



## MATHS

### BOOKS - DISHA PUBLICATION MATHS (HINGLISH)

#### PROBABILITY-1

##### Jee Main 5 Years At A Glance

1. Two different families A and B are blessed with equal number of children. There are 3 tickets to be distributed amongst the children of these families so that no child gets more than one ticket. If the probability that all the tickets go to children of the family B is  $\frac{1}{12}$  then the number of children in each family is :

A. 4

B. 6

C. 3

D. 5

**Answer: D**



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2. 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 :  $\frac{7}{64}$  (2)  $\frac{3}{16}$  (3)  $\frac{7}{32}$  (4)  $\frac{7}{16}$

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

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

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

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

**Answer: C**



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3. From a group of 10 men and 5 women, four member committees are to be formed each of which must contain at least one woman. Then the probability for these committees to have more women than men, is :

A.  $\frac{21}{220}$

B.  $\frac{3}{11}$

C.  $\frac{1}{11}$

D.  $\frac{2}{23}$

**Answer: C**



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4. If 12 identical balls are to be placed in 3 identical boxes, then the probability that one of the boxes contains exactly 3 balls is-

A.  $220 \left( \frac{1}{3} \right)^{12}$

B.  $22\left(\frac{1}{3}\right)^{11}$

C.  $\frac{55}{3}\left(\frac{2}{3}\right)^{11}$

D.  $55\left(\frac{2}{3}\right)^{10}$

**Answer: C**



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5. If the lengths of the sides of a triangle are decided by the three thrown of a single fair die, then the probability that the triangle is of maximum area given that it is an isosceles triangle, is

A.  $\frac{1}{27}$

B.  $\frac{1}{27}$

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

D.  $\frac{1}{26}$

**Answer: B**

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6. A set 'S' contains 7 elements. A non-empty subset A of S and an element 'x' of S are chosen at random. Then the probability that  $x \in A$  is

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

B.  $\frac{64}{127}$

C.  $\frac{63}{128}$

D.  $\frac{31}{128}$

**Answer: B**

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7. If A and B are two events such that  $P(A \cup B) = P(A \cap B)$ , then the incorrect statement amongst the following statements is :

A. A and B are equally likely

B.  $P(A \cap B') = 0$

C.  $P(A' \cap B) = 0$

D.  $P(A) + P(B) = 1$

**Answer: D**



**Watch Video Solution**

8. Two different families A and B are blessed with equal number of children. There are 3 tickets to be distributed amongst the children of these families so that no child gets more than one ticket. If the probability that all the tickets go to children of the family B is  $\frac{1}{12}$  then the number of children in each family is :

A. 4

B. 6

C. 3

D. 5

**Answer: D**



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9. 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 :  $\frac{7}{64}$  (2)  $\frac{3}{16}$  (3)  $\frac{7}{32}$  (4)  $\frac{7}{16}$

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

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

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

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

**Answer: C**



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10. From a group of 10 men and 5 women, four member committees are to be formed each of which must contain at least one woman. Then the probability for these committees to have more women than men, is :

A.  $\frac{21}{220}$

B.  $\frac{3}{11}$

C.  $\frac{1}{11}$

D.  $\frac{2}{23}$

**Answer: C**



**Watch Video Solution**

11. If 12 identical balls are to be placed in 3 identical boxes, then the probability that one of the boxes contains exactly 3 balls is :

A.  $220 \left( \frac{1}{3} \right)^{12}$

B.  $22 \left( \frac{1}{3} \right)^{11}$



C.  $55\left(\frac{2}{3}\right)^{11}$

D.  $55\left(\frac{2}{3}\right)^{10}$

**Answer: C**



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12. If the lengths of the sides of a triangle are decided by the three thrown of a single fair die, then the probability that the triangle is of maximum area given that it is an isosceles triangle, is

A.  $\frac{1}{27}$

B.  $\frac{1}{27}$

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

D.  $\frac{1}{26}$

**Answer: B**



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13. A set 'S' contains 7 elements. A non-empty subset A of S and an element 'x' of S are chosen at random. Then the probability that  $x \in A$  is

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

B.  $\frac{64}{127}$

C.  $\frac{63}{128}$

D.  $\frac{31}{128}$

**Answer: B**



**Watch Video Solution**

14. If A and B are two events such that  $P(A \cup B) = P(A \cap B)$ , then the incorrect statement amongst the following statements is :

A. A and B are equally likely

B.  $P(A \cap B') = 0$

C.  $P(A' \cap B) = 0$

D.  $P(A) + P(B) = 1$

**Answer: D**



**Watch Video Solution**

15. Two different families A and B are blessed with equal number of children. There are 3 tickets to be distributed amongst the children of these families so that no child gets more than one ticket. If the probability that all the tickets go to children of the family B is  $\frac{1}{12}$  then the number of children in each family is :

A. 4

B. 6

C. 3

D. 5

**Answer: D**

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16. For three events A, B and C,  $P(\text{Exactly one of A or B occurs})$

$= P(\text{Exactly one of B or C occurs})$

$= P(\text{Exactly one of C or A occurs}) = \frac{1}{4}$  and

$P(\text{All the three events occurs simultaneously}) = \frac{1}{16}$ .

Then the probability that at least one of the events occurs, is :

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

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

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

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

**Answer: C**

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17. From a group of 10 men and 5 women, four member committees are to be formed each of which must contain at least one woman. Then the probability for these committees to have more women than men, is :

A.  $\frac{21}{220}$

B.  $\frac{3}{11}$

C.  $\frac{1}{11}$

D.  $\frac{2}{23}$

**Answer: C**



**Watch Video Solution**

18. If 12 identical balls are to be placed in 3 identical boxes, then the probability that one of the boxes contains exactly 3 balls is :

A.  $220 \left( \frac{1}{3} \right)^{12}$

B.  $22 \left( \frac{1}{3} \right)^{11}$

C.  $\frac{55}{3} \left( \frac{2}{3} \right)^{11}$

D.  $55 \left( \frac{2}{3} \right)^{10}$

**Answer: C**



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19. If the lengths of the sides of a triangle are decided by the three thrown of a single fair die, then the probability that the triangle is of maximum area given that it is an isosceles triangle, is

A.  $\frac{1}{27}$

B.  $\frac{1}{27}$

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

D.  $\frac{1}{26}$

**Answer: B**



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20. A set 'S' contains 7 elements. A non-empty subset A of S and an element 'x' of S are chosen at random. Then the probability that  $x \in A$  is

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

B.  $\frac{64}{127}$

C.  $\frac{63}{128}$

D.  $\frac{31}{128}$

**Answer: B**



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21. If A and B are two events such that  $P(A \cup B) = P(A \cap B)$ , then the incorrect statement amongst the following statements is :

A. A and B are equally likely

B.  $P(A \cap B') = 0$

C.  $P(A' \cap B) = 0$

D.  $P(A) + P(B) = 1$

**Answer: D**



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### Exercise 1 Concept Builder

1. 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.  $1 - \frac{{}^{30}C_{10}}{30!}$

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

D. None of these

**Answer: C**



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2. A bag contains 4 brown and 5 white balls. A man pulls two balls at random without replacement. The probability that the man gets both the balls of the same colour is

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

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

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

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

**Answer: D**

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3.  $A$  and  $B$  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**



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4. Let  $\omega$  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  $\omega^{r_1} + \omega^{r_2} + \omega^{r_3} = 0$  is  $1/18$  b.  $1/9$  c.  $2/9$  d.  $1/36$

A.  $1/18$

B.  $1/9$

C.  $2/9$

D.  $1/36$

**Answer: C**



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

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

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

D. None of these

**Answer: A**



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

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

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

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

D. None of these

**Answer: D**



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7. 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.  $10^{10}$

C. 1

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

**Answer: A**



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8. 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.  $\frac{1}{20}$

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

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

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

**Answer: B**



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9. The probability that the two digit number formed by digits 1, 2, 3, 4, 5 is divisible by 4 is

A.  $\frac{1}{30}$

B.  $\frac{1}{20}$

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

D. None of these

**Answer: C**



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

A.  $65/648$

B.  $69/648$

C.  $73/648$

D.  $\frac{91}{648}$

**Answer: C**



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**11.** From 80 cards numbered 1 to 80, two cards are drawn at random. The probability that the cards have the numbers divisible by 4 is

A.  $\frac{21}{316}$

B.  $\frac{19}{316}$

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

D. None of these

**Answer: B**



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12. 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  $\frac{3}{34}$  b.  $\frac{17}{455}$  c.  $\frac{561}{15925}$  d. none of these

A.  $\frac{3}{34}$

B.  $\frac{17}{455}$

C.  $\frac{561}{15925}$

D. None of these

**Answer: C**



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13.  $x_1, x_2, x_3 \dots x_{50}$  are fifty real numbers such that  $x_r < x_{r+1}$  for  $r = 1, 2, 3, \dots, 49$ . Five numbers out of these are picked up at random. The probability that the five numbers have  $x_{20}$  as the middle number is :



A.  $\frac{{}^{20}C_2 \times {}^{30}C_2}{{}^{50}C_5}$

B.  $\frac{{}^{30}C_2 \times {}^{19}C_2}{{}^{50}C_5}$

C.  $\frac{{}^{19}C_2 \times {}^{31}C_2}{{}^{50}C_5}$

D. None of these

**Answer: B**



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**14.** The chance that the vowels are separated in an arrangement of the letters of the word HORROR is a.  $1/2$  b.  $2/3$  c.  $3/4$  d. none of these

A.  $1/2$

B.  $2/3$

C.  $3/4$

D. None of these

**Answer: B**

15. In four schools  $B_1, B_2, B_3, B_4$  the percentage of girls students is 12,20,13,17 respectively. From a school selected at random, one student is picked up at random and it is found that the student is a girl. The probability that the school selected is  $B_2$ , is

A.  $\frac{6}{31}$

B.  $\frac{10}{31}$

C.  $\frac{13}{62}$

D.  $\frac{17}{62}$

**Answer: B**

16. 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**



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17. 10 different books and 2 different pens are given to 3 boys so that each gets equal number of things. The probability that the same boy does not receive both the pens is

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

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

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

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

**Answer: A**



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**18.** 5 boys and 5 girls are sitting in a row randomly . The probability that boys and girls sits alternatively , is

A.  $1/462$

B.  $1/924$

C.  $1/2$

D. None of these

**Answer: A**



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19. Twelve balls are distribute among three boxes. The probability that the first box contains three balls is  $\frac{110}{9} \left(\frac{2}{3}\right)^{10}$  b.  $\frac{110}{9} \left(\frac{2}{3}\right)^{10}$  c.  $\frac{{}^{12}C_3}{12^3} \times 2^9$  d.  $\frac{{}^{12}C_3}{3^{12}}$

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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20. A complete cycle of a traffic light takes 60 s. During each cycle the light is green for 25 s, yellow for 5 s and red for 30 s. At a randomly chosen time, the probability that the light will not be green is

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

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

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

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

**Answer: D**



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**21.** Eight players  $P_1, P_2, P_3, \dots, P_8$ , play a knock out tournament. It is known that whenever the players  $P_i$  and  $P_j$ , play, the player  $P_i$  will win if  $i < j$ . Assuming that the players are paired at random in each round, what is the probability that the players  $P_4$ , reaches the final ?

A.  $31/35$

B.  $4/35$

C.  $8/35$

D. None of these

**Answer: B**



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**22.** Two integers are chosen at random and multiplied. Find the probability that the product is an even integer.

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

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

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

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

**Answer: B**



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**23.** 5 different games are to be distributed among 4 children randomly. The probability that each child gets atleast one game is

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

B.  $\frac{15}{64}$

C.  $\frac{21}{64}$

D. None of these

**Answer: B**



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**24.** 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  $\frac{1}{15}$  b.  $\frac{14}{15}$  c.  $\frac{1}{5}$  d.  $\frac{4}{5}$

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

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

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

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



**Answer: D**



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**25.** 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.  $\frac{1}{4}$

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

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

D. None of these

**Answer: A**



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**26.** Five dice are tossed. What is the probability that the five numbers shown will be different?

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

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

C.  $\frac{5}{27}$

D.  $\frac{5}{81}$

**Answer: A**



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27. If  $n$  integers taken at random are multiplied together, then the probability that the 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**



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**28.** The alphabets of word ALLAHABAD are arranged at random. The probability that in the words so formed, all identical alphabets are found together, is

A.  $1/63$

B.  $16/17$

C.  $5!/9!$

D. None of these

**Answer: A**



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29. Six dice are thrown. The probability that different numbers will turn up is equal to

A.  $\frac{129}{1296}$

B.  $\frac{1}{54}$

C.  $\frac{5}{324}$

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

**Answer: C**



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30. A dice is rolled three times, find the probability of getting a larger number than the previous number each time.

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

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

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

D. None of these

**Answer: B**



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**31.** If  $P(A) = 1/4$ ,  $P(B) = 2/5$  then find the range of  $P(A \cup B)$

A.  $(1/5, 13/20)$

B.  $(1/4, 13/20)$

C.  $(2/5, 13/20)$

D. None of these

**Answer: C**



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32. The probability of choosing a number divisible by 6 or 8 from among 1 to 90 is

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

B.  $\frac{1}{30}$

C.  $\frac{11}{80}$

D.  $\frac{23}{90}$

**Answer: D**



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33. If A, B, C are events such that  $P(A) = 0.3$ ,  $P(B) = 0.4$ ,  $P(C) = 0.8$ ,  $P(A \cap B) = 0.09$ ,  $P(A \cap C) = 0.28$ ,  $P(A \cap B \cap C) = 0.08$ . If  $P(A \cup B \cup C) \geq 0.75$  then  $P(B \cap C)$  lies in the interval

A.  $0.23 \leq x \leq 0.48$

B.  $0.23 \leq x \leq 0.47$

C.  $0.22 \leq x \leq 0.48$

D. None of these

**Answer: A**



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**34.** 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: C**



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35. In a given race the odds in favour of three horses A, B, C are 1 : 3, 1 : 4, 1 : 5 respectively. Assuming that dead head is impossible the probability that one of them wins is

A.  $\frac{7}{60}$

B.  $\frac{37}{60}$

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

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

**Answer: B**



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36. If E and F are events with  $P(E) \leq P(F)$  and  $P(E \cap F) > 0$ , then

A. occurrence of E implies occurrence of F

B. occurrence of F implies occurrence of E



C. non-occurrence of E implies non-occurrence of F

D. None of the above implications holds

**Answer: C**



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37. If the events A and B are mutually exclusive events such that  $P(A) = \frac{3x + 1}{3}$  and  $P(B) = \frac{1 - x}{4}$ , then the set of possible real values of x lies in the interval

A.  $[0, 1]$

B.  $\left[\frac{1}{3}, \frac{2}{3}\right]$

C.  $\left[-\frac{1}{3}, \frac{5}{9}\right]$

D.  $\left[-\frac{7}{9}, \frac{4}{9}\right]$

**Answer: C**



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**38.** Two events A and B have probabilities 0.25 and 0.5 respectively. The probabilities that A and B occur simultaneously is 0.15. Then the probability that A or B occurs is



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**39.** The probability that a card drawn from a pack of 52 cards will be a Diamond or a King is:- (a)  $\frac{2}{13}$  (b)  $\frac{4}{13}$  (c)  $\frac{1}{13}$  (d)  $\frac{1}{52}$

A.  $\frac{1}{52}$

B.  $\frac{2}{13}$

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

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

**Answer: C**



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40. 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 the these

**Answer: B**



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41. 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

**Answer: A**



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42. 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 show that  $P(B \cap C)$  satisfies

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

B.  $0.45 \leq P(B \cap C) \leq 0.75$

C.  $0.48 \leq P(B \cap C) \leq 0.75$

D. None of these

**Answer: A**

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43. 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.  $\left[\frac{1}{3}, \frac{1}{2}\right]$

C.  $\left[\frac{1}{3}, \frac{2}{3}\right]$

D.  $\left[\frac{1}{3}, \frac{13}{3}\right]$

**Answer: B**

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44. In a horse race the odds in favour of three horses are  $1 : 2$ ,  $1 : 3$  and  $1 : 4$ . The probability that one of the horse will win the race is

A.  $\frac{37}{60}$

B.  $\frac{47}{60}$

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

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

**Answer: B**



**Watch Video Solution**

**45.** A natural number  $x$  is chosen at random from the first one hundred natural numbers. The probability that  $\frac{(x - 20)(x - 40)}{(x - 30)} < 0$  is.  $\frac{1}{50}$  (2)

$\frac{3}{50}$  (3)  $\frac{7}{25}$  (4)  $\frac{9}{50}$  (5)  $\frac{5}{50}$

A.  $\frac{3}{25}$

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

C.  $\frac{7}{25}$

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

**Answer: C**



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**46.** If  $\frac{1+4p}{4}$ ,  $\frac{1-p}{3}$  and  $\frac{1-2p}{2}$  are the probabilities of three mutually exclusive events then values of  $p$  may be

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

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

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

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

**Answer: A**



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**47.** A die is rolled. Let  $E$  be the event die shows 4 and  $F$  be the event die shows even number. Are  $E$  and  $F$  mutually exclusive?

- A. Only I is true
- B. Only II is true
- C. Neither I nor II is true
- D. Both I and II are true

**Answer: B**



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**48.** A die is loaded in such a way that each odd number is twice as likely to occur as each even number. If E is the event of a number greater than or equal to 4 on a single toss of the die, then  $P(E)$  is :

- A.  $\frac{4}{9}$
- B.  $\frac{2}{3}$
- C.  $\frac{1}{2}$
- D.  $\frac{1}{3}$



**Answer: A**



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**49.** In a horse race, the probability that horse a can win is  $\frac{2}{5}$  and the probability that horse B can win is  $\frac{1}{4}$ . Find the probability that any one can win the race.

A.  $13/20$

B.  $9/20$

C.  $11/20$

D. None of these

**Answer: B**



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50. The probabilities of three events  $A$ ,  $B$ , and  $C$  are  $P(A) = 0.6$ ,  $P(B) = 0.4$ , and  $P(C) = 0.5$ . If  $P(A \cup B) = 0.8$ ,  $P(A \cap C) = 0.3$ ,  $P(A \cap B \cap C) = 0.2$ , and  $P(A \cup B \cup C) = 0.9$ , then find the range of  $P(B \cup C)$ .

A.  $(0.2, 0.35)$

B.  $[0.2, 0.35]$

C.  $(0.2, 0.35]$

D.  $[0.2, 0.35]$

**Answer: D**



**Watch Video Solution**

51. The probability of choosing a number divisible by 6 or 8 from among 1 to 90 is

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

B.  $\frac{1}{30}$

C.  $\frac{11}{80}$

D.  $\frac{23}{90}$

**Answer: D**



**Watch Video Solution**

**52.** The odds in favour of the occurrence of an event are 3:5. Find the probability of the non-occurrence of the event.

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

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

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

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

**Answer: D**



**Watch Video Solution**

53. A card is drawn at random from a pack of cards. What is the probability that the drawn card is neither a heart nor a king?

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

B.  $\frac{9}{13}$

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

D.  $\frac{13}{26}$

**Answer: B**



**Watch Video Solution**

54. In single cast with two dice the odds against drawing 7 is

A. 5

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

C. 6

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

**Answer: A**



**Watch Video Solution**

55. The probability that a company executive will travel by train is  $\frac{2}{3}$  and that he will travel by plane is  $\frac{1}{5}$ . The probability of his travelling by train or plane is (i)  $\frac{2}{15}$  (ii)  $\frac{13}{15}$  (iii)  $\frac{15}{13}$  (iv)  $\frac{15}{2}$

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

B.  $\frac{13}{15}$

C.  $\frac{15}{13}$

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

**Answer: B**



**Watch Video Solution**

56. The probability that a company executive will travel by train is  $\frac{2}{3}$  and that he will travel by plane is  $\frac{1}{5}$ . The probability of his travelling by train or plane is (i)  $\frac{2}{15}$  (ii)  $\frac{13}{15}$  (iii)  $\frac{15}{13}$  (iv)  $\frac{15}{2}$

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

B.  $\frac{13}{15}$

C.  $\frac{15}{13}$

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

**Answer: B**



**Watch Video Solution**

57. A positive integer  $N$  is selected so as to be  $100 < N < 200$ . Then, the probability that it is divisible by 4 or 7, is

A.  $\frac{38}{99}$

B.  $\frac{24}{99}$

C.  $\frac{34}{99}$

D.  $\frac{14}{99}$

**Answer: C**



**Watch Video Solution**

**58.** Card is drawn from a pack of 52 cards. A persons bets that it is a spade or an ace. What are the odds against him of winning this bet?

A. 17: 52

B. 52: 17

C. 9: 4

D. 4: 9

**Answer: C**



**Watch Video Solution**

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

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

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

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

**Answer: B**



**Watch Video Solution**

60. If  $P(B) = \frac{3}{4}$ ,  $P(A \cap B \cap \overline{C}) = \frac{1}{3}$  and  $P(\overline{A} \cap B \cap \overline{C}) = \frac{1}{3}$  then  $P(B \cap C) =$

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

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



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

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

**Answer: A**



**Watch Video Solution**

**61.** 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.  $1 - \frac{{}^{30}C_{10}}{30!}$

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

D. None of these

**Answer: C**



**Watch Video Solution**

62. A bag contains 4 brown and 5 white balls. A man pulls two balls at random without replacement. The probability that the man gets both the balls of the same colour is

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

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

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

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

**Answer: D**



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63. *A and B* 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**

**64.** Let  $\omega$  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  $\omega^{r_1} + \omega^{r_2} + \omega^{r_3} = 0$  is  $1/18$  b.  $1/9$  c.  $2/9$  d.  $1/36$

A.  $1/18$

B.  $1/9$

C.  $2/9$

D.  $1/36$

**Answer: C**

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

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

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

D. None of these

**Answer: A**

[Watch Video Solution](#)

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

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

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

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

D. None of these

**Answer: D**



**Watch Video Solution**

**67.** 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.  $10^{10}$

C. 1

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

**Answer: A**

**68.** A natural number  $n$  is selected at random from the first 100 natural numbers (i.e., 1 to 100). The probability that  $\left(n + \frac{100}{n} > 50\right)$  is

A.  $\frac{1}{20}$

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

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

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

**Answer: B**

**69.** The probability that the two digit number formed by digits 1, 2, 3, 4, 5 is divisible by 4 is

A.  $\frac{1}{30}$

B.  $\frac{1}{20}$

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

D. None of these

**Answer: C**



**View Text Solution**

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

A.  $\frac{65}{648}$

B.  $\frac{69}{648}$

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

D.  $\frac{91}{648}$

**Answer: C**



**Watch Video Solution**

71. From 80 cards numbered 1 to 80, two cards are drawn at random. The probability that the cards have the numbers divisible by 4 is

A.  $\frac{21}{316}$

B.  $\frac{19}{316}$

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

D. None of these

**Answer: B**



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72. 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  $\frac{3}{34}$  b.  $\frac{17}{455}$  c.  $\frac{561}{15925}$  d. none of these



A.  $3/34$

B.  $17/455$

C.  $561/15925$

D. None of these

**Answer: C**



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**73.**  $x_1, x_2, x_3 \dots x_{50}$  are fifty real numbers such that  $x_r < x_{r+1}$  for  $r = 1, 2, 3, \dots, 49$ . Five numbers out of these are picked up at random. The probability that the five numbers have  $x_{20}$  as the middle number is :

A.  $\frac{{}^{20}C_2 \times {}^{30}C_2}{{}^{50}C_5}$

B.  $\frac{{}^{30}C_2 \times {}^{19}C_2}{{}^{50}C_5}$

C.  $\frac{{}^{19}C_2 \times {}^{31}C_2}{{}^{50}C_5}$

D. None of these

**Answer: B**



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**74.** The chance that the vowels are separated in an arrangement of the letters of the word HORROR is a.  $1/2$  b.  $2/3$  c.  $3/4$  d. none of these

A.  $1/2$

B.  $2/3$

C.  $3/4$

D. None of these

**Answer: B**



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**75.** In four schools  $B_1, B_2, B_3, B_4$  the percentage of girls students is 12, 20, 13, 17 respectively. From a school selected at random, one student is

picked up at random and it is found that the student is a girl. The probability that the school selected is  $B_2$ , is

A.  $\frac{6}{31}$

B.  $\frac{10}{31}$

C.  $\frac{13}{62}$

D.  $\frac{17}{62}$

**Answer: B**



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**76.** 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.  $1/4$

B.  $1/7$

C.  $1/8$

**Answer: A**



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77. 10 different books and 2 different pens are given to 3 boys so that each gets equal number of things. The probability that the same boy does not receive both the pens is

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

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

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

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

**Answer: A**



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78. Six boys and six girls sit in a row randomly. Find the probability that (i) the six girls sit together, (ii) the boys and girls sit alternately.

A.  $1/462$

B.  $1/924$

C.  $1/2$

D. None of these

**Answer: A**



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79. Twelve balls are distribute among three boxes. The probability that the first box contains three balls is  $\frac{110}{9} \left(\frac{2}{3}\right)^{10}$  b.  $\frac{110}{9} \left(\frac{2}{3}\right)^{10}$  c.

$\frac{{}^{(12)}C_3}{12^3} \times 2^9$  d.  $\frac{{}^{(12)}C_3}{3^{12}}$

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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**80.** A complete cycle of a traffic light takes 60 s. During each cycle the light is green for 25 s, yellow for 5 s and red for 30 s. At a randomly chosen time, the probability that the light will not be green is

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

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

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

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

**Answer: D**



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81. Eight players  $P_1, P_2, P_3, \dots, P_8$ , play a knock out tournament. It is known that whenever the players  $P_i$  and  $P_j$ , play, the player  $P_i$  will win if  $i < j$ . Assuming that the players are paired at random in each round, what is the probability that the players  $P_4$ , reaches the final ?

- A.  $\frac{31}{35}$
- B.  $\frac{4}{35}$
- C.  $\frac{8}{35}$
- D. None of these

**Answer: B**



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82. Two integers are chosen at random and multiplied. Find the probability that the product is an even integer.

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

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

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

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

**Answer: B**



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**83.** 5 different games are to be distributed among 4 children randomly.

The probability that each child gets atleast one game is

A.  $1/4$

B.  $\frac{15}{64}$

C.  $21/64$

D. None of these

**Answer: B**



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**84.** 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  $\frac{1}{15}$  b.  $\frac{14}{15}$  c.  $\frac{1}{5}$  d.  $\frac{4}{5}$

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

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

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

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

**Answer: D**



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**85.** 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.  $\frac{1}{4}$

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

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

D. None of these

**Answer: A**



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**86.** Five dice are tossed. What is the probability that the five numbers shown will be different?

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

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

C.  $\frac{5}{27}$

D.  $\frac{5}{81}$

**Answer: A**



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87. If  $n$  integers taken at random are multiplied together, then the probability that the 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**



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88. The alphabets of word ALLAHABAD are arranged at random. The probability that in the words so formed, all identical alphabets are found together, is

A.  $1/63$

B.  $16/17$

C.  $5!/9!$

D. None of these

**Answer: A**



**View Text Solution**

**89.** Six dice are thrown. The probability that different numbers will turn up is equal to

A.  $\frac{129}{1296}$

B.  $\frac{1}{54}$

C.  $\frac{5}{324}$

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

**Answer: C**

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90. A dice is rolled three times, find the probability of getting a larger number than the previous number each time.

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

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

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

D. None of these

**Answer: B**

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91. If  $P(A) = 1/4$ ,  $P(B) = 2/5$  then find the range of  $P(A \cup B)$

A.  $(1/5, 13/20)$

B.  $(1/4, 13/20)$

C.  $(\frac{2}{5}, \frac{13}{20})$

D. None of these

**Answer: C**



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**92.** The probability of choosing a number divisible by 6 or 8 from among 1 to 90 is

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

B.  $\frac{1}{30}$

C.  $\frac{11}{80}$

D.  $\frac{23}{90}$

**Answer: D**



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93. A, B and C are events associated with a random experiment such that

$$P(A) = 0.3,$$

$$P(B) = 0.4, \quad P(C) = 0.8, \quad P(A \cap B) = 0.08, \quad P(A \cap C) = 0.28 \quad \text{and}$$

$$P(A \cap B \cap C) = 0.09. \text{ If}$$

$P(A \cup B \cup C) \geq 0.75$  Then prove that  $P(B \cap C)$  lies in the interval  $[0.23, 0.48]$ .

A.  $0.23 \leq x \leq 0.48$

B.  $0.23 \leq x \leq 0.47$

C.  $0.22 \leq x \leq 0.48$

D. None of these

**Answer: A**



**Watch Video Solution**

94. 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: C**



**Watch Video Solution**

**95.** In a given race the odds in favour of three horses A, B, C are 1 : 3, 1 : 4, 1 : 5 respectively. Assuming that dead head is impossible the probability that one of them wins is

A.  $\frac{7}{60}$

B.  $\frac{37}{60}$

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



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

**Answer: B**



**View Text Solution**

**96.** If E and F are events with  $P(E) \leq P(F)$  and  $P(E \cap F) > 0$ , then

- A. occurrence of E implies occurrence of F
- B. occurrence of F implies occurrence of E
- C. non-occurrence of E implies non-occurrence of F
- D. None of the above implications holds

**Answer: d**



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97. If the events A and B are mutually exclusive events such that  $P(A) = \frac{3x + 1}{3}$  and  $P(B) = \frac{1 - x}{4}$ , then the set of possible real values of x lies in the interval

A.  $[0, 1]$

B.  $\left[\frac{1}{3}, \frac{2}{3}\right]$

C.  $\left[-\frac{1}{3}, \frac{5}{9}\right]$

D.  $\left[-\frac{7}{9}, \frac{4}{9}\right]$

**Answer: C**



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98. Two events A and B have probabilities 0.25 and 0.5 respectively. The probabilities that A and B occur simultaneously is 0.15. Then the probability that A or B occurs is



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99. The probability that a card drawn from a pack of 52 cards will be a Diamond or a King is:- (a)  $\frac{2}{13}$  (b)  $\frac{4}{13}$  (c)  $\frac{1}{13}$  (d)  $\frac{1}{52}$

A.  $\frac{1}{52}$

B.  $\frac{2}{13}$

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

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

**Answer: C**



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100. 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 the these

**Answer: B**



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**101.** 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

**Answer: A**



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102. 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 show that  $P(B \cap C)$  satisfies

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

B.  $0.45 \leq P(B \cap C) \leq 0.75$

C.  $0.48 \leq P(B \cap C) \leq 0.75$

D. None of these

**Answer: A**



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103. 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.  $\left[\frac{1}{3}, \frac{1}{2}\right]$

C.  $\left[\frac{1}{3}, \frac{2}{3}\right]$

D.  $\left[\frac{1}{3}, \frac{13}{3}\right]$

**Answer: B**



**Watch Video Solution**

**104.** In a horse race the odds in favour of three horses are 1 : 2, 1 : 3 and 1 :

4. The probability that one of the horse will win the race is

A.  $\frac{37}{60}$

B.  $\frac{47}{60}$

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

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

**Answer: B**



**Watch Video Solution**

**105.** Statement-1: A natural  $x$  is chosen at random from the first 100 natural numbers. The probability that

$$\frac{(x - 10)(x - 50)}{x - 30} < 0 \text{ is } 0.28$$

Statement-2 : For any event  $A$ ,  $0 \leq P(A) \leq 1$ .

A.  $\frac{3}{25}$

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

C.  $\frac{7}{25}$

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

**Answer: C**



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**106.** If  $\frac{1 + 4p}{4}$ ,  $\frac{1 - p}{3}$  and  $\frac{1 - 2p}{2}$  are the probabilities of three mutually exclusive events then values of  $p$  may be

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

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

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

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

**Answer: A**



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**107.** A die is rolled. Let E be the event die shows 4 and F be the event die shows even number. Are E and F mutually exclusive?

A. Only I is true

B. Only II is true

C. Neither I nor II is true

D. Both I and II are true

**Answer: B**



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**108.** A die is loaded in such a way that each odd number is twice as likely to occur as each even number. If  $E$  is the event of a number greater than or equal to 4 on a single toss of the die, then  $P(E)$  is :

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

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

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

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

**Answer: A**

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**109.** Amar and Bimal are two contestants for an election, probability that Amar will win is  $\frac{1}{4}$  and that Bimal will win the election is  $\frac{1}{5}$ , then what is probability that either Amar or Bimal will win the election.

A.  $13/20$

B.  $9/20$

C.  $11/20$

D. None of these

**Answer: B**



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**110.** The probabilities of three events  $A$ ,  $B$ , and  $C$  are

$P(A) = 0.6$ ,  $P(B) = 0.4$ , and  $P(C) = 0.5$ . If

$P(A \cup B) = 0.8$ ,  $P(A \cap C) = 0.3$ ,  $P(A \cap B \cap C) = 0.2$ , and  $P(A \cup B \cup C) = 0.9$ ,

then find the range of  $P(B \cup C)$ .

A.  $(0.2, 0.35)$

B.  $[0.2, 0.35]$

C.  $(0.2, 0.35]$

D.  $[0.2, 0.35]$

**Answer: D**



**Watch Video Solution**

**111.** The probability of choosing a number divisible by 6 or 8 from among 1 to 90 is

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

B.  $\frac{1}{30}$

C.  $\frac{11}{80}$

D.  $\frac{23}{90}$

**Answer: D**



**Watch Video Solution**

**112.** The odds in favour of the occurrence of an event are 3:5. Find the probability of the non-occurrence of the event.

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

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

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

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

**Answer: D**



**Watch Video Solution**

**113.** A card is drawn at random from a pack of cards. What is the probability that the drawn card is neither a heart nor a king?

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

B.  $\frac{9}{13}$

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

D.  $\frac{13}{26}$

**Answer: B**

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**114.** In a single throw of two dice, the probability of getting a total of 7 or 9 is

A. 5

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

C. 6

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

**Answer: A**

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**115.** The probability that a company executive will travel by train is  $\frac{2}{3}$  and that he will travel by plane is  $\frac{1}{5}$ . The probability of his travelling by train or plane is (i)  $\frac{2}{15}$  (ii)  $\frac{13}{15}$  (iii)  $\frac{15}{13}$  (iv)  $\frac{15}{2}$

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

B.  $\frac{13}{15}$

C.  $\frac{15}{13}$

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

**Answer: B**



**Watch Video Solution**

**116.** The probability that a company executive will travel by train is  $\frac{2}{3}$  and that he will travel by plane is  $\frac{1}{5}$ . The probability of his travelling by train or plane is (i)  $\frac{2}{15}$  (ii)  $\frac{13}{15}$  (iii)  $\frac{15}{13}$  (iv)  $\frac{15}{2}$

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

B.  $\frac{13}{15}$

C.  $\frac{15}{13}$

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

**Answer: B**



**Watch Video Solution**

**117.** A positive integer  $N$  is selected so as to be  $100 < N < 200$ . Then, the probability that it is divisible by 4 or 7, is

A.  $\frac{38}{99}$

B.  $\frac{24}{99}$

C.  $\frac{34}{99}$

D.  $\frac{14}{99}$

**Answer: C**



**Watch Video Solution**

**118.** Card is drawn from a pack of 52 cards. A persons bets that it is a spade or an ace. What are the odds against him of winning this bet?

A. 17: 52

B. 52: 17

C. 9: 4

D. 4: 9

**Answer: C**



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**119.** 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.  $\frac{1}{3}$

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

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

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



**Answer: B**



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

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

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

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

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

**Answer: A**



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**121.** 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.  $1 - \frac{{}^{30}C_{10}}{30!}$

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

D. None of these

**Answer: C**



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**122.** A bag contains 4 brown and 5 white balls. A man pulls two balls at random without replacement. The probability that the man gets both the balls of the same colour is

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

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

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

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

**Answer: D**



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**123.** *A and B* 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**



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**124.** Let  $\omega$  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  $\omega^{r_1} + \omega^{r_2} + \omega^{r_3} = 0$  is  $1/18$  b.  $1/9$  c.  $2/9$  d.  $1/36$

A.  $1/18$

B.  $1/9$

C.  $2/9$

D.  $1/36$

**Answer: C**



**Watch Video Solution**

**125.** 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.  $\frac{5}{12}$

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

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

D. None of these

**Answer: A**



**Watch Video Solution**

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

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

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

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

D. None of these

**Answer: D**



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127. 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.  $10^{10}$

C. 1

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

**Answer: A**



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128. 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.  $\frac{1}{20}$

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

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

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

**Answer: B**



**Watch Video Solution**

**129.** The probability that the two digit number formed by digits 1, 2, 3, 4, 5 is divisible by 4 is

A.  $\frac{1}{30}$

B.  $\frac{1}{20}$

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

D. None of these

**Answer: C**



**Watch Video Solution**

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

A.  $\frac{65}{648}$

B.  $\frac{69}{648}$

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

D.  $\frac{91}{648}$

**Answer: C**



**Watch Video Solution**

**131.** From 80 cards numbered 1 to 80, two cards are drawn at random. The probability that the cards have the numbers divisible by 4 is

A.  $\frac{21}{316}$

B.  $\frac{19}{316}$



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

D. None of these

**Answer: B**



**Watch Video Solution**

**132.** 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  $\frac{3}{34}$  b.  $\frac{17}{455}$  c.  $\frac{561}{15925}$  d. none of these

A.  $\frac{3}{34}$

B.  $\frac{17}{455}$

C.  $\frac{561}{15925}$

D. None of these

**Answer: C**



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133.  $x_1, x_2, x_3 \dots x_{50}$  are fifty real numbers such that  $x_r < x_{r+1}$  for  $r = 1, 2, 3, \dots, 49$ . Five numbers out of these are picked up at random. The probability that the five numbers have  $x_{20}$  as the middle number is :

A.  $\frac{{}^{20}C_2 \times {}^{30}C_2}{{}^{50}C_5}$

B.  $\frac{{}^{30}C_2 \times {}^{19}C_2}{{}^{50}C_5}$

C.  $\frac{{}^{19}C_2 \times {}^{31}C_2}{{}^{50}C_5}$

D. None of these

Answer: B



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134. The chance that the vowels are separated in an arrangement of the letters of the word HORROR is a.  $1/2$  b.  $2/3$  c.  $3/4$  d. none of these

A.  $1/2$

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

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

D. None of these

**Answer: B**



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**135.** In four schools  $B_1, B_2, B_3, B_4$  the percentage of girls students is 12,20,13,17 respectively. From a school selected at random, one student is picked up at random and it is found that the student is a girl. The probability that the school selected is  $B_2$ , is

A.  $\frac{6}{31}$

B.  $\frac{10}{31}$

C.  $\frac{13}{62}$

D.  $\frac{17}{62}$

**Answer: B**



**Watch Video Solution**

**136.** 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**



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**137.** 10 different books and 2 different pens are given to 3 boys so that each gets equal number of things. The probability that the same boy does not receive both the pens is

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

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

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

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

**Answer: A**



**Watch Video Solution**

**138.** Six boys and six girls sit in a row randomly. Find the probability that (i) the six girls sit together, (ii) the boys and girls sit alternately.

A.  $1/462$

B.  $1/924$

C.  $1/2$

D. None of these

**Answer: A**



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**139.** Twelve balls are distribute among three boxes. The probability that

the first box contains three balls is  $\frac{110}{9} \left(\frac{2}{3}\right)^{10}$  b.  $\frac{110}{9} \left(\frac{2}{3}\right)^{10}$  c.

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

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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**140.** A complete cycle of a traffic light takes 60 s. During each cycle the light is green for 25 s, yellow for 5 s and red for 30 s. At a randomly chosen time, the probability that the light will not be green is

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

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

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

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

**Answer: D**



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**141.** Eight players  $P_1, P_2, P_3, \dots, P_8$ , play a knock out tournament. It is known that whenever the players  $P_i$  and  $P_j$ , play, the player  $P_i$  will win if  $i < j$ . Assuming that the players are paired at random in each round, what is the probability that the players  $P_4$ , reaches the final ?

A.  $31/35$

B.  $4/35$

C.  $8/35$

D. None of these

**Answer: B**



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**142.** Two integers are chosen at random and multiplied. Find the probability that the product is an even integer.

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

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

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

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

**Answer: B**



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**143.** 5 different games are to be distributed among 4 children randomly.

The probability that each child gets atleast one game is

A.  $1/4$

B.  $\frac{15}{64}$

C.  $21/64$

D. None of these

**Answer: B**

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**144.** 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**



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**145.** 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.  $\frac{1}{4}$

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

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

D. None of these

**Answer: A**

**146.** Five dice are tossed. What is the probability that the five numbers shown will be different?

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

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

C.  $\frac{5}{27}$

D.  $\frac{5}{81}$

**Answer: A**

**147.** If  $n$  integers taken at random are multiplied together, then the probability that the 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**



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**148.** The alphabets of word ALLAHABAD are arranged at random. The probability that in the words so formed, all identical alphabets are found together, is

A.  $1/63$

B.  $16/17$

C.  $5!/9!$

D. None of these

**Answer: A**



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**149.** Six dice are thrown. The probability that different numbers will turn up is equal to

A.  $\frac{129}{1296}$

B.  $\frac{1}{54}$

C.  $\frac{5}{324}$

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

**Answer: C**



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**150.** A dice is rolled three times, find the probability of getting a larger number than the previous number each time.

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

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

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

D. None of these

**Answer: B**



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**151.** If  $P(A) = 1/4$ ,  $P(B) = 2/5$  then find the range of  $P(A \cup B)$

A.  $(1/5, 13/20)$

B.  $(1/4, 13/20)$

C.  $(2/5, 13/20)$

D. None of these

**Answer: C**



**View Text Solution**

**152.** The probability of choosing a number divisible by 6 or 8 from among 1 to 90 is

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

B.  $\frac{1}{30}$

C.  $\frac{11}{80}$

D.  $\frac{23}{90}$

**Answer: D**



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**153.** If A, B, C are events such that  $P(A) = 0.3$ ,  $P(B) = 0.4$ ,  $P(C) = 0.8$

$$P(A \cap B) = 0.08, P(A \cap C) = 0.28$$

$$P(A \cap B \cap C) = 0.09$$

If  $P(A \cup B \cup C) \geq 0.75$ , then find the range of  $x = P(B \cap C)$  lies in the interval.

A.  $0.23 \leq x \leq 0.48$

B.  $0.23 \leq x \leq 0.47$

C.  $0.22 \leq x \leq 0.48$

D. None of these

**Answer: A**



**Watch Video Solution**

**154.** 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: C**



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**155.** In a given race the odds in favour of three horses A, B, C are 1 : 3, 1 : 4, 1 : 5 respectively. Assuming that dead head is impossible the probability that one of them wins is

A.  $\frac{7}{60}$

B.  $\frac{37}{60}$

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

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

**Answer: B**



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**156.** If E and F are events with  $P(E) \leq P(F)$  and  $P(E \cap F) > 0$ , then

- A. occurrence of E implies occurrence of F
- B. occurrence of F implies occurrence of E
- C. non-occurrence of E implies non-occurrence of F
- D. None of the above implications holds

**Answer: D**



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**157.** If the events A and B are mutually exclusive events such that  $P(A) = \frac{3x + 1}{3}$  and  $P(B) = \frac{1 - x}{4}$ , then the set of possible real values of x lies in the interval

- A.  $[0, 1]$
- B.  $\left[\frac{1}{3}, \frac{2}{3}\right]$
- C.  $\left[-\frac{1}{3}, \frac{5}{9}\right]$
- D.  $\left[-\frac{7}{9}, \frac{4}{9}\right]$

**Answer: C**



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**158.** Two events A and B have probabilities 0.25 and 0.5 respectively. The probabilities that A and B occur simultaneously is 0.15. Then the probability that A or B occurs is



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**159.** The probability that a card drawn from a pack of 52 cards will be a Diamond or a King is:- (a)  $\frac{2}{13}$  (b)  $\frac{4}{13}$  (c)  $\frac{1}{13}$  (d)  $\frac{1}{52}$

A.  $\frac{1}{52}$

B.  $\frac{2}{13}$

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

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

**Answer: C**



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**160.** 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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161. 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

**Answer: A**



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162. Let  $A, B, C$  be three events such that  $P(A) = 0.3, P(B) = 0.4, P(C) = 0.8, P(A \cap B) = 0.88, P(A \cap C) = 0.88$ . If  $P(A \cup B \cup C) \geq 0.75$ , then show that  $0.23 \leq P(B \cap C) \leq 0.48$ .

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

B.  $0.45 \leq P(B \cap C) \leq 0.75$

C.  $0.48 \leq P(B \cap C) \leq 0.75$

D. None of these

**Answer: A**



**Watch Video Solution**

**163.** 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.  $\left[\frac{1}{3}, \frac{1}{2}\right]$

C.  $\left[\frac{1}{3}, \frac{2}{3}\right]$

D.  $\left[\frac{1}{3}, \frac{13}{3}\right]$

**Answer: B**

[Watch Video Solution](#)

**164.** In a horse race the odds in favour of three horses are 1 : 2, 1 : 3 and 1 :

4. The probability that one of the horse will win the race is

A.  $\frac{37}{60}$

B.  $\frac{47}{60}$

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

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

**Answer: B**

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**165.** A natural number  $x$  is chosen at random from the first one hundred

natural numbers. The probability that  $\frac{(x - 20)(x - 40)}{(x - 30)} < 0$  is.  $\frac{1}{50}$  (2)

$\frac{3}{50}$  (3)  $\frac{7}{25}$  (4)  $\frac{9}{50}$  (5)  $\frac{5}{50}$

A.  $\frac{3}{25}$

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

C.  $\frac{7}{25}$

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

**Answer: C**



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**166.** If  $\frac{1 + 4p}{4}$ ,  $\frac{1 - p}{3}$  and  $\frac{1 - 2p}{2}$  are the probabilities of three mutually exclusive events then values of  $p$  may be

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

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

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

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

**Answer: A**



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**167.** A die is rolled. Let  $E$  be the event die shows 4 and  $F$  be the event die shows even number. Are  $E$  and  $F$  mutually exclusive?

- A. Only I is true
- B. Only II is true
- C. Neither I nor II is true
- D. Both I and II are true

**Answer: B**

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**168.** A die is loaded in such a way that each odd number is twice as likely to occur as each even number. If  $E$  is the event of a number greater than or equal to 4 on a single toss of the die, then  $P(E)$  is :

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

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

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

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

**Answer: A**



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**169.** Amar and Bimal are two contestants for an election, probability that Amar will win is  $\frac{1}{4}$  and that Bimal will win the election is  $\frac{1}{5}$ , then what is probability that either Amar or Bimal will win the election.

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

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

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

D. None of these

**Answer: B**



**Watch Video Solution**

**170.** The probabilities of three events  $A$ ,  $B$ , and  $C$  are  $P(A) = 0.6$ ,  $P(B) = 0.4$ , and  $P(C) = 0.5$ . If

$P(A \cup B) = 0.8$ ,  $P(A \cap C) = 0.3$ ,  $P(A \cap B \cap C) = 0.2$ , and  $P(A \cup B \cup C)$

then find the range of  $P(B \cup C)$ .

A.  $(0.2, 0.35)$

B.  $[0.2, 0.35]$

C.  $(0.2, 0.35]$

D.  $[0.2, 0.35]$

**Answer: D**



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171. The probability of choosing at random a number divisible by 6 or 8 from among 1 to 90 is

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

B.  $\frac{1}{30}$

C.  $\frac{11}{80}$

D.  $\frac{23}{90}$

**Answer: D**



**Watch Video Solution**

172. The odds in favour of the occurrence of an event are 3:5. Find the probability of the non-occurrence of the event.

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

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

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

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

**Answer: D**



**Watch Video Solution**

**173.** A card is drawn at random from a pack of cards. What is the probability that the drawn card is neither a heart nor a king?

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

B.  $\frac{9}{13}$

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

D.  $\frac{13}{26}$

**Answer: B**



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**174.** In a single throw of two dice, the probability of getting a total of 7 or 9 is

A. 5

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

C. 6

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

**Answer: A**



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**175.** The probability that a company executive will travel by train is  $\frac{2}{3}$  and that he will travel by plane is  $\frac{1}{5}$ . The probability of his travelling by train or plane is (i)  $\frac{2}{15}$  (ii)  $\frac{13}{15}$  (iii)  $\frac{15}{13}$  (iv)  $\frac{15}{2}$

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

B.  $\frac{13}{15}$

C.  $\frac{15}{13}$

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

**Answer: B**



**Watch Video Solution**

**176.** The probability that a company executive will travel by train is  $\frac{2}{3}$  and that he will travel by plane is  $\frac{1}{5}$ . The probability of his travelling by train or plane is (i)  $\frac{2}{15}$  (ii)  $\frac{13}{15}$  (iii)  $\frac{15}{13}$  (iv)  $\frac{15}{2}$

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

B.  $\frac{13}{15}$

C.  $\frac{15}{13}$

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

**Answer: B**



**Watch Video Solution**

177. A positive integer  $N$  is selected so as to be  $100 < N < 200$ . Then, the probability that it is divisible by 4 or 7, is

A.  $\frac{38}{99}$

B.  $\frac{24}{99}$

C.  $\frac{34}{99}$

D.  $\frac{14}{99}$

**Answer: C**



**Watch Video Solution**

178. Card is drawn from a pack of 52 cards. A persons bets that it is a spade or an ace. What are the odds against him of winning this bet?

A. 17: 52

B. 52: 17



C. 9:4

D. 4:9

**Answer: C**



**Watch Video Solution**

**179.** 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.  $\frac{1}{3}$

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

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

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

**Answer: B**



**Watch Video Solution**

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

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

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

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

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

**Answer: A**



**Watch Video Solution**

### Exercise 2 Concept Applicator

1. In a game called odd man out  $m(m > 2)$  persons toss a coin to determine who will buy refreshments for the entire group. A person who gets an outcome different from that of the rest of the members of the

group is called the odd man out. The probability that there is a loser in any game is  $1/2m$  b.  $m/2^{m-1}$  c.  $2/m$  d. none of these

A.  $1/2m$

B.  $m/2^{m-1}$

C.  $2/m$

D. None of these

**Answer: B**



**Watch Video Solution**

2. If  $a$  and  $b$  are chosen randomly from the set consisting of number 1, 2, 3, 4, 5, 6 with replacement. Then the probability that

$$\lim_{x \rightarrow 0} [(a^x + b^x)/2]^{2/x} = 6 \text{ is}$$

A.  $1/3$

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

C.  $1/9$

**Answer: C**



**Watch Video Solution**

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

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

D. None of these

**Answer: B**



**Watch Video Solution**

4. A die is rolled three times. The probability that the sum of three numbers obtained is 15, is equal to

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

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

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

D.  $\frac{7}{108}$

**Answer: A**



**Watch Video Solution**

5. When three cards are drawn at random from a well shuffled pack of cards, then what is the probability that all of them are from the different suits?

A.  $\frac{{}^{13}C_3}{{}^{52}C_3}$

B.  $\frac{4 \cdot ({}^{13}C_1 {}^{13}C_1 {}^{13}C_1)}{{}^{52}C_3}$

C.  $\frac{{}^3P_3 {}^{13}C_3 {}^{13}C_1 {}^{13}C_1}{{}^{52}C_3}$

D. None of these

**Answer: B**



**View Text Solution**

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

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

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

D. None of these

**Answer: A**



**Watch Video Solution**

7. Fifteen coupons are numbered 1, 2, 3,..., 15 respectively. Seven coupons are selected random one at a time with replacement. The probability that the largest number appearing on the selected coupons is atmost 9, is :

A.  $(9/16)^6$

B.  $(8/15)^7$

C.  $(3/5)^7$

D. None of these

**Answer: D**



**Watch Video Solution**

8. A coin is tossed three times. The probability of getting head and tail alternately, is

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

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

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

D. None of these

**Answer: C**



**Watch Video Solution**

**9. Statement-1 :** Three natural number are taken at random from the set  $A = \{x : 1 < x \leq 100, x \in N\}$  the probability that the A.M of the numbers taken is 25 is equal to  $\frac{{}^{74}C_2}{{}^{100}C_3}$ .

**Statement-2 :** Let  $A = \{2, 3, 4 \dots 20\}$ . A number is chosen at random from set A and it is bound to be a prime number. The probability that it is more than 10 is  $\frac{1}{5}$ .

**Statement-3 :** The probability of three person having the same date month for the birthday is  $\frac{1}{(365)^2}$ .

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**



**Watch Video Solution**

**10.** A die is loaded so that the probability of a face  $i$  is proportional to  $i$ ,  $i = 1, 2, 6$ . Then find the probability of an even number occurring when the die is rolled.

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

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

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

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

**Answer: D**

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11. If two numbers  $p$  and  $q$  are chosen randomly from the set  $\{1, 2, 3, 4\}$  with replacement, then the probability that  $p^2 \geq 4q$  is equal to

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

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

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

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

**Answer: D**

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12. 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.  $\frac{1}{20}$

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

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

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

**Answer: B**



**Watch Video Solution**

**13.** If two dice are thrown simultaneously, then the probability that the sum of the numbers which come upon the dice to be more than 5 is

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

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

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

D.  $\frac{13}{18}$

**Answer: D**

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14. Given that  $n$  is odd, number of ways in which three numbers in AP can be selected from  $1, 2, 3, \dots, n$ , is

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

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

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

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

**Answer: D**

[Watch Video Solution](#)

15. A fair coin is tossed  $2n$  times. The probability of getting as many heads in the first  $n$  tosses as in the last  $n$  is

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

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

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

D. None of these

**Answer: A**



**View Text Solution**

**16.** A bag contains 8 red and 7 black balls. Two balls are drawn at random.

The probability that both the balls are of the same colour is :

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

B.  $\frac{11}{15}$

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

D.  $\frac{4}{15}$

**Answer: C**



**Watch Video Solution**

17. If A and B are any two events such that  $P(A \cup B) = \frac{3}{4}$ ,  $P(A \cap B) = \frac{1}{4}$  and  $P(\bar{A}) = \frac{2}{3}$ , where  $\bar{A}$  stands for the complementary event of A, then what is  $P(B)$  ?

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

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

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

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

**Answer: B**



**Watch Video Solution**

18. Let  $A, B, C$  be three events. If the probability of occurring exactly one event out of  $A$  and  $B$  is  $1 - x$ , out of  $B$  and  $C$  is  $1 - 2x$ , out of  $C$  and  $A$  is  $1 - x$ , and that of occurring three events simultaneously is  $x^2$ ,

then prove that the probability that atleast one out of A, B, C will occur is greaer than  $\frac{1}{2}$  .

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

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

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

D. None of these

**Answer: C**



**Watch Video Solution**

**19.** 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 (1)  $\frac{3}{5}$  (2) 0 (3) 1 (4)  $\frac{2}{5}$

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

B. 0

C. 1

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

**Answer: C**



**Watch Video Solution**

**20.** Card is drawn from a pack of 52 cards. A persons bets that it is a spade or an ace. What are the odds against him of winning this bet?

A. 17: 52

B. 52: 17

C. 9: 4

D. 4: 9

**Answer: C**



**Watch Video Solution**



21. 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.  $\frac{15}{18}$

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

C.  $\frac{11}{18}$

D.  $\frac{17}{18}$

**Answer: B**



**Watch Video Solution**

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

B.  $P(A \cap B') \geq \frac{1}{3}$

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

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

**Answer: B**



**Watch Video Solution**

**23.** An experiment yield 3 mutually exclusive and exhaustive events A,B, and

C.If  $P(A) = 2P(B) = 3P(C)$ , then P(A) is equal to

A.  $\frac{1}{11}$

B.  $\frac{2}{11}$

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

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

**Answer: D**



**Watch Video Solution**

24. A point is selected at random from the interior of a circle. The probability that the point is closer to the centre than the boundary of the circle is

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

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

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

D. None of these

**Answer: C**



**Watch Video Solution**

25. If  $P(A) = P(B) = x$  and  $P(A \cap B) = P(A' \cap B') = \frac{1}{3}$ , then  $x = ?$

A.  $1/2$

B.  $1/3$

C.  $1/4$

**Answer: A**[Watch Video Solution](#)

26. The probability that a police inspector Ravi will catch a thief in a day is  $\frac{1}{4}$  and the probability he will catch a robber in that day is  $\frac{1}{5}$  and the probability that he will catch both a thief and a robber in a day is  $\frac{1}{15}$  then what is the probability that Ravi will catch at least 1 mischief?

A.  $\frac{23}{60}$ B.  $\frac{19}{60}$ C.  $\frac{7}{20}$ 

D. None of these

**Answer: A**[Watch Video Solution](#)

27. Given two events A and B. If odds against A are 2 : 1 and those in favour of  $A \cup B$  are as 3 : 1, then

A.  $\frac{1}{2} \leq P(B) \leq \frac{3}{9}$

B.  $\frac{5}{12} \leq P(B) \leq \frac{3}{4}$

C.  $\frac{1}{2} \leq P(B) \leq \frac{3}{5}$

D. None of these

**Answer: B**



**Watch Video Solution**

28. 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**

**29.** If  $P(A \cup B) = 0.8$  and  $P(A \cap B) = 0.3$ , then  $P(A') + P(B')$  equals

A. 0.3

B. 0.5

C. 0.7

D. 0.9

**Answer: D**



**Watch Video Solution**

30. If A, B, C are three events, then which of the following is/are not correct?

a.  $P$  (Exactly two of A, B and 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 and C occur)

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

d. None of these

A.  $P$  (Exactly two of A, B and 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 and C occur)

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

D. None of these

Answer: D



View Text Solution

31. In a game called odd man out  $m(m > 2)$  persons toss a coin to determine who will buy refreshments for the entire group. A person who gets an outcome different from that of the rest of the members of the group is called the odd man out. The probability that there is a loser in any game is  $1/2m$  b.  $m/2^{m-1}$  c.  $2/m$  d. none of these

A.  $1/2m$

B.  $m/2^{m-1}$

C.  $2/m$

D. None of these

**Answer: B**



**Watch Video Solution**

32. If  $a$  and  $b$  are chosen randomly from the set consisting of number 1, 2, 3, 4, 5, 6 with replacement. Then the probability that



$\lim_{x \rightarrow 0} [(a^x + b^x) / 2]^{2/x} = 6$  is

A.  $1/3$

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

C.  $1/9$

D.  $2/9$

**Answer: C**



**Watch Video Solution**

**33.** 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.  $\frac{{}^{12}C_3 \cdot 2^9}{3^{12}}$

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

D. None of these

**Answer: B**



**Watch Video Solution**

**34.** A die is rolled three times. The probability that the sum of three numbers obtained is 15, is equal to

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

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

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

D.  $\frac{7}{108}$

**Answer: A**



**Watch Video Solution**

**35.** Three cards are drawn at random from a pack of well shuffled 52 cards. Find the probability that (i) all the three cards are of the same suit, (i) one

is a king, the other is a queen and the third a jack.

A.  $\frac{{}^{13}C_3}{{}^{52}C_3}$

B.  $\frac{4 \cdot ({}^{13}C_1 {}^{13}C_1 {}^{13}C_1)}{{}^{52}C_3}$

C.  $\frac{3 {}^{13}C_3 {}^{13}C_1 {}^{13}C_1}{{}^{52}C_3}$

D. None of these

**Answer: B**



**Watch Video Solution**

**36.** 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.  $\frac{5}{12}$

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

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

D. None of these

**Answer: A**



**Watch Video Solution**

37. Fifteen coupons are numbered 1, 2, ..., 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.  $(9/16)^6$

B.  $(8/15)^7$

C.  $(3/5)^7$

D. None of these

**Answer: D**



**Watch Video Solution**

38. A coin is tossed three times. The probability of getting head and tail alternately, is

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

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

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

D. None of these

**Answer: C**



**Watch Video Solution**

39. 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**



**Watch Video Solution**

**40.** A die is loaded so that the probability of a face  $i$  is proportional to  $i$ ,  $i = 1, 2, 6$ . Then find the probability of an even number occurring when the die is rolled.

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

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

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

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

**Answer: D**



**Watch Video Solution**

41. If two numbers  $p$  and  $q$  are chosen randomly from the set  $\{1, 2, 3, 4\}$  with replacement, then the probability that  $p^2 \geq 4q$  is equal to

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

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

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

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

**Answer: D**



**Watch Video Solution**

42. A natural number is chosen at random from the first 100 natural numbers. The probability that  $x + \frac{100}{x} > 50$  is  $\frac{1}{10}$  b.  $\frac{11}{50}$  c.  $\frac{11}{20}$   
d. none of these

A.  $\frac{1}{20}$

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

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

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

**Answer: B**



**Watch Video Solution**

**43.** If two dice are thrown simultaneously, then the probability that the sum of the numbers which come upon the dice to be more than 5 is

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

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

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

D.  $\frac{13}{18}$

**Answer: D**



**Watch Video Solution**



44. Given that  $n$  is odd, number of ways in which three numbers in AP can be selected from  $1, 2, 3, \dots, n$ , is

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

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

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

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

**Answer: D**



**Watch Video Solution**

45. A fair coin is tossed  $2n$  times. The probability of getting as many heads in the first  $n$  tosses as in the last  $n$  is

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

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

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

D. None of these

**Answer: A**



**View Text Solution**

**46.** A bag contains 8 red and 7 black balls. Two balls are drawn at random.

The probability that both the balls are of the same colour is :

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

B.  $\frac{11}{15}$

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

D.  $\frac{4}{15}$

**Answer: C**



**Watch Video Solution**

47. If A and B are any two events such that  $P(A \cup B) = \frac{3}{4}$ ,  $P(A \cap B) = \frac{1}{4}$  and  $P(\bar{A}) = \frac{2}{3}$ , where  $\bar{A}$  stands for the complementary event of A, then what is P(B) ?

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

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

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

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

**Answer: B**



**Watch Video Solution**

48. Let A, B, C be three events. If the probability of occurring exactly one event out of A and B is  $1 - x$ , out of B and C is  $1 - 2x$ , out of C and A is  $1 - x$ , and that of occurring three events simultaneously is  $x^2$ , then prove that the probability that atleast one out of A, B, C will occur is greaer than  $1/2$ .

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

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

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

D. None of these

**Answer: C**



**Watch Video Solution**

**49.** 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 (1)  $\frac{3}{5}$  (2) 0 (3) 1 (4)  $\frac{2}{5}$

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

B. 0

C. 1

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

**Answer: C**



**Watch Video Solution**

**50.** Card is drawn from a pack of 52 cards. A persons bets that it is a spade or an ace. What are the odds against him of winning this bet?

A. 17: 52

B. 52: 17

C. 9: 4

D. 4: 9

**Answer: C**



**Watch Video Solution**

**51.** 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.  $\frac{15}{18}$

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

C.  $\frac{11}{18}$

D.  $\frac{17}{18}$

**Answer: B**



**Watch Video Solution**

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

B.  $P(A \cap B') \geq \frac{1}{3}$

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

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

**Answer: B**

[Watch Video Solution](#)

53. An experiment yield 3 mutually exclusive and exhaustive events A,B, and

C.If  $P(A) = 2P(B) = 3P(C)$ , then P(A) is equal to

A.  $\frac{1}{11}$

B.  $\frac{2}{11}$

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

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

**Answer: D**

[Watch Video Solution](#)

54. A point is selected at random from the interior of a circle. The probability that the point is closer to the centre than the boundary of the circle is

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

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

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

D. None of these

**Answer: C**



**Watch Video Solution**

55. If  $P(A) = P(B) = x$  and  $P(A \cap B) = P(A' \cap B') = 1/3$ , then  $x = ?$

A.  $1/2$

B.  $1/3$

C.  $1/4$

D.  $1/6$

**Answer: A**



**View Text Solution**



56. The probability that a police inspector Ravi will catch a thief in a day is  $\frac{1}{4}$  and the probability he will catch a robber in that day is  $\frac{1}{5}$  and the probability that he will catch both a thief and a robber in a day is  $\frac{1}{15}$  then what is the probability that Ravi will catch at least 1 mischief?

A.  $\frac{23}{60}$

B.  $\frac{19}{60}$

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

D. None of these

**Answer: A**



**View Text Solution**

57. Given two events A and B. If odds against A are 2 : 1 and those in favour of  $A \cup B$  are as 3 : 1, then

A.  $\frac{1}{2} \leq P(B) \leq \frac{3}{9}$

B.  $\frac{5}{12} \leq P(B) \leq \frac{3}{4}$

C.  $\frac{1}{2} \leq P(B) \leq \frac{3}{5}$

D. None of these

**Answer: B**



**Watch Video Solution**

**58.** 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**



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**59.** If  $P(A \cup B) = 0.8$  and  $P(A \cap B) = 0.3$ , then  $P(A') + P(B')$  equals

A. 0.3

B. 0.5

C. 0.7

D. 0.9

**Answer: D**



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**60.** If three events A,B,C are mutually exclusive, then which one of the following is correct?

A.  $P$  (Exactly two of A, B and 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 and C occur)

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

D. None of these

**Answer: D**



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61. In a game called odd man out  $m(m > 2)$  persons toss a coin to determine who will buy refreshments for the entire group. A person who gets an outcome different from that of the rest of the members of the group is called the odd man out. The probability that there is a loser in any game is  $1/2m$  b.  $m/2^{m-1}$  c.  $2/m$  d. none of these

A.  $1/2m$

B.  $m/2^{m-1}$

C.  $2/m$

D. None of these

**Answer: B**



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**62.** If a and b are chosen randomly from the set consisting of number 1, 2, 3, 4, 5, 6 with replacement. Then the probability that

$$\lim_{x \rightarrow 0} [(a^x + b^x)/2]^{2/x} = 6 \text{ is}$$

A.  $1/3$

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

C.  $1/9$

D.  $2/9$

**Answer: C**

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63. 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.  $\frac{{}^{12}C_3 \cdot 2^9}{3^{12}}$

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

D. None of these

**Answer: B**

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64. A die is rolled three times. The probability that the sum of three numbers obtained is 15, is equal to

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

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

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

D.  $\frac{7}{108}$

**Answer: A**



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**65.** Three cards are drawn at random from a pack of well shuffled 52 cards. Find the probability that (i) all the three cards are of the same suit, (ii) one is a king, the other is a queen and the third a jack.

A.  $\frac{{}^{13}C_3}{{}^{52}C_3}$

B.  $\frac{4 \cdot ({}^{13}C_1 {}^{13}C_1 {}^{13}C_1)}{{}^{52}C_3}$

C.  $\frac{3 {}^{13}C_3 {}^{13}C_1 {}^{13}C_1}{{}^{52}C_3}$

D. None of these

**Answer: B**

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

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

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

D. None of these

**Answer: A**

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67. Fifteen coupons are numbered 1, 2, 3, ..., 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.  $(9/16)^6$

B.  $(8/15)^7$

C.  $(3/5)^7$

D. None of these

**Answer: D**



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**68.** A coin is tossed three times. The probability of getting head and tail alternately, is

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

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

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

D. None of these

**Answer: C**



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**69.** 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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70. A die is loaded so that the probability of a face  $I$  is proportional to  $I$ ,  $I = 1, 2, \dots, 6$ . Then the probability of an even number occurring when the die is rolled.

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

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

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

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

**Answer: D**



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71. If two numbers  $p$  and  $q$  are chosen randomly from the set  $\{1, 2, 3, 4\}$  with replacement, then the probability that  $p^2 \geq 4q$  is equal to

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

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

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

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

**Answer: D**



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**72.** A natural number  $x$  is chosen at random from the first 100 natural numbers. Then the probability, for the equation  $x + \frac{100}{x} > 50$  is

A.  $\frac{1}{20}$

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

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

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

**Answer: B**



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73. If two dice are thrown simultaneously, then the probability that the sum of the numbers which come upon the dice to be more than 5 is

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

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

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

D.  $\frac{13}{18}$

**Answer: D**



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74. Given that  $n$  is odd, number of ways in which three numbers in AP can be selected from  $1, 2, 3, \dots, n$ , is

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

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

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

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

**Answer: D**



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**75.** A fair coin is tossed  $2n$  times. The probability of getting as many heads in the first  $n$  tosses as in the last  $n$  is

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

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

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

D. None of these

**Answer: A**



**View Text Solution**

76. A bag contains 8 red and 7 black balls. Two balls are drawn at random.

The probability that both the balls are of the same colour is :

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

B.  $\frac{11}{15}$

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

D.  $\frac{4}{15}$

**Answer: C**



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77. If A and B are any two events such that  $P(A \cup B) = \frac{3}{4}$ ,  
 $P(A \cap B) = \frac{1}{4}$  and  $P(\bar{A}) = \frac{2}{3}$ , where  $\bar{A}$  stands for the  
complementary event of A, then what is P(B) ?

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

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

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

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

**Answer: B**



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**78.** Let  $A, B, C$  be three events. If the probability of occurring exactly one event out of  $A$  and  $B$  is  $1 - x$ , out of  $B$  and  $C$  is  $1 - 2x$ , out of  $C$  and  $A$  is  $1 - x$ , and that of occurring three events simultaneously is  $x^2$ , then prove that the probability that atleast one out of  $A, B, C$  will occur is greaer than  $1/2$ .

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

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

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

D. None of these

**Answer: C**



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79. 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 (1)  $\frac{3}{5}$  (2) 0 (3) 1 (4)  $\frac{2}{5}$

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

B. 0

C. 1

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

**Answer: C**

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80. Card is drawn from a pack of 52 cards. A persons bets that it is a spade or an ace. What are the odds against him of winning this bet?

A. 17: 52

B. 52: 17

C. 9: 4

D. 4: 9

**Answer: C**



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81. 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.  $\frac{15}{18}$

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

C.  $\frac{11}{18}$

D.  $\frac{17}{18}$

**Answer: B**

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

B.  $P(A \cap B') \geq \frac{1}{3}$

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

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

**Answer: B**

83. An experiment yield 3 mutually exclusive and exhaustive events A, B, and C. If  $P(A) = 2P(B) = 3P(C)$ , then P(A) is equal to

A.  $\frac{1}{11}$

B.  $\frac{2}{11}$

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

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

**Answer: D**



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**84.** A point is selected at random from the interior of a circle. The probability that the point is closer to the centre than the boundary of the circle is

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

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

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

D. None of these

**Answer: C**

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85. If  $P(A) = P(B) = x$  and  $P(A \cap B) = P(A' \cap B') = 1/3$ , then  $x = ?$

A.  $1/2$

B.  $1/3$

C.  $1/4$

D.  $1/6$

**Answer: A**

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86. The probability that a police inspector Ravi will catch a thief in a day is  $1/4$  and the probability he will catch a robber in that day is  $1/5$  and the probability that he will catch both a thief and a robber in a day is  $1/15$  then what is the probability that Ravi will catch at least 1 mischief?

A.  $23/60$

B.  $19/60$

C.  $7/20$

D. None of these

**Answer: A**



**View Text Solution**

**87.** Given two events  $A$  and  $B$ . If odds against  $A$  are  $2 : 1$  and those in favour of  $A \cup B$  are as  $3 : 1$ , then

A.  $\frac{1}{2} \leq P(B) \leq \frac{3}{9}$

B.  $\frac{5}{12} \leq P(B) \leq \frac{3}{4}$

C.  $\frac{1}{2} \leq P(B) \leq \frac{3}{5}$

D. None of these

**Answer: B**

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88. 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**

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89. If  $P(A \cup B) = 0.8$  and  $P(A \cap B) = 0.3$ , then  $P(A') + P(B')$  equals

A. 0.3

B. 0.5

C. 0.7

D. 0.9

**Answer: D**



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**90.** If three events A,B,C are mutually exclusive, then which one of the following is correct?

A. P (Exactly two of A, B and 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 and C occur)

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

D. None of these



**Answer: D**



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