cap B) \leq \frac{5}{8}$

D. all of these

Answer: A

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11. If there are 6 girls and 5 boys who sit in a row, then the probability that no two boys sit together is

A. $\frac{6!6!}{2!11!}$

B. $\frac{7!5!}{2!11!}$

C. $\frac{6!7!}{2!11!}$

D. none of these

Answer: C

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12. A mapping is select at random from the set of all the mappings of the set $A = \{1, 2, n\}$ into itself. Find the probability that the mapping selected is an injection.

A. $\frac{1}{n^n}$

B. $\frac{1}{n!}$

C. $\frac{(n-1)!}{n^{n-1}}$

D. $\frac{n!}{n^{n-1}}$

Answer: C

Watch Video Solution

13. In Q. 12 the probability that the mapping is a bisection, is

A. $\frac{1}{n^n}$

B. $\frac{1}{n!}$

C. $\frac{(n-1)!}{n^{n-1}}$

D. $\frac{n!}{n^{n-1}}$

Answer: C

View Text Solution

14. Let A and B be two finite sets having m and n elements respectively such that $m \leq n$. A mapping is selected at random from the set of all mappings from A to B. The probability that the mapping selected is an injection, is

A. $\frac{n!}{(n-m)!m^n}$

B. $\frac{n!}{(n-m)!n^m}$

C. $\frac{m!}{(n-m)!n^m}$

D. $\frac{m!}{(n-m)!m^n}$

Answer: B

Watch Video Solution

15. In Q. 14 if $m > n$ then the probability that the mapping selected is an injective map is

A. $\frac{n!}{(n-m)!m^n}$

B. $\frac{n!}{(n-m)!n^m}$

C. $\frac{.^nC_m}{n^m}$

D. none of these

Answer: D

View Text Solution

16. Two dice are rolled one after the other.The probability that the number on the first dice is smaller than that of the number on second dice is-

A. $1/2$

B. $7/18$

C. $3/4$

D. $5/12$

Answer: D

Watch Video Solution

17. A natural number is chosen at random from the first 100 natural numbers. The probability that $x + \frac{100}{x} > 50$ is $1/10$ b. $11/50$ c. $11/20$ d. none of these

A. $1/10$

B. $11/50$

C. $11/20$

D. none of these

Answer: C

Watch Video Solution

18. A binary operation is chosen at random from the set of all binary operations on a set A containing n elements. The probability that the binary operation is commutative, is

A. $\frac{n^n}{n^{n^2}}$

B. $\frac{n^{n/2}}{n^{n^2}}$

C. $\frac{n^{n/2}}{n^{n^2/2}}$

D. none of these

Answer: C

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19. In the above question the probability that the binary operation is non-commutative is

A. $\frac{n^{n^2} - n^{n(n+1)}}{n^{n^2}}$

B. $\frac{n^{n^2} - n^{\frac{n(n+1)}{2}}}{n^{n^2}}$

C. $\frac{n^{n^2/2} - n^{\frac{n(n+1)}{2}}}{n^{n^2/2}}$

D. none of these

Answer: B

View Text Solution

20. A four figure number is formed of the figures 1, 2, 3, 4, 5 with no repetitions. The probability that the number is divisible by 5 is $3/4$ b. $1/4$

c. $1/8$ d. none of these

A. $3/4$

B. $1/4$

C. $1/8$

D. none of these

Answer: B

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21. In the above question the probability that the number is odd is

A. $3/4$

B. $1/4$

C. $1/8$

D. none of these

Answer: A

View Text Solution

22. Suppose $n(\geq 3)$ persons are sitting in a row. Two of them are selected at random. The probability that they are not together is (A) $1-\frac{2}{n}$ (B) $\frac{2}{n-1}$ (C) $1-\frac{1}{n}$ (D) nonoe of these

A. $1-\frac{2}{n}$

B. $\frac{2}{n-1}$

C. $1-\frac{1}{n}$

D. none of these

Answer: A

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23. India plays two matches each with West Indies and Australia. In any match the probabilities of India getting points $0, 1 \text{ and } 2$ are $0.45, 0.05 \text{ and } 0.50$ respectively. Assuming that the outcomes are

independent, the probability of India getting at least 7 points is (a) 0.8750 (b) 0.0875 (c) 0.0625 (d) 0.0250

A. 0.8750

B. 0.0875

C. 0.0625

D. 0.0250

Answer: B

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24. In shuffling a pack of 52 playing cards, four are accidently dropped; find the chance that the missing cards should be one from each suit.

A. $\frac{1}{256}$

B. $\frac{1}{270725}$

C. $\frac{2197}{20825}$

D. none of these

Answer: C

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25. If A and B are independent events such that $P(A) > 0, P(B) > 0$, then

A. A and B are mutually exclusive

B. A and $\overline{B}$ are dependent

C. $\overline{A}$ and B are dependent

D. $P(A/B) + P(\overline{A}/B) = 1.$

Answer: D

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26. If A and B are independent events such that $P(A) > 0, P(B) > 0$, then

A. A and B are mutually exclusive

B. A and $\overline{B}$ are independent

C. $A(A \cup B) = P(\overline{A})P(\overline{B})$

D. $P(A/B) = P(\overline{A}/B)$

Answer: B

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27. Twelve balls are distributed among three boxes, find the probability that the first box will contains three balls.

A. $\frac{110}{9}\left(\frac{2}{3}\right)^{10}$

B. $\frac{9}{110}\left(\frac{2}{3}\right)^{10}$

C. $\frac{.^{12}C_3}{12^3} \times 2^9$

D. $\frac{.^{12}C_3}{3^{12}}$

Answer: A

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28. A committee of five is to be chosen from a group of 9 people. The probability that a certain married couple will either serve together or not at all is

A. $1/2$

B. $5/9$

C. $4/9$

D. $2/3$

Answer: C

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29. The probability of two events A and B are 0.25 and 0.50 respectively. The probability of their simultaneous occurrences 0.15. Find the probability that neither A nor B occurs.

A. 0.39

B. 0.25

C. 0.11

D. none of these

Answer: A

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30. For any two events A and B in a sample space which one of the following is incorrect ?

A. $P(A/B) \geq \frac{P(A)+P(B)-1}{P(B)}$, $P(B) \neq 0$, is always true

B. $P\left(A \cap \overline{B}\right) = P(A) - P(A \cap B)$ does not hold

C. $P(A \cup B) = 1 - P(\overline{A})P(\overline{B})$, if A and B are independent

D. $P(A \cup B) = 1 - P(\overline{A})P(\overline{B})$, if A and B are disjoint.

Answer: D

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31. The odds against a certain event are 5 to 2, and the odds in favor of another event independent of the former are 6 to 5. Find the chance that one at least of the events will happen.

A. $25/77$

B. $52/77$

C. $12/77$

D. $65/77$

Answer: B

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32. A bag contains four tickets marked with numbers 112, 121, 211,222. One ticket is drawn at random from the bag. Let E_i (i = 1,2,3) denote the event that i^th digit on the ticket is 2. Then which of the following is incorrect ?

A. E_1 and E_2 are independent

B. E_2 and E_3 are independent

C. E_3 and E_1 are independent

D. E_1, E_2 and E_3 are independent

Answer: D

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33. A box contains 2 black, 4 white, and 3 red balls. One ball is drawn at random from the box and kept aside. From the remaining balls in the box, another ball is drawn at random and kept aside the first. This process is repeated till all the balls are drawn front the box. The probability that the

balls drawn are in the sequence of 2 black, 4 white, and 3 red is $1/1260$ b. $1/7560$ c. $1/126$ d. none of these

A. $\frac{1}{1260}$

B. $\frac{1}{7560}$

C. $\frac{1}{126}$

D. none of these

Answer: A

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34. A student appears for tests I, II and III. The student is considered successful if he passes in tests I, II or I, III or all the three. The probabilities of the Student passing in tests II and III are m, n and $\frac{1}{2}$ respectively. If the probability of the student to be successful is $\frac{1}{2}$, then which one of the following is correct? (a) $m(1+n)=1$ (B) $n(1+m)=1$ (C) $m=1$ (D) $mn=1$

A. p=q=1

B. $p = q = \frac{1}{2}$

C. p=0, q=1

D. there are infinite values of p and q

Answer: D

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35. A cricket club has 15 members, of them of whom only 5 can bowl. If the names of 15 members are put into a box and 11 are drawn at random, then the probability of getting an eleven containing at least 3 bowlers is $7/13$ b. $6/13$ c. $11/158$ d. $12/13$

A. $7/13$

B. $6/13$

C. $11/15$

D. $12/13$

Answer: D

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36. If $\frac{1+4p}{p}, \frac{1-p}{4}, \frac{1-2p}{2}$ are probabilities of three mutually exclusive events, then

A. $\frac{1}{3} \leq p \leq \frac{1}{2}$

B. $\frac{1}{2} \leq p \leq \frac{2}{3}$

C. $\frac{1}{6} \leq p \leq \frac{1}{2}$

D. none of these

Answer: D

Watch Video Solution

37. An unbiased die with faced marked 1, 2, 3, 4, 5, and 6 is rolled four times. Out of four face value obtained, the probability that the minimum

face value is not less than 2 and the maximum face value is not greater than five is then $16/81$ b. $1/81$ c. $80/81$ d. $65/81$

A. $16/81$

B. $1/81$

C. $80/81$

D. $65/81$

Answer: A

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38. Three numbers are chosen from 1 to 30. The probability that they are not consecutive is

A. $\frac{144}{145}$

B. $\frac{143}{145}$

C. $\frac{142}{145}$

D. none of these

Answer: A

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39. The probability that an event A happens in one trial of an experiment, is 0.4 There independent trials of the experiments are performed. The probability that the event A happens atleast once, is

A. 0.936

B. 0.784

C. 0.904

D. none of these

Answer: B

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40. If two events A and B are such that $P(A) > 0$ and $P(B) \neq 1$, then $P\left(\frac{\overline{A}}{\overline{B}}\right)$ is equal to

A. $1 - P\left(A / \overline{B}\right)$

B. $1 - P\left(\overline{A} / B\right)$

C. $\frac{1 - P(A \cap B)}{P\left(\overline{B}\right)}$

D. $P\frac{\overline{A}}{P\left(\overline{B}\right)}$

Answer: A

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41. A speaks truth in 605 cases and B speaks truth in 70% cases. The probability that they will say the same thing while describing a single event is $2 / 19$ b. $3 / 29$ c. $17 / 19$ d. $4 / 29$

A. 0.56

B. 0.54

C. 0.38

D. 0.94

Answer: B

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42. Let X be a set containing n elements. Two subsets A and B of X are chosen at random, the probability that $A \cup B = X$ is

A. $\frac{.^{2n}C_n}{2^{2n}}$

B. $\left(\frac{3}{4}\right)^n$

C. $\frac{1}{.^{2n}C_n}$

D. none of these

Answer: B

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43. Fifteen coupens are numbered $1, 2, 3, \ldots 15$ respectively. Seven coupons are selected at random one at a time with replacement The Probability that the largest number appearing on a selected coupon is 9 is :

A. $\left(\frac{9}{16}\right)^6$

B. $\left(\frac{8}{15}\right)^7$

C. $\left(\frac{3}{5}\right)^7$

D. none of these

Answer: D

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44. If $P(A \cap B) = \frac{1}{2}, P(A \cap B) = \frac{1}{3}, P(A) = p, P(B) = 2p,$ then find the value of p.

A. $1/3$

B. $7/18$

C. $4/9$

D. $1/2$

Answer: B

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45. If $P(A \cup B) = 3/4$ and $P(\overline{A}) = 2/3,$ then $P(\overline{A} \cap B)$ is equal to

A. $1/12$

B. $7/12$

C. $5/12$

D. $1/2$

Answer: C

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46. Find the probability that in a random arrangement of the letters of the word UNIVERSITY the two Is do not come together.

A. $4/5$

B. $1/5$

C. $1/10$

D. $9/10$

Answer: A

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47. A letter is taken out at random from 'ASSISTANT and another is taken out from 'STATISTICS. The probability that they are the same letters, is

A. $1/45$

B. $13/90$

C. $19/90$

D. none of these

Answer: C

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48. Out of 40 consecutive integers, two are chosen at random, the probability that their sum is odd is

A. $14/29$

B. $20/39$

C. $1/2$

D. none of these

Answer: B

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49. Three integers are chosen at random from the first 20 integers. The probability that their product is even is $\frac{2}{19}$ b. $\frac{3}{29}$ c. $\frac{17}{19}$ d. $\frac{4}{19}$

A. $2/19$

B. $3/29$

C. $17/19$

D. $4/29$

Answer: C

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50. Three identical dice are rolled once. The probability that the same number will appear on each of them, is (a) $\frac{1}{6}$ (b) $\frac{1}{36}$ (c) $\frac{1}{18}$ (d) $\frac{3}{28}$

A. $1/6$

B. $1/18$

C. $1/36$

D. none of these

Answer: C

Watch Video Solution

51. Let A, B, C be three events such that A and B are independent and $P(C) = 0$, then events A, B, C are

A. A and C are independent

B. B and C are independent

C. A, B and C are independent

D. all of these

Answer: D

Watch Video Solution

52. If two of the 64 squares are chosen at random on a chess board, the probability that they have a side in common is

A. $1/9$

B. $1/18$

C. $2/7$

D. none of these

Answer: B

Watch Video Solution

53. An ordinary cube has four blank faces, one face marked 2 and another marked 3. Then the probability of obtaining 9 in 5 throws, is

A. $\frac{31}{7776}$

B. $\frac{5}{2592}$

C. $\frac{5}{1944}$

D. $\frac{5}{1296}$

Answer: D

Watch Video Solution

54. The chance of an event happening is the square of the chance of a second event but the odds against the first are the cube of the odds against the second. The chances of the events are

A. $\frac{1}{9}, \frac{1}{3}$

B. $\frac{1}{16}, \frac{1}{4}$

C. $\frac{1}{4}, \frac{1}{2}$

D. none of these

Answer: A

Watch Video Solution

55. The probability that the 13^{th} day of a randomly chosen month is a Friday, is :-

A. $\frac{1}{12}$

B. $\frac{1}{7}$

C. $\frac{1}{84}$

D. none of these

Answer: C

Watch Video Solution

56. There are 20 cards. Ten of these cards have the letter I printed on them and the other 10 have the letter I printed on them. If three cards picked up at random and kept in the same order, the probability of making word IIT is $1/9, 1/3$ b. $1/16, 1/4$ c. $1/4, 1/2$ d. none of these

A. $\frac{4}{27}$

B. $\frac{5}{38}$

C. $\frac{1}{8}$

D. $\frac{9}{80}$

Answer: B

Watch Video Solution

57. Two coins and a die are tossed. The probability that both coins fall heads and the die shows a 3 or 6, is

A. $1/8$

B. $1/12$

C. $1/16$

D. none of these

Answer: B

Watch Video Solution

58. A die is rolled thrice, find the probability of getting a larger number each time than the previous number.

A. $\frac{15}{216}$

B. $\frac{5}{54}$

C. $\frac{13}{216}$

D. $\frac{1}{18}$

Answer: B

Watch Video Solution

59. One hundred cards are numbered from 1 to 100. The probability that a randomly chosen card has a digit 5 is :

A. $\frac{1}{100}$

B. $\frac{9}{100}$

C. $\frac{19}{100}$

D. none of these

Answer: C

Watch Video Solution

60. Three six faced dice are tossed together, then the probability that exactly two of the three numbers are equal is :

A. $165/216$

B. $177/216$

C. $51/216$

D. $90/216$

Answer: D

Watch Video Solution

61. A party of m ladies sit at a round table. Find odds against two specified ladies sitting nextto each other

A. $2:n-3$

B. $n-3:2$

C. $n-2:2$

D. $2:n-2$

Answer: B

Watch Video Solution

62. A and B stand in a ring with 10 other persons. If the arrangement of the persons is at random, then the probability that there are exactly 3 persons between A and B is

A. $2/11$

B. $9/11$

C. $1/11$

D. none of these

Answer: A

Watch Video Solution

63. Three letters, to each of which corresponds an envelope, are placed in the envelopes at random. The probability that all the letters are not placed in the right envelopes, is

A. $1/6$

B. $5/6$

C. $1/3$

D. $2/3$

Answer: C

Watch Video Solution

64. The sum of two positive quantities is equal to $2n$. the probability that their product is not less than 3/4 times their greatest product is $3/4$ b. $1/4$ c. $1/2$ d. none of these

A. $3/4$

B. $1/2$

C. $1/4$

D. none of these

Answer: B

Watch Video Solution

65. If p is the probability that a man aged x will die in a year, then the probability that out of n men A_1, A_2, A_n each aged x, A_1 will die in an year and be the first to die is $1-(1-p)^n$ b. $(1-p)^n$ c. $1/n\left[1-(1-p)^n\right]$ d. $1/n(1-p)^n$

A. $1-(1-p)^n$

B. $(1-p)^n$

C. $\frac{1}{n}\left[1-(1-p)^n\right]$

D. $\frac{1}{n}(1-p)^n$

Answer: C

Watch Video Solution

66. If the letters of the word MISSISSIPPI are written down at random in a row, what is the probability that four S s come together.

A. $\frac{8}{165}$

B. $\frac{4}{165}$

C. $\frac{161}{165}$

D. none of these

Answer: B

Watch Video Solution

67. If the letters of the word MISSISSIPPI are written down at random in a row, what is the probability that four S s come together.

A. $\frac{5}{33}$

B. $\frac{7}{33}$

C. $\frac{6}{31}$

D. none of these

Answer: B

Watch Video Solution

68. If the letters of the word REGULATIONS be arranged at random, find the probability that there will be exactly four letters between the R and the E.

A. $\frac{6}{55}$

B. $\frac{3}{55}$

C. $\frac{49}{55}$

D. none of these

Answer: A

Watch Video Solution

69. If the letters of the word REGULATIONS be arranged at random, find the probability that there will be exactly four letters between the R and the E.

A. $1/10$

B. $1/9$

C. $1/5$

D. $1/2$

Answer: B

Watch Video Solution

70. A bag contains a white and b black balls. Two players, $AandB$ alternately draw a ball from the bag, replacing the ball each time after the draw till one of them draws a white ball and wins the game. A begins the game. If the probability of A winning the game is three times that of B, then find the ratio $a:b$

A. $1:2$

B. $2:1$

C. $1:1$

D. none of these

Answer: C

Watch Video Solution

71. Two number $aandb$ aer chosen at random from the set of first 30 natural numbers. Find the probability that $a^2 - b^2$ is divisible by 3.

A. $\frac{9}{87}$

B. $\frac{12}{87}$

C. $\frac{15}{87}$

D. $\frac{47}{87}$

Answer: D

Watch Video Solution

72. Cards are drawn one by one without replacement from a pack of 52 cards. The probability that 10 cares will precede the first ace is $241/1456$ b. $18/625$ c. $451/884$ d. none of these

A. $\frac{241}{1456}$

B. $\frac{164}{4165}$

C. $\frac{451}{884}$

D. none of these

Answer: B

Watch Video Solution

73. If A and B are independent events, then A' and B' are also independent.

A. not independent

B. also independent

C. mutually exclusive

D. none of these

Answer: B

Watch Video Solution

74. A bag contains 4 tickets numbered 1,2,3,4 and another bag contains 6 ticktets numbered 2,4,6,7,8,9. One bag is chosen and a ticket is drawn. The probability that the ticket bears the number 4, is

A. $1/48$

B. $1/8$

C. $5/24$

D. none of these

Answer: C

Watch Video Solution

75. A six-faced dice is so biased that it is twice as likely to show an even number as an odd number when thrown. It is thrown twice, the probability that the sum of two numbers thrown is even is $1/12$ b. $1/6$ c. $1/3$ d. $5/9$

A. $5/9$

B. $5/8$

C. $1/2$

D. none of these

Answer: B

Watch Video Solution

76. A bag contains an assortment of blue and red balls. If two balls are drawn at random, the probability of drawing two red balls is five times the probability of drawing two blue balls. Furthermore, the probability of drawing one ball of each color is six time the probability of drawing two balls. The number of red and blue balls in the bag is $6, 3$ b. $3, 6$ c. $2, 7$ d. none of these

A. 6,3

B. 3,6

C. 2,3

D. none of these

Answer: A

Watch Video Solution

77. If a single letter is selected at random from the word 'PROBABILITY', then the probability that it is a vowel is

A. $3/11$

B. $4/11$

C. $2/11$

D. none of these

Answer: B

Watch Video Solution

78. Three letters are written to different persons and addressess to three envelopes are also written. Without looking at the addresses, the probability that probability that the letters go into right envelopes, is

A. $1/27$

B. $1/6$

C. $1/9$

D. none of these

Answer: B

Watch Video Solution

79. A coin is tossed three times. The probability of getting head and tail alternately, is

A. $1/8$

B. $1/2$

C. $1/4$

D. none of these

Answer: C

Watch Video Solution

80. A bag contains 50 tickets numbered 1, 2, 3, .., 50 of which five are drawn at random and arranged in ascending order of magnitude `(x_1

A. $\frac{.^{20}C_2}{.^{50}C_5}$

B. $\frac{.^{29}C_2}{.^{50}C_5}$

C. $\frac{.^{20}C_2 \times .^{29}C_2}{.^{50}C_5}$

D. none of these

Answer: C

Watch Video Solution

81. One ticket is selected at random from 100 tickets numbered 00, 01, 02,.., 99. Suppose A and B are the sum and product of the digit found on the ticket. Then $P(A = 7/B = 0)$ is given by

A. $2/13$

B. $2/19$

C. $1/50$

D. none of these

Answer: B

Watch Video Solution

82. If the probability that A and B will die within a year are p and q respectively, then the probability that only one of them will be alive at the end of the year, is

A. p+q

B. p+q=2pq

C. p+q-pq

D. p+q+pq

Answer: B

Watch Video Solution

83. Four positive integers are taken at random and are multiplied together. Then the probability that the product ends in an odd digit than 5 is

A. $609/625$

B. $16/625$

C. $2/5$

D. $3/5$

Answer: B

Watch Video Solution

84. Two cards are drawn from a well shuffled deck of 52 cards.The probability that one is red card and the other is a queen

A. $4/51$

B. $16/221$

C. $50/663$

D. none of these

Answer: C

Watch Video Solution

85. The probability that the roots of the equation $x^2 + nx + \frac{1}{2} + \frac{n}{2} = 0$ are real where $n \in N$ such that $n \leq 5$, is

A. $1/5$

B. $2/5$

C. $3/5$

D. $4/5$

Answer: D

Watch Video Solution

86. A matrix is chosen at random from the set of all 2×2 matrices with elements 0 and 1 only. The probability that determinant is positive, is

A. $1/2$

B. $3/16$

C. $11/16$

D. $13/16$

Answer: B

Watch Video Solution

87. If an integer p is chosen at random in the interval $0 \leq p \leq 5,$ then the probality that the roots of the equation $x^2 + px + \frac{p}{4} + \frac{1}{2} = 0$ are real is -

A. $1/5$

B. $2/5$

C. $3/5$

D. $4/5$

Answer: C

Watch Video Solution

88. Dialling a telephone number an old man forgets the last two digits remembering only that these are different dialled at random. The probability that the number is dialled correctly is $1/45$ b. $1/90$ c. $1/100$ d. none of these

A. $1/45$

B. 190

C. $1/100$

D. none of these

Answer: B

Watch Video Solution

89. Three squares of Chess board are selected at random. Find the probability of getting 2 squares of one colour and other of a different colour.

A. $16/21$

B. $8/21$

C. $32/12$

D. none of these

Answer: A

Watch Video Solution

90. If n integers taken art random are multiplied together , then the probability that eh last digit of the product is 1, 3, 7, or 9 is $2^n/5^n$ b. $4^n - 2^n/5^n$ c. $4^n/5^n$ d. none of these

A. $\frac{2^n}{5^n}$

B. $\frac{4^n - 2^n}{5^n}$

C. $\frac{4^n}{5^n}$

D. none of these

Answer: A

Watch Video Solution

91. If n positive integers are taken at random and multiplied together, then the probability that the last digit of the product is 2,4,6 or 8, is

A. $\frac{8^n}{5^n}$

B. $\frac{8^n - 2^n}{5^n}$

C. $\frac{4^n - 2^n}{5^n}$

D. none of these

Answer: C

Watch Video Solution

92. The probability that a teacher will give a surprise test during any class is 1/5. If a student is absent on two day what is the probability that he will miss atleast one test.

A. $4/5$

B. $2/5$

C. $7/5$

D. $9/25$

Answer: D

Watch Video Solution

93. Fifteen coupens are numbered $1, 2, 3, \ldots 15$ respectively. Seven coupons are selected at random one at a time with replacement The Probability that the largest number appearing on a selected coupon is 9 is :

A. $\left(\frac{9}{10}\right)^6$

B. $\left(\frac{8}{15}\right)^7$

C. $\left(\frac{3}{5}\right)^7$

D. none of these

Answer: C

Watch Video Solution

94. Five coins whose faces are marked 2, 3 are thrown. What is the probability of obtaining a total of 12?

A. $5/32$

B. $11/16$

C. $5/16$

D. $10/16$

Answer: C

Watch Video Solution

Section II - Assertion Reason Type

1. Statement-1 : If $\frac{1}{5}(1+5p), \frac{1}{3}(1+2p), \frac{1}{3}(1-p)$ and $\frac{1}{5}(1-3p)$ are probabilities of four mutually exclusive events, then p can take infinite

number of values.

Statement-2 : If A, B, C and D are four mutually exclusive events, then

$P(A), P(B), P(C), P(D) \geq 0$

and $P(A) + P(B) + P(C) + P(D) \leq 1$

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: A

 Watch Video Solution

2. Statement-1 : A natural number is chosen at random. The probability that the sum of the digits of its square is 93, is 0.

Statement-2 : A number is divisble by 31 iff sum of its digits is divisible by 31.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: C

Watch Video Solution

3. Let $m \in N$ and suppose three numbers are chosen at random from the numbers 1,2,3,..,m.

Statement-1 : If m=2n fro some $n \in N$, then the chosen numbers are in A.P. with probability $\frac{3}{2(2n-1)}$.

Statement-2 : If m=2n+1, then the chosen numbers are in A.P. with probability $\frac{3n}{4n^2-1}$

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: B

Watch Video Solution

4. A set P contains n elements. Two subsets A and B of P are chosen independently.

Statement-1 : Probability that $A \cap B = A$ is $(3/4)^n$

Statement-2 : Probability that $A \cup B = P$ is $(1/2)^n$.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: C

View Text Solution

5. Let A and B be two events such that $P(A) > 0$.

Statement-1 : If $P(A) + P(B) > 1$, then $P(B/A) \geq 1 - P\left(\overline{B}\right)/P(A)$

Statement-2 : If $P\left(A/\overline{B}\right) \geq P(A), \quad \text{then} \quad P(A) \geq P(A/B)$.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: C

View Text Solution

6. Let A, B and C be three events associated to a random experiment.

Statement-1 : If $A \cap B \subseteq C, \quad \text{then} \quad P(C) \geq P(A) + P(B) - 1.$

Statement-2 : If $P\{(A \cap B) \cup (B \cap C) \cup (C \cap A)\} \leq \quad \min\{P(A \cup B), P(B \cup C), P(C \cup$

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: B

View Text Solution

7. An urn contains m white and n black balls. A ball is drawn at random and is put back into the urn along with k additional balls of the same colour as that of the ball drawn. A ball is again drawn at random. What is the probability that the ball drawn now is white ?

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: B

Watch Video Solution

8. Four tickets marked 00, 01, 10, 11 respectively are placed in a bag. A ticket is drawn at random five times being replaced each time. Find the Probability that the sum of the the numbers on tickets thus drawn is 23.

A. $25/256$

B. $100/256$

C. $231/256$

D. none of these

Answer: A

Watch Video Solution

9. Two persons each make a single throw with a pair of dice. The probability that the throws are unequal is given by:

A. $1/6^3$

B. $73/6^3$

C. $51/6^3$

D. none of these

Answer: D

Watch Video Solution

10. $AandB$ toss a fair coin each simultaneously 50 times. The probability that both of them will not get tail at the same toss is $(3/4)^{50}$ b. $(2/7)^{50}$ c. $(1/8)^{50}$ d. $(7/8)^{50}$

A. $\left(\frac{3}{4}\right)^{50}$

B. $\left(\frac{2}{7}\right)^{50}$

C. $\left(\frac{1}{8}\right)^{50}$

D. $\left(\frac{7}{8}\right)^{50}$

Answer: A

Watch Video Solution

11. A bag contains $(2n+1)$ coins. It is known that n of these coins have a head on both sides whereas the rest of the coins are fair. A coin is picked up at random from the bag and is tossed. If the probability that the toss results in a head is $\frac{31}{42}$, determine the value of n.

A. 10

B. 11

C. 12

D. 13

Answer: A

Watch Video Solution

12. The number of seven digit numbers divisible by 9 formed with the digits ,1,2,3,4,5,6,7,8,9 without repetition is (A) 7! (B) ^9P_7(C)3(7!)(D) 4(7!)`

A. $2/9$

B. $1/5$

C. $1/3$

D. $1/9$

Answer: D

Watch Video Solution

13. Three dice are thrown simultaneously. What is the probability of getting 15 as the sum?

A. $1/216$

B. $1/72$

C. $5/108$

D. $1/18$

Answer: C

Watch Video Solution

14. Probability that a student will succeed in I.I.T. Entrance test is 0.2 and that he will succeed in Roorkee entrance test is 0.5. If the probability that he will be successful at both the places is 0.3, then the probability that he does not succeed at both the places, is

A. 0.4

B. 0.3

C. 0.2

D. 0.6

Answer: D

Watch Video Solution

15. A speaks the truth 4 out of 5 times. He throws a die and reports that there was a 6, the probability that actually there was a 6 is

A. $4/9$

B. $5/9$

C. $3/10$

D. none of these

Answer: A

Watch Video Solution

16. In an entrance test, there are multiple choice questions. There are four possible answers to each question, of which one is correct. The

probability that a student knows the answer to a question is 90%. If the gets the correct answer to a question, then find the probability that he was guessing.

A. $37/40$

B. $1/37$

C. $36/37$

D. $1/9$

Answer: B

Watch Video Solution

17. A letter is known to have come either from LONDON or CLIFTON. On the envelope just two consecutive letters ON are visible. What is the probability that the letter has come from (i) LONDON (ii) CLIFTON?

A. $5/17$

B. $12/17$

C. $17/30$

D. $3/5$

Answer: B

Watch Video Solution

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

A. $1/5$

B. $1/6$

C. $1/7$

D. $1/8$

Answer: A

Watch Video Solution

19. A bag contains 5 balls. Two balls are drawn and are found to be white. What is the probability that all the balls are white?

A. $3/4$

B. $3/5$

C. $3/10$

D. $1/2$

Answer: D

Watch Video Solution

20. A pack of playing cards was found to contain only 51 cards. If the first 13 cards, which are examined are all red, then the probability that the missing card is black is :-

A. $\frac{1}{3}$

B. $\frac{2}{3}$

C. $\frac{1}{2}$

D. $\frac{.^{25}C_{13}}{.^{51}C_{13}}$

Answer: B

Watch Video Solution

21. A biased die is tossed and the respective probabilities for various faces to turn up are

Face	:	1	2	3	4	5	6
Probability	:	0.1	0.24	0.19	0.18	0.15	0.14

If an even face has turned up, then the probability that it is face 2 or face 4, is

A. 0.25

B. 0.42

C. 0.75

D. 0.9

Answer: C

Watch Video Solution

22. In a bag there are three tickets numbered 1,2,3. A ticket is drawn at random and put back, and this is done four times. The probability that the sum of the numbers is even, is

A. $41/81$

B. $39/81$

C. $40/81$

D. none of these

Answer: A

Watch Video Solution

Chapter Test

1. Two friends $AandB$ have equal number of daughters. There are three cinema tickets which are to be distributed among the daughters of $AandB$. The probability that all the tickets go to the daughters of A is 1/20. Find the number of daughters each of them have.

A. 4

B. 5

C. 6

D. 3

Answer: D

Watch Video Solution

2. A bag contains n white and n red balls. Pairs of balls are drawn without replacement until the bag is empty. Show that the probability that each pair consists of one white and one red ball is $\frac{2^n}{\hat{} (2n)C_n}$

A. $\frac{1}{.^{2n}C_n}$

B. $\frac{2^n}{.^{2n}C_n}$

C. $\frac{2^n}{n!}$

D. $\frac{2^n}{(2n)!}$

Answer: B

Watch Video Solution

3. A bag contains 10 white and 3 black balls. Balls are drawn one-by-one without replacement till all the black balls are drawn. The probability that the procedure of drawing balls will come to an end at the seventh draw, is

A. $\frac{105}{286}$

B. $\frac{15}{286}$

C. $\frac{181}{286}$

D. none of these

Answer: B

Watch Video Solution

4. If $A_1, A_2, \ldots A_n$ are n independent events such that $P(A_k) = \frac{1}{k+1}, K = 1, 2, 3, \ldots, n;$ then the probability that none of the n events occur is

A. $\frac{n}{n+1}$

B. $\frac{1}{n+1}$

C. $\frac{n}{(n+1)(n+2)}$

D. none of these

Answer: B

Watch Video Solution

5. Three of the six vertices of a regular hexagon are chosen the random. What is the probability that the triangle with these vertices is equilateral.

A. $1/2$

B. $1/5$

C. $1/10$

D. $1/20$

Answer: C

Watch Video Solution

6. If $0 < P(A) < 1, 0 < P(B) < 1$ and $P(A \cup B) = P(A) + P(B) - P(A)P(B)$, then

A. $P(B/A) = P(B) - P(A)$

B. $P(A^c \cup B^c) = P(A^c) + P(B^c)$

C. $P\left((A \cup B)^c\right) = P(A^c)P(B^c)$

D. $P(A/B) = P(B)$

Answer: C

Watch Video Solution

7. Write the probability that a number selected at random from the set of first 100 natural numbers is a cube.

A. $\frac{1}{25}$

B. $\frac{2}{25}$

C. $\frac{3}{25}$

D. $\frac{4}{25}$

Answer: A

Watch Video Solution

8. For any two independent events E_1 and E_2 $P\{(E_1 \cup E_2) \cap (\overline{E_1} \cap \overline{E_2}\}$ is

A. $\leq 1/4$

B. $\geq 1/4$

C. $> 1/2$

D. none of these

Answer: A

Watch Video Solution

9. If Aand B are two events than the value of the determinant choosen at random from all the determinants of order 2 with entries 0 or 1 only is positive or negative respectively. Then (a) $P(A) \geq P(B)$ (b) $P(A) \leq P(B)$ (c) $P(A) = P(B) = \frac{1}{2}$ (d)None of these

A. $P(A) > P(B)$

B. $P(A) < P(B)$

C. $P(A) = P(B) = 1/2$

D. $P(A) = P(B)$

Answer: D

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10. The probability that a man will live 10 more years is $1/4$ and the probability that his wife will live 10 more years is $1/3$. Then the probability that neither will be alive in 10 years, is

A. $5/12$

B. $1/2$

C. $7/12$

D. $11/12$

Answer: B

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11. The probability that at least one of the events A and B occurs is 0.7 and they occur simultaneously with probability 0.2. Then, $P(\overline{A}) + P(\overline{B}) =$

A. 1.8

B. 0.6

C. 1.1

D. 1.4

Answer: C

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12. A man alternately tosses a coin and throws a die beginning with the coin. The probability that he gets a head in the coin before he gets a 5 or 6 in the dice is $3/4$ b. $1/2$ c. $1/3$ d. none of these

A. $3/4$

B. $1/2$

C. $1/3$

D. none of these

Answer: A

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13. A and B are two independent events.The probability that both A and B occur is 1/6 and the probability that neither of them occurs is 1/3.Then the probability of the two events are respectively:

A. $P(A) = 1/2, P(B) = 1/3$

B. $P(A) = 1/2, P(B) = 1/6$

C. $P(A) = 1/3, P(B) = 1/6$

D. none of these

Answer: A

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14. A, B, C are any three events. If P(S) denotes the probability of S happening, then $P(A \cap (B \cup C))$=

A. $P(A) + P(B) + P(C) - P(A \cap B) - P(A \cap C)$

B. $P(A) + P(B) + P(C) - P(B)P(C)$

C. $P(A \cap B) + P(A \cap C) - P(B)P(C)$

D. $P(A) + P(B) + P(C)$

Answer: C

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15. In a class of 125 students 70 passed in Mathematics, 55 in statistics, and 30 in both. Then find the probability that a student selected at

random from the class has passes in only one subject.

A. $13/25$

B. $3/25$

C. $17/25$

D. $8/25$

Answer: A

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16. A box contains 10 mangoes out of which 4 are rotten. Two mangoes are taken out together. If one of them is found to be good, then find the probability that the other is also good.

A. $1/3$

B. $8/15$

C. $5/13$

D. $2/3$

Answer: C

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17. A lot consists of 12 good pencils, 6 with minor defects and 2 with major defects. A pencil is choosen at random. The probability that this pencil is not defective, is

A. $3/5$

B. $3/10$

C. $4/5$

D. $1/2$

Answer: A

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18. 3 mangoes and 3 apples are in a box. If 2 fruits are chosen at random, the probability that one is a mango and the other is an apple, is

A. $3/5$

B. $5/6$

C. $1/36$

D. none of these

Answer: A

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19. There are 3 bags which are known to contain 2 white and 3 black, 4 white and 1 black, and 3 white and 7 black ball, respectively. A ball is drawn at random from one of the bags and found to the black ball. Then the probability that it was drawn from the bag containing the most black ball is $7/15$ b. $5/19$ c. $3/4$ d. none of these

A. $7/15$

B. $5/19$

C. $3/4$

D. none of these

Answer: A

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20. Among the workers in a factory only 30% receive bonus and among those receiving bonus only 20% are skilled. The probability that a randomly selected worker is skilled and is receiving bonus, is

A. 0.03

B. 0.02

C. 0.06

D. 0.015

Answer: C

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21. If two events $AandB$ are such that $P(A^o) = 0.3, P(B) = 0.4, andP(A \cap B^o) = 0.5$, then find the value of $P[B/(A \cup B^o)]$.

A. 0.20

B. 0.25

C. 0.30

D. 0.35

Answer: B

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22. An almirah stores 5 black and 4 white socks well mixed. A boy pulls out 2 socks at random. The probability that 2 are of the same colour is

A. $4/9$

B. $5/8$

C. $5/9$

D. $7/12$

Answer: A

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23. There are 4 white and 4 black in a bag and 3 balls are drawn at random. If balls of same colour are identical, the probability that none of them is black, is

A. $1/4$

B. $1/14$

C. $1/2$

D. none of these

Answer: A

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24. Cards are drawn one-by-one at random from a well-shuffled pack of 52 playing cards until 2 aces are obtained from the first time. The probability that 18 draws are obtained for this is $3/34$ b. $17/455$ c. $561/15925$ d. none of these

A. $3/34$

B. $17/455$

C. $561/15925$

D. none of these

Answer: C

Watch Video Solution

25. Five different objects A_1, A_2, A_3, A_4, A_5 are distributed randomly in 5 places marked 1, 2, 3, 4, 5. One arrangement is picked at random. The probability that in the selected arrangement, none of the object occupies the place corresponding to its number, is

A. $119/120$

B. $1/15$

C. $11/30$

D. none of these

Answer: C

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26. A father has 3 children with at least one boy. The probability that he has 2 boys and 1 girl is $1/4$ b. $1/3$ c. $2/3$ d. none of these

A. $1/4$

B. $1/3$

C. $2/3$

D. none of these

Answer: B

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27. Out of 13 applicants for a job, there are 5 women and 8 men. It is desired to select 2 persons for the job. The probability that at least one of the selected persons will be a woman is

A. $25/39$

B. $14/39$

C. $5/13$

D. $10/13$

Answer: A

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28. A box contains 100 tickets numbered $1, 2, 3.....100$. Two tickets are chosen at random. It is given that the maximum number on the two chosen tickets is not more than 10. The minimum number on them is 5, with probability

A. $13/15$

B. $1/330$

C. $1/3$

D. $1/9$

Answer: D

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29. A wire of length I is cut into three pieces. What Is the probability that the three pieces form a triangle ?

A. $1/2$

B. $1/4$

C. $2/3$

D. none of these

Answer: B

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30. If $x \in [0, 5]$, then what is the probability that $x^2 - 3x + 2 > 0$

A. $4/5$

B. $1/5$

C. $2/5$

D. none of these

Answer: A

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31. The probability that the graph of $y = 16x^2 + 8(a+5)x - 7a - 5 = 0,$ is strictly above the x-axis, If $a \in [-20, 0]$

A. $1/2$

B. $1/17$

C. $17/20$

D. none of these

Answer: D

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32. The probability that A can solve a problem is $2/3$ and B can solve it is $3/4$. If both attempt the problem, what is the probability that the problem gets solved ?

A. $11/12$

B. $7/12$

C. $5/12$

D. $9/12$

Answer: A

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33. A bag contains $(2n+1)$ coins. It is known that n of these coins have a head on both sides whereas the rest of the coins are fair. A coin is picked up at random from the bag and is tossed. If the probability that the toss results in a head is $\frac{31}{42}$, determine the value of n.

A. 10

B. 11

C. 12

D. 13

Answer: A

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34. Five boys and three girls are seated at random in a row. The probability that no boy sits between two girls, is

A. $1/56$

B. $1/8$

C. $3/28$

D. none of these

Answer: C

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35. A and B are two independent events such that $P(A) = \frac{1}{5}, P(A \cup B) = \frac{7}{10}$. Then , $P(\overline{B})$=

A. $3/8$

B. $2/7$

C. $7/9$

D. none of these

Answer: A

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36. A and B are two independent events such that their probabilities are $\frac{3}{10}$ and $\frac{2}{5}$ respectively. The probability of exactly one of the events happening, is

A. $23/50$

B. $1/2$

C. $31/50$

D. none of these

Answer: A

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37. There are 7 seats in a row. Three persons take seats at random the probability that the middle seat is always occupied and no two persons are consecutive is

A. $9/70$

B. $9/35$

C. $4/35$

D. none of these

Answer: C

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38. 10 different books and 2 different pens are given to 3 boys so that each gets equal number of things. The probability that the some boy does not receive both the pens, is

A. $8/11$

B. $7/11$

C. $2/3$

D. $6/11$

Answer: A

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39. 4 five-rupee coins, 3 two-rupee coins and 2 one-rupee coins are stacked together in a column at random. The probability that the coins of the same denomination are consecutive is

A. $13/9!$

B. $1/210$

C. $1/35$

D. none of these

Answer: B

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40. Two cards are drawn at random from a pack of 52 cards. The probability of getting at least a spade and an ace is

A. $1/34$

B. $8/221$

C. $\frac{1}{26}$

D. $2/51$

Answer: C

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41. A and B appear for an interview for two posts. The probability of A's section is $(1/3)$ and that of $B's$ selection is $(2/5)$. Find the probability that only one of them will be selected.

A. $7/15$

B. $8/15$

C. $2/15$

D. $4/15$

Answer: A

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42. Let S be the sample space of the random experiment of throwing simultaneously two unbiased dice with six faces (numbered 1 to 6) and let $E_k = \{(a, b) \in S : ab = k\}$ for $k \geq 1$ If $p_k = p(E_k)$ for $k \geq 1$ then correct among the following, is (Eamcet 2008)

A. $p_1 < p_{30} < p_4 < p_6$

B. $p_{36} < p_6 < p_2 < p_4$

C. $p_1 < p_{11} < p_4 < p_6$

D. $p_{36} < p_{11} < p_6 < p_4$

Answer: A

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43. For $k = 1, 2, 3$ the box B_k contains k red balls and $(k+1)$ white balls. Let $P(B_1) = \frac{1}{2}, P(B_2) = \frac{1}{3}$ and $P(B_3) = \frac{1}{6}$.A box is selected at random and a ball is drawn from it. If a red ball is drawn, then the probability that it has come from box B_2, is

A. $\frac{35}{78}$

B. $\frac{14}{39}$

C. $\frac{10}{13}$

D. $\frac{12}{13}$

Answer: B

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44. Four numbers are chosen at random from $\{1, 2, 3, \ldots\ldots, 40\}$. The probability that they are not consecutive is

A. $\frac{1}{2470}$

B. $\frac{4}{7969}$

C. $\frac{2469}{2470}$

D. $\frac{7965}{7969}$

Answer: C

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45. A number n is chosen at random from {1,2,3,..,1000}. The probability that n is a number which leaves a remainder 1 when divided by 7, is

A. $\frac{71}{580}$

B. $\frac{143}{1000}$

C. $\frac{72}{500}$

D. $\frac{71}{1000}$

Answer: B

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