# MATHS

## BOOKS - ML KHANNA

## PROBABILITY

### Problem Set 1 Multiple Choice Questions

**1.** The probability of getting head in both trials, when a balanced coin is tossed twice, will be

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

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

C. 1

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

**Answer: A**

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**2.** Two cards are drawn at random from a pack of 52 cards. The probability of these two being aces is

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

B. $\frac{1}{221}$

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

D. none

**Answer: B**

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**3.** From a well shuffled pack of playing cards, two cards are drawn one by one with replacement. The probability that both are aces is

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

B. $\frac{1}{51}$

C. $\frac{1}{221}$

D. none

**Answer: D**

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**4.** A card is drawn from a pack of 52 cards. Find the probability of getting:

(ii) a king or a diamond

A. $\frac{4}{52}$

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

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

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

**Answer: B**

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**5.** A card is drawn at random from apack of cards. The prob. Of this card being a red or queen is

A. $1/3$

B. $1/26$

C. $1/2$

D. $7/13$

**Answer: D**

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**6.** A card is drawn from a well-shuffled pck of cards. The probability of getting a queen of club or a king of heart is

A. $1/52$

B. $1/26$

C. $1/13$

D. none

**Answer: B**

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**7.** A single letter is selected at random from the word "PROBABILITY" . The probability that it is a vowel is

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

B. $\frac{4}{11}$

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

D. 0

**Answer: B**

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**8.** 3 mangoes and 3 apples are in a box. If 2 fruits are chosen at random, the probability that one is a mango and the other is an apple, is

A. $2/3$

B. $3/5$

C. $1/3$

D. none

**Answer: B**

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**9.** A bag contains 5 brown and 4 white socks. A man pulls out two socks. The probability that these are of the same colour is $\frac{5}{108}$ b. $\frac{18}{108}$ c. $\frac{31}{108}$ d. $\frac{48}{108}$

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

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

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

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

**Answer: D**

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**10.** A card is drawn at random from a pack of 100 cards numbered 1 to 100. The probability of drawing a number which is a square, is

A. $1/5$

B. $2/5$

C. $1/10$

D. none

**Answer: C**

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**11.** Two dice are thrown. The probability that the sum of the points on two dice will be 7 is

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

B. $\frac{6}{36}$

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

D. $\frac{8}{36}$

**Answer: B**

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**12.** In a throw of a dice the probability of getting one is even number of throws is

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

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

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

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

**Answer: B**

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**13.** Two dice are thrown simultaneosly. The probability of obtaining a total score of 5 is

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

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

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

D. none

**Answer: C**

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**14.** Three letters are written to different persons and addressess to three envelopes are also written. Without looking at the addresses, the probability that probability that the letters go into right envelopes, is

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

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

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

D. none

**Answer: B**

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**15.** There are 4 envelopes corresponding to 4 letters. If the letters are placed in the envelopes at random, probability that all the letters are not placed in the right envelopes is

A. $1/24$

B. $1$

C. $23/24$

D. $9/2$

**Answer: C**

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

A. $1/6$

B. $1/18$

C. $1/36$

D. none

**Answer: C**

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**17.** One die and one coin are tossed simultaneously. The probability of getting 6 on die and head on coin is

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

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

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

D. none

**Answer: C**

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**18.** A coin is tossed and a die is rolled. The chance that the coin shows a head and the die shows 3 is

A. $1/8$

B. $1/12$

C. $1/2$

D. 1

**Answer: B**

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**19.** From a pack of cards two are drawn the first being replaced before the second is drawn Find the probability that the first is a diamond and the second is a king .

A. $13/4$

B. $4/13$

C. $1/52$

D. 52

**Answer: C**

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**20.** Seven chits are numbered 1 to 7. three are drawn one by one with replacements. The probability that the least number on any selected chit is 5, is

A. $1-(2/7)^4$

B. $4.\,(2/7)^4$

C. $(3/7)^3$

D. none

**Answer: C**

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**21.** Two cards are drawn successively with replacement from a well-shuffled pack of 52 cards. The probability of drawing two aces is

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

B. $\frac{1}{13} \times \frac{1}{17}$

C. $\frac{1}{52} \times \frac{1}{51}$

D. $\frac{1}{13} \times \frac{4}{51}$

**Answer: A**

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**22.** 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. $(1/16)^6$

B. $(8/15)^7$

C. $(3/5)^7$

D. none

**Answer: C**

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**23.** There are 20 cards , 10 of these cards have the letter 'I' printed on them and the other 10 have the letter 'T' printed on them. If three cards are picked up at random and kept in the same order, the probability of making word IIT is

A. $\frac{9}{80}$

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

C. $\frac{4}{27}$

D. $\frac{5}{38}$

**Answer: D**

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**24.** A' draws two cards with replacement from a pack of 52 cards and 'B' throws a pair of dice what is the chance that 'A' gets both cards of same

suit and 'B' gets total of 6

A. $1/144$

B. $1/4$

C. $5/144$

D. $7/144$

**Answer: C**

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**25.** In a box containing 100 bulbs, 10 are defective. What is the probability that out of a sample of 5 bulbs, (i) none is defective and (ii) exactly 2 are defective ?

A. $10^{-5}$

B. $\left(\frac{1}{2}\right)^5$

C. $(9/10)^5$

D. $9/10$

**Answer: C**

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**26.** An unbiased die with faced marked 1, 2, 3, 4, 5, and 6 is rolled four times. Out of four face value obtained, the probability that the minimum face value is not less than 2 and the maximum face value is not greater than five is then $16/81$ b. $1/81$ c. $80/81$ d. $65/81$

A. $16/81$

B. $1/81$

C. $80/81$

D. $65/81$

**Answer: A**

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**27.** A student appears for tests I, II and III. The student is successful if the passes either in tests I and II or tests I and III. The probabilities of the student passing in tests I, II and III are p,q and $\frac{1}{2}$, respectively. If the probability that the student is successful, is $\frac{1}{2}$, then

A. $p = q = 1$

B. $p = q = \frac{1}{2}$

C. p=1,q=0

D. p=1, q=$\frac{1}{2}$

**Answer: C**

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**28.** Two dice are thrown simultaneously, the probability of obtaining total score of 7 is $1/6$ b. $7/36$ c.$4/9$ d. $11/36$

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

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

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

D. none

**Answer: A**

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

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

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

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

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

**Answer: B**

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**30.** 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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**31.** Of cigarette smoking population 70% are men and 30% are women, 10% of these men and 20% of these women smoke wills. Probability that a person seen smoking a Wills to be a man is

A. $1/5$

B. $7/13$

C. $5/13$

D. $7/10$

**Answer: B**

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**32.** Two numbers are chosen at random from {1, 2, 3, 4, 5, 6} at a time. The probability that the smaller of the two is less than 4, is

A. $4/5$

B. $1/15$

C. $1/5$

D. $14/15$

**Answer: A**

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**33.** The chance of throwing an ace first only of two successive throws with an ordinary die is

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

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

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

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

**Answer: B**

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**34.** Words from the letters of the work PROBABILITY are formed by taking al at a time. The probability that both B's are together and both I's are together is

A. $\frac{1}{55}$

B. $\frac{2}{55}$

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

D. none

**Answer: B**

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**35.** One of the two events must occur. If the chance of one is 2/3 of the other, then odds in favour of the other are a. 1:3 b. 3:1 c. 2:3 d. 3:2

A. $1:3$

B. $3:1$

C. $2:3$

D. none

**Answer: D**

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**36.** A number is chosen at random among the first 120 natural numbers. The probability of the number chosen being a multiple of 5 or 15 is

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

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

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

D. none

**Answer: A**

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**37.** If 3 distinct numbers are chosen randomly from {1,2, . .. 100}, then probability that all are divisible by both 2 and 3 is

A. $4/25$

B. $4/35$

C. $4/33$

D. $4/1155$

**Answer: D**

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**38.** There are 3 works. One is of 3 volumes, one is of 4 volumes and one is of only one and they are placed a random in at shelf. What is the chance that volume of the same work is placed together

A. $1/40$

B. $3/140$

C. $9/70$

D. none

**Answer: B**

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**39.** From a pack of 52 cards, the cards are drawn till an ace appears . Probability that an ace does not come in first 26 cards is,

A. $46/153$

B. $23/27$

C. $109/153$

D. none

**Answer: D**

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**40.** The probability of India winning a test match against West Indies is 1/2. Assuming independence from match to match, find the probability that in a match series Indias second win occurs at the third test.

A. $1/8$

B. $1/4$

C. $1/2$

D. $2/3$

**Answer: B**

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**41.** If 10 biscuits be distributed at random among 20 beggars, what is the chance that a particular beggar receives 3 biscuits ?

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**42.** A six-faced dice is so biased that it is twice as likely to show an even number as an odd number when thrown. It is thrown twice, the probability that the sum of two numbers thrown is even is $1/12$ b. $1/6$ c. $1/3$ d. $5/9$

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**43.** Three of the six vertices of a regular hexagon are chosen at random. The probability that the triangle with these three vertices is equilateral equals :

A. $1/2$

B. $1/5$

C. $1/10$

D. $1/20$

**Answer: C**

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**44.** Three tangents are drawn at random to a given circle. Show that the odds are $3:1$ against the circle being inscribed in the triangle formed by the tangents.

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**45.** In shuffling a pack of cards three are accidentally dropped. The probability that the missing cards are of distinct colours is

A. $169/425$

B. $261/425$

C. $104/425$

D. none

**Answer: A**

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**46.** A person draws . two cards with replacement from a pack of 52 cards . What is the chance that he gets both cards of the same suit?

A. $1/4$

B. $3/13$

C. $1/16$

D. none

**Answer: A**

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**47.** Find the probability that a leap year selected at random will contain 53 sundays .

A. $7/366$

B. $26/183$

C. $1/7$

D. $2/7$

**Answer: D**

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**48.** Find the probability of getting more than 7 when two dice are rolled.

A. $7/36$

B. $7/12$

C. $5/12$

D. none

**Answer: C**

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**49.** The probability that in the toss of two dice we obtain an even sum or a sum less than 5 is

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

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

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

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

**Answer: D**

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**50.** In throwing of two dice, the probability of getting a multiple of 4 is

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

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

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

D. none

**Answer: C**

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**51.** An arbitrary cube has four blank faces, one face marked 2 and another marked 3. Then the probability of obtaining a total of exactly 12 in 5 throws is

A. $\frac{5}{1296}$

B. $\frac{5}{1944}$

C. $\frac{5}{2592}$

D. none

**Answer: C**

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**52.** From 4 children, 2 women and 4 men , 4 are selected. Probability that there are exactly 2 children among the selected is

A. $11/21$

B. $9/21$

C. $10/21$

D. none

**Answer: B**

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**53.** What is the chance of getting multiple of 2 on one and multiple of 3 one the other in a single throw of two dice

A. $1/3$

B. $7/36$

C. $11/36$

D. none

**Answer: C**

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

A. $2/7$

B. $3/7$

C. $4/7$

D. none

**Answer: A**

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**55.** A pack of cards contains 4 aces, 4 kings, 4 queens and 4 jacks. Two cards are drawn t random. the probability that at least one of them is an ace is a. 1/5 b. 3/16 c. 9/20 d. 1/9

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

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

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

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

**Answer: C**

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**56.** The probability that an event A happens in one trial of an experiment is 0.7. Three independent rials of the experiment are performed. The probability that the event A happens at least once is

A. $\cdot 657$

B. $\cdot 973$

C. $\cdot 027$

D. $\cdot 343$

**Answer: B**

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**57.** If two dice are thrown find probability of getting an odd number one and multiple of 3 on other is

A. $1/3$

B. $1/4$

C. $11/36$

D. $\frac{13}{36}$

**Answer: C**

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**58.** In solving any problem, odds against A are 4 to 3 and in favour of Bin solving the same is 7 to 5. The probability that problem will be solved is

A. $5/21$

B. $16/21$

C. $15/84$

D. $69/84$

**Answer: B**

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**59.** The probability that a person will hit a target in shooting practice is 0.3. If he shoots 10 times, the probability that he hits the target is

A. 1

B. $1-(0\cdot 7)^{10}$

C. $(0\cdot 7)^{10}$

D. $(0\cdot 3)^{10}$

**Answer: B**

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**60.** The probability that a man aged 50 years will die in a year is p. The probability that out of n men $A_1, A_2, A_3, \ldots\ldots, A_n$ each aged 50 year, $A_1$ will die and first to die is

A. $1-(1-p)^n$

B. $\left[1-(1-p)^n\right]/n^2$

C. $\left[1-(1-p)^n\right]/n$

D. none

**Answer: C**

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**61.** If the probability that A and B will die within a year are p and q respectively, then the probability that only one of them will be alive at the end of the year, is

A. $p+q$

B. $p + q - 2pq$

C. $p + q - pq$

D. $p + q + pq$

**Answer: B**

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**62.** The probability that Krishna will be alive 10 years hence is 7/15 and that Hari will be alive is 7/10. What is t he probability that both Krishna and Hari will be dead 10 years hence?

A. $\frac{21}{150}$

B. $\frac{24}{150}$

C. $\frac{49}{150}$

D. $\frac{56}{150}$

**Answer: B**

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**63.** 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. $\left(\frac{9}{10}\right)^6$

B. $\left(\frac{8}{15}\right)^7$

C. $\left(\frac{3}{5}\right)^7$

D. none

**Answer: C**

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**64.** Two numbers are chosen at random from {1, 2, 3, 4, 5, 6} at a time. The probability that the smaller of the two is less than 4, is

A. $4/5$

B. $1/15$

C. $1/5$

D. $14/15$

**Answer: A**

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**65.** The probability that a certain beginner at golf gets a good shot if he uses the correct club is $\frac{1}{3}$, and the probability of a good shot with an incorrect club is $\frac{1}{4}$. In his bag are 5 different clubs, only one of which is correct for the shot is question. if he chooses a club at random and takes a stroke, the probabilitiy that he gets a good shot is

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

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

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

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

**Answer: C**

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**66.** Two bags contain 3 white, 2 black and 2 white, 4 black balls respectively. A ball is chosen at random then the probability of its being black is

A. $\frac{8}{15}$

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

C. $\frac{6}{4}$

D. none

**Answer: A**

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**67.** A purse contains 4 copper coins, 3 silver coins, the second purse contains 6 copper coins and 2 silver coins. A coin is taken out of any purse, the probability that it is a copper coin is

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

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

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

D. $\frac{37}{56}$

**Answer: D**

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**68.** A cricket club has 15 members, of them of whom only 5 can bowl. If the names of 15 members are put into a box and 11 are drawn at random, then the probability of getting an eleven containing at least 3 bowlers is $7/13$ b. $6/13$ c. $11/158$ d. $12/13$

A. $\frac{7}{13}$

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

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

D. none

**Answer: C**

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**69.** On a toss of two dice, A throws a total of 5, then the probability that he will throw another 5 before the throws 7, is

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

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

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

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

**Answer: C**

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**70.** A,B,C in order toss a coin. A start s to toss the first one to throw a head wins. Assuming the game continues indefinite their respective chances of winning the game are

A. $\frac{4}{7}, \frac{2}{7}, \frac{1}{7}$

B. $\frac{1}{7}, \frac{4}{7}, \frac{2}{7}$

C. $\frac{2}{7}, \frac{4}{7}, \frac{1}{7}$

D. none

**Answer: A**

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**71.** Find the mean number of heads in three tosses of a fair coin.

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

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

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

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

**Answer: A**

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**72.** Two persons each make a single throw with a die. The probability they get equal value is $P_1$. Four persons each make a single throw and probability of three being equal is $P_2$. Then

A. $P_1 = P_2$

B. $P_1 < P_2$

C. $P_1 > P_2$

D. none

**Answer: C**

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**73.** A bag has 13 red, 14 green and 15 black balls, The probability of getting exactly 2 black on pulling out 4 balls is $P_1$. Now the number of each colour ball is doubled and 8 balls are pulled out. The probability of getting exactly 4 blacks is $P_2$ then.

A. $P_1 = P_2$

B. $P_1 > P_2$

C. $P_1 < P_2$

D. none

**Answer: B**

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**74.** Ina certain town, 40% of the people have brown hair, 25% have brown eyes, and 15% have both brown hair and brown eyes. If a person selected

at random from the town has brown hair, the probability that he also has brown eyes is $1/5$ b. $3/8$ c. $1/3$ d. $2/3$

A. $1/5$

B. $3/8$

C. $1/3$

D. $2/3$

**Answer: B**

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**75.** Two persons, A and B, have respectively n+1 and n coins, which they toss simultaneously. Then the probability that A will have more heads that B is

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

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

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

D. none

**Answer: A**

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**76.** If the letters of the word REGULATION be arranged at random, the probability that there will be exactly four letters between R and E is

A. $1/5$

B. $1/2$

C. $1/9$

D. $1/10$

**Answer: C**

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**77.** A biased die is tossed and the respective probabilities for various faces to turn up are

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Face | : | 1 | 2 | 3 | 4 | 5 | 6 |
| Probability | : | 0.1 | 0.24 | 0.19 | 0.18 | 0.15 | 0.14 |

If an even face has turned up, then the probability that it is face 2 or face 4, is

A. $0 \cdot 25$

B. $0 \cdot 42$

C. $0 \cdot 75$

D. $0 \cdot 9$

**Answer: C**

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**78.** In a purse there are 9 five paisa coins and one rupee coin. In another purse there are all 10 five paisa coins. 9 coins are taken from the former and put into the second and then 9 coins are taken from the latter and

put into the first. What is the chance that rupee coin is still in the first purse

A. $1/9$

B. $10/19$

C. $5/19$

D. none

**Answer: B**

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**79.** A and B throw alternately with a pair of dice. A wins if he throws 6 before B throws 7, and B if he throws 7 before A throws 6. If A begins, find his chance of winning.

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**80.** Ten pairs of shoes are in a closet. Four shoes are selected at random. Find the probability that there is at least one pair among the four selected.

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**81.** A person throws two dice, on the common cube, and the other regular tetrahedron, the number in the lowest face being taken in the case of a tetrahedron. What is the chance that the sum of the numbers thrown is not less than 5?

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**82.** Out of 21 tickets consecutively numbered, three are drawn at random. Find the chance that the numbers on them are in A.P.

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**83.** Cards are dealt one by one from a well shuffled pack until an ace appears. Find the chance that exactly n cards are dealt before the first ace.

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**84.** An urn contains 4 white and 5 black balls, a second urn contains 5 white and 4 black balls. One ball is transferred from the first to second urn, then a ball is drawn from the second urn, what is the probability that it is white ?

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**85.** In a group of equal number of men and women 10% men and 45% women are unemployed. What is the probability that a person selected at random is employed ?

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**86.** A bag contains 3 black and 4 red balls. Two balls are drawn at random one at a time without replacement. What is the probability that the first ball selected is black, if the second ball is known to be red ?

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**87.** If P(A)=0.3, P(B)=0.2 and P(C)=0.1 and A,B,C are independent events, find the probability of occurrence of at least one of the three events A,B and C.

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**88.** Find the probability of getting at least one head in three throws of a coin.

A. $7/8$

B. $3/8$

C. $1/8$

D. none

**Answer: A**

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**89.** The probability of solving a problem by three students X, Y and Z is $\frac{1}{2}, \frac{1}{3}$ and $\frac{1}{4}$ respectively. the probability that the problem will be solved is :

A. $1/4$

B. $1/2$

C. $3/4$

D. $1/3$

**Answer: C**

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**90.** The probability of a problem being solved by two students are 1/2, 1/3. the proba-bility of the problem being solved is

A. $2/3$

B. $4/3$

C. $1/3$

D. $1$

**Answer: A**

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**91.** Find the probability of getting at least one tail in 4 tosses of a coin.

A. $15/16$

B. $1/16$

C. $1/4$

D. 1

**Answer: A**

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**92.** The probability that a marksman will hit a target is given as $\frac{1}{5}$. Then, the probabiltiy that atleast one hit in 10 shots is

A. $1-\left(\frac{4}{5}\right)^{10}$

B. $\frac{1}{5^{10}}$

C. $1-\frac{1}{5^{10}}$

D. none

**Answer: A**

Watch Video Solution

**93.** The probability that a man can hit a target is $3/4$. He tries 5 times. The probability that he will hit the target at least three times is

A. $\frac{291}{364}$

B. $\frac{371}{464}$

C. $\frac{471}{502}$

D. $\frac{459}{512}$

**Answer: D**

Watch Video Solution

**94.** A coin is tossed 3 times. The probability of obtaining at least two heads will be

A. $3/8$

B. $1/2$

C. 1

D. 2

**Answer: B**

Watch Video Solution

**95.** 8 coins are tossed simultaneously. The probability of getting at least 6 heads is

A. $57/64$

B. $229/256$

C. $7/64$

D. $37/256$

**Answer: D**

Watch Video Solution

**96.** From a group of 4 boys and 3 girls, candidates are arranged at random, one after the other, for an interview. The probability that the boys and girls alternate, is

A. $1/34$

B. $1/35$

C. $1/33$

D. $1/32$

**Answer: B**

Watch Video Solution

**97.** Out of 13 applicants for a job, there are 5 women and 8 men It is desired to select 2 persons for the job. The probability that atleast one of the selected persons will be a woman is.

A. $\frac{25}{39}$

B. $\frac{14}{39}$

C. $\frac{5}{13}$

D. $\frac{10}{13}$

**Answer: A**

Watch Video Solution

**98.** The probability that an event A happens in one trial of an experiment, is 0.4 There independent trials of the experiments are performed. The probability that the event A happens atleast once, is

A. $0 \cdot 936$

B. $0 \cdot 784$

C. $0 \cdot 904$

D. none

**Answer: B**

Watch Video Solution

**99.** The probability that a man will live 10 more years is $\frac{1}{4}$ and the probability that his wife will live 10 more years is $\frac{1}{3}$. Then the probability that neither will be alive in 10 years is

A. $5/12$

B. $1/2$

C. $7/12$

D. $11/12$

**Answer: B**

Watch Video Solution

**100.** Odds 8 to 5 against a person who is 40 years old living till he is 70 year and 4 to 3 against another person now 50 years till he will be living 80 years. Probability that one of them will be alive next 30 years

A. $59/91$

B. $44/91$

C. $51/91$

D. $32/91$

**Answer: B**

Watch Video Solution

**101.** The probability that a student is not a swimmer is $\frac{1}{5}$. What is the probability that out of 5 students, 4 are swimmers?

A. ${}^5C_4\left(\frac{4}{5}\right)^4\frac{1}{5}$

B. $\left(\frac{4}{5}\right)^4\frac{1}{5}$

C. ${}^5C_1\frac{1}{5}\left(\frac{4}{5}\right)^4$

D. none

**Answer: A**

Watch Video Solution

**102.** A die is thrown thrice. A success is or 6 in a throw. Find the mean and variance of the number of successes.

A. $\mu = 1, \sigma^2 = 2/3$

B. $\mu = 2/3, \sigma^2 = 1$

C. $\mu = 2, \sigma^2 = 2/3$

D. none

**Answer: A**

Watch Video Solution

**103.** The Binomial distribution whose mean is 3 and whose standard deviation is 3/2 is

A. $(1/2 + 1/2)^{12}$

B. $(1/4 + 3/4)^{12}$

C. $(3/4+1/4)^{12}$

D. none

**Answer: C**

Watch Video Solution

**104.** India plays two matches each with West Indies and Australia. In any match the probabilities of India getting points 0,1 and 2 are 0.45, 0.05 and 0.50 respectively. Assuming that the outcomes are independent, the probability of India getting at least 7 points is

A. $0\cdot 8750$

B. $\cdot 0875$

C. $0\cdot 0625$

D. $0\cdot 0250$

**Answer: B**

Watch Video Solution

**105.** The value of $P(2)$ in a Binomial distribution when p=1/6 and n=5 is

A. $\frac{3125}{7776}$

B. $\frac{250}{7776}$

C. $\frac{1250}{7776}$

D. $\frac{25}{7776}$

**Answer: C**

Watch Video Solution

**106.** One hundred identical coins, each with probability 'p' of showing heads are tossed once. If $0 < p < 1$ and the probability of heads showing on 50 coins is equal to that of heads showing on 51 coins, then the value of p is

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

B. $\frac{49}{101}$

C. $\frac{50}{101}$

D. $\frac{51}{101}$

**Answer: D**

Watch Video Solution

**107.** A class consists of 80 students 25 of them are girls and 55 boys. If 10 of them are rich and the remaining poor and also 20 of them are intelligent them the probability of selecting an intelligent rich girl is

A. $5/128$

B. $25/128$

C. $5/512$

D. none

**Answer: C**

Watch Video Solution

**108.** v37

A. $1/2$

B. $1/8$

C. $3/8$

D. none

**Answer: A**

Watch Video Solution

**109.** A coin and a die are thrown simultaneously. The probability that a head appears on coin and '3' on the die is

A. $1/8$

B. $1/12$

C. $1/2$

D. 1

**Answer: B**

Watch Video Solution

**110.** $AandB$ are two independent events. The probability that both $AandB$ occur is 1/6 and the probability that neither of them occurs is 1/3. Find the probability of the occurrence of $A$.

A. $1/2$

B. $1/3$

C. 0

D. 1

**Answer: A::B**

Watch Video Solution

**111.** If on an average, 1 ship in every 10 is sunk, find the chance that out of 5 ships expected 4 at least will arrive safely.

Watch Video Solution

**112.** Of three independent events the prob. that the first only should happen is $\frac{1}{4}$, the prob. that the second only should happen is $\frac{1}{8}$ and the probability that the third only should happen is $\frac{1}{12}$. Obtain the unconditional probabilities of the three events.

View Text Solution

**113.** Two sets of candidates are competing for the position on the board of directors of a company. The probabilities that the first and second sets will win are 0.6 and 0.4 respectively. If the first set wins, the probability of introducing a new product is 0.8 and the corresponding probability if the

second set wins is 0.3. What is the probability that the new product will be introduced ?

Watch Video Solution

**114.** In a bolt factory machines A,B,C manufacture respectively 25, 35 and 40 percent of the total. Out of their output 5,4 and 2 percent are defective bolts. A bolt is drawn from the produce and is found defective. What is the probability that it was manufactured by A?

Watch Video Solution

**115.** A manufacturing firm produces steel pipes in three plants with daily production volumes of 500, 1000, and 2000 units respectively. According to past experience it is known that fractions of defective outputs produced by the three plants are respectively 0.005, 0.008 and 0.010 . if a pipe is selected from day's total production and found to be defective, what is the probability that it came from the first plant ?

Watch Video Solution

**116.** If the events A and B are independent, then $P(A \cap B)$ is equal to

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

B. $P(A)P(B)$

C. $P(A/B)$

D. $P(B/A)$

**Answer: B**

Watch Video Solution

**117.** If A and B are mutually exclusive events, then $P(A \cap B)$ equals

A. 0

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

C. 1

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

**Answer: A**

Watch Video Solution

**118.** If A and B are arbitrary events, then

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

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

C. $P(A \cap B) = P(A) + P(B) - 1$

D. none

**Answer: A**

Watch Video Solution

**119.** 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. $P(A \cap B) \leq P(A) + P(B)$

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

D. none

**Answer: B**

Watch Video Solution

**120.** The happening of any one of the two mutually exclusive events A and B is

A. $P[A].\ P[B]$

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

C. $P[A]+P[B]$

D. none

**Answer: C**

Watch Video Solution

**121.** For any two independent events $E_1$ and $E_2$, $P\{E_1 \cup (E_2) \cap (\overline{E_1}) \cap (\overline{E_2})\}$ is

A. $\leq 1/4$

B. $> 1/4$

C. $\geq 1/2$

D. none

**Answer: A**

Watch Video Solution

**122.** If A and B are two events such that $P(A) > 0$ and $P(B) \neq 1$, then $P\left(\frac{\overline{A}}{B}\right)$ is equal to

A. $1 - P(A/B)$

B. $1 - P(\overline{A}/B)$

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

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

**Answer: C**

Watch Video Solution

**123.** If there are n independent trials, p and q are the probability of success and failure respectively, then probability of exactly r success

A. $q^n$

B. ${}^nC_r q^n p^r$

C. ${}^nC_r q^{n-r} p^r$

D. ${}^{n}C_{r}p^{n-r}q^{r}$

**Answer: C**

Watch Video Solution

**124.** If A and B ar two events such that $P(A \cup B) = \frac{5}{6}, P(A \cap B) = \frac{1}{3}$ and $P\left(\overline{B} = \frac{1}{2}\right)$ then the events A and B are

A. dependent

B. independent

C. mutually exclusive

D. none

**Answer: B**

Watch Video Solution

**125.** If $P(A) = 0 \cdot 65, P(B) = 0 \cdot 15, P(\overline{A}) + P(\overline{B}) =$

A. $1 \cdot 5$

B. $1 \cdot 2$

C. $0 \cdot 8$

D. none

**Answer: B**

Watch Video Solution

**126.** Two events $AandB$ have probabilities 0.25 and 0050, respectively. The probability that both $AandB$ occur simultaneously is 0.14. then the probability that neither $A$ nor$B$ occurs is a. 0.39 b. 0.25 c. 0.11 d. none of these

A. $\cdot 75$

B. $\cdot 61$

C. $\cdot 39$

D. none

**Answer: C**

Watch Video Solution

**127.** The probability of an event A occurring is 0.5 and of B occuring is 0.3. If A and B are mutually exclusive events, then the probability of neither A nor B occurring is

A. $0 \cdot 6$

B. $0 \cdot 5$

C. $0 \cdot 7$

D. none

**Answer: D**

Watch Video Solution

**128.** The simulataneous occurrence of two dependent events A and B is

A. $P(A).\ P(B/A)$

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

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

D. none

**Answer: A**

Watch Video Solution

**129.** Two independent events A and B will happen simultaneously, the probability is

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

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

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

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

**Answer: C**

Watch Video Solution

**130.** If A and B are two independent events in a sample space then $P(\overline{A}/\overline{B})$ equals

A. $1 - P(A/B)$

B. $1 - P(\overline{A}/B)$

C. $1 - P(B)$

D. $1 - P(A)$

**Answer: D**

Watch Video Solution

**131.** The probability that at least one of the event A and B occurs is 0.6. If A and B occur simultaneously with probability 0.2, then find $P(A)+P(B)$.

A. $0\cdot 4$

B. $0\cdot 8$

C. $1\cdot 2$

D. $1\cdot 4$

**Answer: C**

Watch Video Solution

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

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

B. $P\left(A^C-B^C\right)=P\left(A^C\right)-P\left(B^C\right)$

C. $P(A \cup B)^C = P\left(A^C\right).P\left(B^C\right)$

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

**Answer: C::D**

Watch Video Solution

**133.** If E and F are independent events such that $0 < P(E) < 1$ and $0 < P(F) < 1$, then

A. E and F are mutually exclusive

B. E and $F^C$ (complement of the event F) are independent

C. $E^C$ and $F^C$ are independent

D. $P(E/F) + P\left(E^C/F\right) = 1$

**Answer: B::C::D**

Watch Video Solution

**134.** If A and B are any two events, the probability that exactly one of them occurs is

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

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

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

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

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

Watch Video Solution

**135.** 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. $1/12$

B. $3/4$

C. $5/12$

D. $23/36$

**Answer: A**

Watch Video Solution

**136.** Let E and F be two independent events. The probability that both E and F happen is $\frac{1}{12}$ and the probability that neither E nor F happens is $\frac{1}{2}$, then a value of $\frac{P(E)}{P(F)}$ is

A. $P(E) = \frac{1}{3}, P(F) = \frac{1}{4}$

B. $P(E) = \frac{1}{2}, P(F) = \frac{1}{6}$

C. $P(E) = \frac{1}{6}, P(F) = \frac{1}{2}$

D. $P(E) = \frac{1}{4}, P(F) = \frac{1}{3}$

**Answer: A::D**

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**137.** A and B are two independent events. The probability that both A and B occur is 1/6 and the probability that neither of them occurs is 1/3. the probability of A is

A. $P(A) = 1/2, P(B) = 1/3$

B. $P(A) = 1/2, P(B) = 1/6$

C. $P(A) = 1/3, P(B) = 1/2$

D. none

**Answer: A::C**

View Text Solution

**138.** For any two events A and B in a sample space

A. $P(A/B) \geq \dfrac{P(A) + P(B) - 1}{P(B)}, P(B) \neq 0$ is always true.

B. $P\left(A \cap \overline{B}\right) = P(A) - P(A \cap B)$ does not hold

C. $P(A \cup B) = 1 - P\left(\overline{A}\right)P\left(\overline{B}\right)$, if A and B are independent

D. $P(A \cup B) = 1 - P(\overline{A})P(\overline{B})$, if A and B are disjoint

**Answer: A::C**

Watch Video Solution

**139.** If A and B are two events, the probability that exactly one of them occurs is given by

A. $P(M) + P(N) - 2P(M \cap N)$

B. $P(M) + P(N) - P(M \cap N)$

C. $P\left(M^C\right) + P\left(N^C\right) - 2P\left(M^C \cap N^C\right)$

D. $P\left(M \cap N^C\right) + P\left(M^C \cap N\right)$

**Answer: A::C::D**

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**140.** For two given event A and B, $P(A \cap B)$ is

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

B. not greater than $P(A) + P(B)$

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

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

**Answer: A::C**

Watch Video Solution

**141.** If A and B are arbitrary events then

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

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

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

D. $P(A \cup B) \geq P(A) + P(B)$

**Answer: A**

Watch Video Solution

**142.** There are 3 bags each containing 5 white balls and 2 black balls, and 2 bags each containing 1 white ball and 4 black balls, a black ball having been drawn, find the chance that it came from the first group.

Watch Video Solution

**143.** A fair die is tossed repeatedly until a 6 is obtained. Let X denote the number of tosses required.

The probability that $X = 3$ equals

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

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

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

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

**Answer: A**

Watch Video Solution

**144.** A fair die is tossed repeatedly until a 6 is obtained. Let X denote the number of tosses rerquired.

The probability that $\geq 3$ equals

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

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

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

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

**Answer: B**

Watch Video Solution

**145.** A fair die is tossed repeatedly until a six obtained. Let X denote the number of tosses required.

The conditional probability that $X \geq 6$ given $X > 3$ equals

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

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

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

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

**Answer: D**

Watch Video Solution

**146.** A pair of fair dice is thrown independently three times. The probability of getting a score of exactly 9 twice is (1) 1/729 (2) 8/9 (3) 8/729 (4) 8/243

A. $\frac{1}{729}$

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

C. $\frac{8}{729}$

D. $\frac{8}{243}$

**Answer: D**

Watch Video Solution

**147.** An experiment has 10 equally likely outcomes. Let A and B be two non-empty events of the experiment. If a consists of 4 outcomes, the number of outcomes that B must have so that A and B are independent , is

A. 2,4 or 8

B. 3,6 or 9

C. 4 or 8

D. 5 or 10

**Answer: D**

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**148.** There are $n$ urns numbered 1 to $n$. The ith urn contains $i$ white contains $i$ white and $(n+1-i)$ black balls. Let $E_i$ denote the even of selecting ith urn at random and let $W$ denote the event that the ball drawn from the selected urn is white. If $P(E_i) \propto i$ for $i = 1, 2 \ldots\ldots\ldots, n$ then $\lim_{n \to \infty} P(W)$ is

A. $2/3$

B. $1/3$

C. $1/2$

D. $3/4$

**Answer: A**

Watch Video Solution

**149.** There are n urns each continuous (n+1) balls such that the ithurn contains 'I' white balls and (n+1-i) red balls. Let $u_1$ be the event of selecting ith urn, i=1,2,3.....n and W denotes the event of getting a white balls.

If n is even and E dentes the event of choosing even numbered urn $\left[P(u_i) = \frac{1}{n}\right]$, then the value of $P(W/E)$ is

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

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

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

D. $\left(\frac{n+1}{n+2}\right)$

**Answer: C**

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**150.** There are n urns $U_i, (i = 1, \ldots, n)$ which contains $i$ white and (n+1-i) black balls. $U_i$ is even of selecting the jth urn, W event of getting

white ball from the selected urn, E is event of getting even number of balls from selected urn.

Q. $P(U_i) = \frac{1}{n}$, and one urn is selected at random, then P(W) is:

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

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

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

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

**Answer: A**

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**151.** Let $H_1, H_2, \ldots, H_n$ be mutually exclusive and exhaustive events with $P(H_i) > 0, i = 1, 2, \ldots n$. Let E be any other event with $0 < P(E) < 1$.

STATEMENT-1: $P(H_i \mid E) > P(E \mid H_1).\ P(H_i)$ for $i = 1, 2, \ldots, n$

because

STATEMENT-2: $\sum_{i=1}^{n} P(H_i) = 1$

A. (a)Statement -1 is true , Statement -2 is true, Statement -2 is a correct explanation for Statement -1

B. (b)Statement -1 is true , Statement -2 is true, Statement -2 is not a correct explanation for Statement -1

C. (c)Statement -1 is true , Statement -2 is false

D. (d)Statement-1 is false, Statement-2 is true

**Answer: B**

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## Problem Set 1 True And False

**1.** A and B throw a pair of dice. If A throws 9, find Bs chance of throwing a higher number.

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**2.** If A and B are mutually exclusive events, then they will be independent also.

Watch Video Solution

**3.** Two independent events are always mutually exclusive.

Watch Video Solution

**4.** If the probabilities for A to fail in an examination is 0.2 and that for B is 0.3, then the probability that either A or B fails is

Watch Video Solution

**5.** The odds in favour of A winning a game of chess against B are 5:2. if three games are to be played, then the odds in favour of A's winning at least one game are 355:8.

Watch Video Solution

Watch Video Solution

**6.** If $(A_1 \cup A_2) = 1 - P(A_1^c)P(A_2^c)$ where C is the complementary then $A_1$ and $A_2$ are independent.

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**7.** A and B each throw a die. Then it is 7:5 that A's throw is not greater than B's.

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**8.** A biased die is tossed and the respective probabilities for various faces to turn up are

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Face | : | 1 | 2 | 3 | 4 | 5 | 6 |
| Probability | : | 0.1 | 0.24 | 0.19 | 0.18 | 0.15 | 0.14 |

If an even face has turned up, then the probability that it is face 2 or face 4, is

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**9.** The probabilities of three mutually exclusive events A, B and C are given by 2/3,1/4 and 1/6 respectively. The statement. a. is true b. is false c. nothing can be said d. could be either

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**10.** Ten students are seated at random in a row. The probability that two particular students are not seated side by side is 4/5.

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**11.** Two persons A and B throw a coin alternatively till one of them gets head and wins the game. Find their respective probabilities of winning.

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## Problem Set 1 Fill In The Blanks

**1.** A pair of unbiased dice are rolled together till a sum of either 5 or 7 is obtained. Then find the probability that 5 comes before 7.

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**2.** The probability that a bomb dropped from a plane strikes the target is 1/5. the probability that out of six bombs dropped, at least two bombs strike the target is ____

Watch Video Solution

**3.** A pair of dice is thrown 4 times. If getting a doublet is considered a success, find the probability of two successes.

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**4.** A determinant is chosen at random from the set of all determinants of order two with elements 0 or 1 only. Probability that the determinant chosen has positive value is

Watch Video Solution

**5.** For a biased die, the probabilities for the different faces to turn up are given by the table

| Face | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Probability | 0.1 | 0.32 | 0.21 | 0.15 | 0.05 | 0.17 |

The die is thrown and you are told that either the face 1 or the face 2 has turned up, then the probability that it is face 1, is

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**6.** The probability of getting a number between 1 and 100 which is divisible by 1 and itself only is____

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**7.** A box contains 100 tickets numbered 1, 2, 3, ... ,100. Two tickets are chosen at random. It is given that the maximum number on the two chosen tickets is not more than 10. the minimum number on them is 2 with probability_____.

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**8.** P(A cup B)=P(A cap B)` if and only if the relation between P(A) and P(B) is .....

Watch Video Solution

**9.** If A and B be two events such that $P(A) = 0 \cdot 3$ and $P\left(A \cup \overline{B}\right) = 0 \cdot 8$. If A and B are independent events, then P(B)=____

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**10.** If $E_1$ and $E_2$ are exclusive events then $P(E_1 \cap E_2)$=____

Watch Video Solution

**11.** If $\frac{1+3p}{3}, \frac{1-p}{4}$ and $\frac{1-2p}{2}$ are the probabilities of three mutually exclusive events, then the set of all values of p is ____.

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

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

A. (0,1)

B. $\left(-\frac{1}{4}, \frac{1}{3}\right)$

C. $\left(0, \frac{1}{3}\right)$

D. $(0, \infty)$

**Answer: A::C::D**

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**13.** If $E_1$ and $E_2$ are two events and $E_2$ is a subset of $E_1$ then $P(E_1/E_2)$ =_____

Watch Video Solution

**14.** If two events A and B are such that $P(\overline{A}) = 0.3, P(B) = 0.4$ and $P(A \cap \overline{B}) = 0.5,$ then $P\left(\frac{B}{A \cup \overline{B}}\right)$ is equal to

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**15.** If $P(A \cup B) = 0 \cdot 9, P(B) = 0 \cdot 4$ when A and B are independent events then P(A)=_____

Watch Video Solution

Watch Video Solution

**16.** Urn A contains 6 red and 4 black balls and urn B contains 4 red and 6 black balls, one ball is drawn at random from urn A and placed in urn B. then one ball drawn at random from urn B and placed in urn A. if one ball is now drawn from urn A, the probability that it is found to be red is____

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**17.** The probability that India wins a cricket test match against England is 1/3. if india and england play three test matches, the probability that India will win at least one test match is____

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Self Assessment Test

**1.** The probability of getting heads in both trials, when a balanced coin is tossed twice, will be

A. $1/4$

B. $1/2$

C. 1

D. $3/4$

**Answer: A**

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**2.** Two cards are drawn at random from a pack of 52 cards. The probability of these two being aces is

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

B. $\frac{1}{221}$

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

D. none

**Answer: B**

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**3.** An almirah stores 5 black and 4 white socks well mixed. A boy pulls out 2 socks at random. The probability that 2 are of the same colour is

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

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

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

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

**Answer: D**

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**4.** A and B throw a pair of dice. If A throws 9, find Bs chance of throwing a higher number.

A. 1

B.

C. both

D. none

**Answer: A**

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**5.** Two cards are drawn successively with replacement from a well-shuffled pack of 52 cards. The probability of drawing two aces is

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

B. $\frac{1}{13} \times \frac{1}{17}$

C. $\frac{1}{52} \times \frac{1}{51}$

D. $\frac{1}{13} \times \frac{4}{51}$

**Answer: A**

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**6.** A pack of cards contains 4 aces, 4 kings, 4 queens and 4 jacks. Two cards are drawn at random. The probability that at least one of them is an ace is

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

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

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

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

**Answer: A**

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**7.** Three urns contain respectively 3 white and 1 black balls, 2 white and 2 black, 1 white and 3 black. One ball is selected at random from each urn. Find the chance that the three selected comprise 1 white and 2 black balls.

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**8.** Two dice are thrown. What is the probability of scoring either a double, or a sum greater than 9 ?

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**9.** An integer is chosen at random from the first two hundred digits. What is the probability that the integer chosen is divisible by 6 or 8 ?

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**10.** A person draws a card from a pack of playing cards, replaces it and shuffles the pack. He continues doing this until he shows a spade. The chance that he will fail the first two times is

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

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

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

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

**Answer: A**

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**11.** If A and B are mutually exclusive events, then they will be independent also.

A. 1

B.

C. both

D. none

**Answer: B**

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**12.** Two independent events are always mutually exclusive.

A. 1

B.

C. both

D. none

**Answer: B**

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**13.** Three letters are written to different persons and addressess to three envelopes are also written. Without looking at the addresses, the probability that probability that the letters go into right envelopes, is

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

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

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

D. none

**Answer: B**

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**14.** The probability that a student is not a swimmer is $\frac{1}{5}$. What is the probability that out of 5 students, 4 are swimmers?

A. ${}^5C_4\left(\frac{4}{5}\right)^4\frac{1}{5}$

B. $\left(\frac{4}{5}\right)^4\frac{1}{5}$

C. ${}^5C_1 \frac{1}{5}\left(\frac{4}{5}\right)^4$

D. none

**Answer: A**

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**15.** Probability of throwing a 5 only on the first of two successive throws of an ordinary die is

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

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

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

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

**Answer: B**

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**16.** A fair coin is tossed repeatedly. If tail appears on first four tosses, them the probability of head appearing that 2 white and 1 black balls will be drawn, is

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

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

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

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

**Answer: A**

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**17.** There are three works,one consisting of 3 volumes, one of 4, and the other of 1 volume. They are placed on a shelf at random. Find the chance that volumes of the same works are all together.

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**18.** A bag contains 4 white, 5 red and 6 black balls. Three are drawn at random. Find the probability that (i) no ball drawn is black, (ii) exactly 2 are black (iii) all are of the same colour.

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**19.** An urn contains 11 balls numbered from 1 to 11. if a ball is selected at random, what is the probability of having a ball with a number which is multiple of either 2 or 3 ?

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**20.** The probability that a certain beginner at golf gets a good shot if he uses the correct club is $\frac{1}{3}$, and the probability of a good shot with an incorrect club is $\frac{1}{4}$. In his bag are 5 different clubs, only one of which is correct for the shot is question. if he chooses a club at random and takes a stroke, the probability that he gets a good shot is

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

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

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

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

**Answer: C**

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**21.** The probability that in the toss of two dice we obtain the sum 7 or 11 is

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

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

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

D. $\frac{23}{108}$

**Answer: C**

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**22.** Two dice are thrown. The probability that the sum of the points on two dice will be 7 is

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

B. $\frac{6}{36}$

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

D. $\frac{8}{36}$

**Answer: B**

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**23.** Two dice are thrown simultaneosly. The probability of obtaining a total score of 5 is

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

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

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

D. none

**Answer: C**

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**24.** A can solve 75% of the problems of Mathematics and B can solve 70%. What is the probability that either A or B can solve a problem chosen at random ?

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**25.** A room has three lamp sockets. From a collection of 10 light bulbs of which only six ar good, three bulbs are selected at random and placed in the sockets. What is the probability that there will be light in the room ?

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**26.** One of the two events must occur. If the chance of one is 2/3 of the other, then odds in favour of the other are a. 1:3 b. 3:1 c. 2:3 d. 3:2

A. $1:3$

B. $3:1$

C. $2:3$

D. none

**Answer: D**

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**27.** An arbitrary cube has four blank faces, one face marked 2 and another marked 3. Then the probability of obtaining a total of exactly 12 in 5 throws is

A. $\frac{5}{1296}$

B. $\frac{5}{1944}$

C. $\frac{5}{2592}$

D. none

**Answer: C**

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**28.** An experiment succeeds twice as often as it fails. Find the probability that in the next six trials, there will be atleast 4 successes.

Watch Video Solution

**29.** The probability that a marksman will hit a target is given as $\frac{1}{5}$. Then, the probabiltiy that atleast one hit in 10 shots is

A. $1-\left(\frac{4}{5}\right)s$

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

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

D. none

**Answer: A**

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**30.** The probability that a man can hit a target is $3/4$. He tries 5 times. The probability that he will hit the target at least three times is

A. $\frac{291}{364}$

B. $\frac{371}{464}$

C. $\frac{471}{502}$

D. $\frac{459}{512}$

**Answer: D**

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**31.** The probability of 'n' independent events are $P_1, P_2, P_3 \ldots\ldots, P_n$ . Find an expression for probability that at least one of the events will happen.

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**32.** A's skill is to B as 1:3, to C's as 3:2 and to D's as 4:3, find the chance that A in three trials, one with each person, will succeed twice at least.

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**33.** Five person A,B,C,D,E throw a dice in the order specified until one of them throws an ace, find their relative chances of winning, supposing the throws to continue till an ace appears.

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**34.** Three urns contain respectively 1 white, 2 black balls, 2W and 1B balls, 2 W and 2B balls. One ball is transferred from the first urn into the second, then one from the letter is transferred into the third. Finally one ball is drawn from the third urn. what is the probability of its being white ?

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

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**36.** The odds in favour of A winning a game of chess against B are 5:2. if three games are to be played, then the odds in favour of A's winning at least one game are 355:8 .If this is true give answer 1 else 0.

A. 1

B. 0

C. both

D. none

**Answer: A**

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**37.** A number is chosen at random among the first 120 natural numbers. The probability of the number chosen being a multiple of 5 or 15 is

A. $1/5$

B. $1/8$

C. $1/6$

D. none

**Answer: A**

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**38.** The probability of an event A occurring is 0.5 and of B occuring is 0.3. If A and B are mutually exclusive events, then the probability of neither A nor B occurring is

A. $0 \cdot 6$

B. $0 \cdot 5$

C. $0 \cdot 7$

D. none

**Answer: D**

Watch Video Solution

**39.** The probability that an event A happens in one trial of an experiment, is 0.4 There independent trials of the experiments are performed. The probability that the event A happens atleast once, is

A. $0 \cdot 936$

B. $0 \cdot 784$

C. $0 \cdot 904$

D. none

**Answer: B**

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**40.** A single letter is selected at random from the word "PROBABILITY" . The probability that it is a vowel is

A. $3/11$

B. $4/11$

C. $2/11$

D. 0

**Answer: A**

Watch Video Solution

**41.** In a box containing 100 bulbs, 10 are defective. What is the probability that out of a sample of 5 bulbs, (i) none is defective and (ii) exactly 2 are defective ?

A. $10^{-5}$

B. $(1/2)^5$

C. $(9/10)^5$

D. $9/10$

**Answer: C**

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**42.** If the probabilities for A to fail in an examination is 0.2 and that for B is 0.3, then the probability that either A or B fails is

A. 1

B. 0.44

C. both

D. none

**Answer: B**

Watch Video Solution

**43.** A multiple choice examination has 5 questions. Each question has three alternative answers of which exactly one is correct. The probability that a student will get 4 or more correct answers just guessing is

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

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

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

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

**Answer: C**

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**44.** The probability of having at least one tail 4 throws with a coin is

A. $15/16$

B. $1/16$

C. $1/4$

D. 1

**Answer: A**

Watch Video Solution

**45.** From a pack of cards two are drawn the first being replaced before the second is drawn Find the probability that the first is a diamond and the second is a king .

A. $13/4$

B. $4/13$

C. $1/52$

D. 52

**Answer: C**

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**46.** Two cards are drawn at random from a pack of playing cards. Find the probability that one card is a heart and the other is an ace.

View Text Solution

**47.** Two uniform dice marked 1 to 6 are tossed together. The probability of the total 7 in a single throw is

A. $5/36$

B. $5/12$

C. $2/31$

D. $1/6$

**Answer: D**

Watch Video Solution

**48.** The probability of India winning a test match against west Indies is 1/2. assuming independence from match to match, the probability that in a 5 match series India's second win occurs at third test is

A. $1/8$

B. $1/4$

C. $1/2$

D. $2/3$

**Answer: B**

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**49.** A coin is tossed (m+n) times $(m > n)$. Find the probability of at least m consecutive heads.

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

Watch Video Solution

**51.** Three persons A, B and C, in order, cut a pack of cards replacing them after each cut on the condition that the first who cuts a spade shall win the prize. Find their respective chances.

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**52.** One bag contains 5 white and 3 red balls, and a second bag contains 4 white and 5 red balls. From one of them chosen at random two balls are drawn, find the chance that they are of different colours.

Watch Video Solution

**53.** Supposing that it is 9 to 7 against a person A who is now 35 years of age living till he is 65, and 3 to 2 against a person B now 45 till he is 75, find the chance that one at least of these persons will be alive 30 years hence.

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**54.** In shuffling a pack of 52 playing cards, four are accidently dropped; find the chance that the missing cards should be one from each suit.

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**55.** The probability that Krishna will be alive 10 years hence is 7/15 and that Hari will be alive is 7/10. What is t he probability that both Krishna and Hari will be dead 10 years hence?

A. $\frac{21}{150}$

B. $\frac{24}{150}$

C. $\frac{49}{150}$

D. $\frac{56}{150}$

**Answer: B**

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**56.** A bag has 13 red, 14 green and 15 black balls, The probability of getting exactly 2 black on pulling out 4 balls is $P_1$. Now the number of each colour ball is doubled and 8 balls are pulled out. The probability of getting exactly 4 blacks is $P_2$ then.

A. $P_1 = P_2$

B. $P_1 > P_2$

C. $P_1 < P_2$

D. none

**Answer: B**

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**57.** A purse contains 4 copper coins, 3 silver coins, the second purse contains 6 copper coins and 2 silver coins. A coin is taken out of any purse, the probability that it is a copper coin is

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

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

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

D. $\frac{37}{56}$

**Answer: D**

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**58.** Two persons, A and B, have respectively n+1 and n coins, which they toss simultaneously. Then the probability that A will have more heads that B is

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

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

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

D. none

**Answer: A**

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**59.** 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. $\left(\frac{9}{10}\right)^6$

B. $\left(\frac{8}{15}\right)^7$

C. $\left(\frac{3}{5}\right)^7$

D. none

**Answer: C**

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**60.** An unbiased die with faced marked 1, 2, 3, 4, 5, and 6 is rolled four times. Out of four face value obtained, the probability that the minimum face value is not less than 2 and the maximum face value is not greater than five is then $16/81$ b. $1/81$ c. $80/81$ d. $65/81$

A. $16/81$

B. $1/81$

C. $80/81$

D. $65/81$

**Answer: A**

Watch Video Solution

**61.** A box contains 100 tickets, numbered 1,2,3, . . .100. two tickets are chosen at random. It is given that the maximum number on the two chosen tickets is not more than 10. The minimum number of them is 2 with probability. . . . .

View Text Solution

**62.** A student appears for tests I, II and III. The student is successful if the passes either in tests I and II or tests I and III. The probabilities of the student passing in tests I, II and III are p,q and $\frac{1}{2}$, respectively. If the probability that the student is successful, is $\frac{1}{2}$, then

A. p=q=1

B. p=q=$\frac{1}{2}$

C. p=1,q=0

D. p=1,q=$\frac{1}{2}$

**Answer: C**

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**63.** If $\frac{1+3p}{3}, \frac{1-p}{4}$ and $\frac{1-2p}{2}$ are the probabilities of three mutually exclusive events, then the set of all values of p is ____.

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**64.** If $\frac{1-3p}{2}, \frac{1+4p}{3}$ and $\frac{1+p}{6}$ are the probabilities of three mutually exclusive events, then the set of all values of p is____

A. (0,1)

B. $\left(-\frac{1}{4}, \frac{1}{3}\right)$

C. $\left(0, \frac{1}{3}\right)$

D. $(0, \infty)$

**Answer: B**

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**65.** Urn A contains 6 red and 4 black balls and urn B contains 4 red and 6 black balls. One ball is drawn at random from urn A and placed in urn B. Then, one ball is drawn at random from urn B and placed in urn A. If one ball is drawn at random from urn A, the probability that it is found to be red, is....

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**66.** One hundred identical coins, each with probability $p,$ of showing up heads are tossed once. If `0

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

B. $\frac{49}{101}$

C. $\frac{50}{101}$

D. $\frac{51}{101}$

**Answer: D**

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**67.** India plays two matches each with West Indies and Australia. In any match the probabilities of India getting points $0, 1 \text{ and } 2$ are $0.45, 0.05 \text{ and } 0.50$ respectively. Assuming that the outcomes are independent, the probability of India getting at least 7 points is (a) $0.8750$ (b) $0.0875$ (c) $0.0625$ (d) $0.0250$

A. $0 \cdot 8750$

B. $\cdot 0875$

C. $0 \cdot 0625$

D. $0 \cdot 0250$

**Answer: B**

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**68.** There are 3 bags each containing 5 white balls and 2 black balls, and 2 bags each containing 1 white ball and 4 black balls, a black ball having been drawn, find the chance that it came from the first group.

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**69.** Consider a family with two children. Assume that each child is as likely to be a boy as it is to be a girl. Find the conditional probability that both children are boys, given that (i) the older child is a boy, (ii) at least one of the children is a boy.

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**70.** A coin is tossed 3 times. The probability of obtaining at least two heads will be

A. $3/8$

B. $1/2$

C. 1

D. 2

**Answer: B**

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**71.** 8 coins are tossed simultaneously. The probability of getting at least 6 heads is

A. $57/64$

B. $229/256$

C. $7/64$

D. $37/256$

**Answer: D**

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**72.** A sample of size 4 is drawn with replacement (without replacement) from an urn containing 12 balls, of which 8 are white, what is the conditional probability that the ball drawn on the third draw was white, given that the sample contains 3 white balls ?

View Text Solution

**73.** If two events A and B are such that $P\left(A^C\right) = 0 \cdot 3$ $P(B) = 0 \cdot 4$ and $P\left(AB^C\right) = 0 \cdot 5$ then $P\left[B/\left(A \cup B^C\right)\right] =$ ____

Watch Video Solution

**74.** If A and B are two events such that $P(A \cup B) = 5/6, P(A \cap B) = 1/3, P\left(\overline{B}\right) = 1/2$, then the events A and B are

A. dependent

B. independent

C. mutually exclusive

D. none

**Answer: B**

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**75.** A and B each throw a die. Then it is 7:5 that A's throw is not greater than B's.

A. 1

B.

C. both

D. none

**Answer: A**

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**76.** Two persons each makes a single throw with a die. The probability they get equal value is $P_1$. Four persons each makes a single throw and probability of three being equal is $P_1$. Then

A. $P_1 = P_2$

B. $P_1 < P_2$

C. $P_1 > P_2$

D. none

**Answer: C**

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**77.** A cricket team has 15 members, of whom only 5 can bowl. If the names of the 15 members are put into a hat and 11 drawn random, then the chance of obtaining an eleven containig at least 3 bowlers

A. $\frac{7}{13}$

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

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

D. none

**Answer: C**

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**78.** On a toss of two dice, A throws a total of 5, then the probability that he will throw another 5 before the throws 7, is

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

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

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

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

**Answer: C**

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**79.** A pair of unbiased dice are rolled together till a sum of either 5 or 7 is obtained. Then find the probability that 5 comes before 7.

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**80.** For any two events A and B, prove that

$P\left[\left(A \cap \overline{B}\right) \cup \left(B \cap \overline{A}\right)\right] = P(A) + P(B) - 2P(A \cap B).$

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**81.** If $P(B) = \frac{1}{4}, p\left(\bar{A} \cap B \cap \bar{C}\right) = \frac{1}{3}, P\left(A \cap B \cap \bar{C}\right) = \frac{1}{3},$ Then $P(B \cap C)$ is

A. $1/12$

B. $3/4$

C. $5/12$

D. 23//36`

**Answer: A**

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**82.** If the events A and B are independent, then $P(A \cap B)$ is equal to

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

B. $P(A)P(B)$

C. $P(A/B)$

D. $P(B/A)$

**Answer: B**

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**83.** If A and B are mutually exclusive events, then $P(A \cap B)$ equals

A. 0

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

C. 1

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

**Answer: A**

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**84.** If A and B are suchg that events that $P(A) > 0$ and $P(B) \neq 1$, then $P(A'/B')$ equals to

A. $1 - P(A/B)$

B. $1 - P(\overline{A}/B)$

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

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

**Answer: C**

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**85.** P(A cup B)=P(A cap B)` if and only if the relation between P(A) and P(B) is .....

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**86.** If A and B are arbitrary events, then

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

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

C. $P(A \cap B) = P(A) + P(B) - 1$

D. none

**Answer: A**

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**87.** 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. $P(A \cap B) \leq P(A) + P(B)$

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

D. none

**Answer: B**

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**88.** For two given event A and B, $P(A \cap B)$ is

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

B. not greater than $P(A) + P(B)$

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

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

**Answer: A::B::C**

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

A. $P(M) + P(N) - 2P(M \cap N)$

B. $P(M) + P(N) - P(M \cap N)$

C. $P\left(M^C\right) + P\left(N^C\right) - 2P\left(M^C \cap N^C\right)$

D. $P\left(M \cap N^C\right) + P\left(M^C \cap N\right)$

**Answer: A::C::D**

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**90.** If E and F are independent events such that $0 < P(E) < 1$ and $0 < P(F) < 1$, then

A. E and F are mutually exclusive

B. E and $F^C$ (complement of the event F) are independent

C. $E^C$ and $F^C$ are independent

D. $P(E/F) + P\left(E^C/F\right) = 1$

**Answer: B::C::D**

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**91.** E and F are two independent events. The probability that both e and F happen is 1/12 and the probability that neither E nor F happens is 1/2. Then

A. $P(E) = \frac{1}{3}, P(F) = \frac{1}{4}$

B. $P(E) = \frac{1}{2}, P(F) = \frac{1}{6}$

C. $P(E) = \frac{1}{6}, P(F) = \frac{1}{2}$

D. $P(E) = \frac{1}{4}, P(F) = \frac{1}{3}$

**Answer: A::D**

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**92.** If A and B are mutually exclusive events,then $P(A \cup B) =$

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

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

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

D. $P(A)\,/\,P(B)$

**Answer: A**

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**93.** If A and B are two independent events in a sample space then $P(\overline{A}/\overline{B})$ equals

A. $1 - P(A/\overline{B})$

B. $1 - P(\overline{A}/B)$

C. $1 - P(B)$

D. $1 - P(A)$

**Answer: D**

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**94.** For any two events A and B in a sample space

A. $P(A/B) \geq \dfrac{P(A) + P(B) - 1}{P(B)}$, $P(B) \neq 0$ is always true.

B. $P(A \cap \overline{B}) = P(A) - P(A \cap B)$ does not hold

C. $P(A \cup B) = 1 - P(\overline{A})P(\overline{B})$, if A and B are independent

D. $P(A \cup B) = 1 - P(\overline{A})P(\overline{B})$, if A and B are disjoint.

**Answer: A::C**

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**95.** The probabilities of three mutually exclusive events A,B,C are : $P(A) = 2/3, P(B) = 1/4, P(C) = 1/6$. Is the statement

A. 1

B. wrong

C. could be either

D. do not know

**Answer: B**

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**96.** The probability that at least one of the events A and B occurs is 0.7 and they occur simultaneously with probability 0.2. Then, $P(\overline{A}) + P(\overline{B}) =$

A. $0 \cdot 4$

B. $0 \cdot 8$

C. $1 \cdot 2$

D. $1 \cdot 4$

**Answer: C**

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

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

B. $P\left(A^C - B^C\right) = P\left(A^C\right) - P\left(B^C\right)$

C. $P(A \cup B)^C = P\left(A^C\right).P\left(B^C\right)$

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

**Answer: C::D**

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**98.** For the three events

$\mathrm{A, B, and C, P(exactly one of the events A or B occurs)} = \mathrm{P(exact}$
$= \mathrm{p}$

and

$\mathrm{P(all three events occur simultaneously)} = \mathrm{p}^2, \mathrm{where 0}$

Then, find the probability of occurrence of at least one of the three events $A, B, and C.$

A. $\frac{3p + 2p^2}{2}$

B. $\frac{p + 3p^2}{4}$

C. $\frac{p + 3p^2}{2}$

D. $\frac{3p + 2p^2}{4}$

**Answer: A**

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**99.** For a biased die, the probabilities for the different faces to turn up are given by the table

| Face | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Probability | 0.1 | 0.32 | 0.21 | 0.15 | 0.05 | 0.17 |

The die is thrown and you are told that either the face 1 or the face 2 has turned up, then the probability that it is face 1, is

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**100.** A biased die is tossed and the respective probabilities for various faces to turn up are

| Face | : | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Probability | : | 0.1 | 0.24 | 0.19 | 0.18 | 0.15 | 0.14 |

If an even face has turned up, then the probability that it is face 2 or face 4, is

A. $0 \cdot 25$

B. $0 \cdot 42$

C. $0 \cdot 75$

D. $0 \cdot 9$

**Answer:**

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

A. $1/6$

B. $1/36$

C. $1/18$

D. $3/28$

**Answer: B**

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**102.** A letter is known to have come either from LONDON or CLIFTON, on the postmark only the two consecutive letters ON are eligible. The probability that it come from LONDON is

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**103.** A card from a pack 52 cards is lost. From the remaining cards , two cards are drawn and are found to be speades. Find the probability that missing card is also a spade.

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**104.** The probability that in the toss of two dice we obtain an even sum or a sum less than 5 is

A. $1/2$

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

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

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

**Answer: D**

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**105.** A determinant is chosen at random from the set of all determinants of order two with elements 0 or 1 only. Probability that the determinant chosen has positive value is

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**106.** An experiment has 10 equally likely outcomes. Let A and B be two non-empty events of the experiment. If a consists of 4 outcomes, the number of outcomes that B must have so that A and B are independent , is

A. 2, 4 or 8

B. 3, 6 or 9

C. 4 or 8

D. 5 or 10

**Answer: D**

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**107.** One ticket is selected at ransom form 50 tickets numbered $00, 01, 02, \ldots, 49$. Then the probability that the sum of the digits on the selected ticket is 8, given that the product of these digits is zero, is

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

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

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

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

**Answer: B**

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**108.** In a binomial distribution $B\left(n, p=\frac{1}{4}\right)$, if the probability of at least one success is greater than or equal to $\frac{9}{10}$, then n is greater than

(1) $\frac{1}{(\log)_{10}^{4}-(\log)_{10}^{3}}$ (2) $\frac{1}{(\log)_{10}^{4}+(\log)_{10}^{3}}$ (3) $\frac{9}{(\log)_{10}^{4}-(\log)_{10}^{3}}$ (4) $\frac{4}{(\log)_{10}^{4}-(\log)_{10}^{3}}$

A. $\frac{4}{\log_{10}4-\log_{10}3}$

B. $\frac{1}{\log_{10}4-\log_{10}3}$

C. $\frac{1}{\log_{10}4+\log_{10}3}$

D. $\frac{9}{\log_{10}4-\log_{10}3}$

**Answer: B**

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

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

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

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

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

**Answer: A**

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**110.** An urn contains nine balls of which three are red, four are blue and two are green. Three balls are drawn at random without replacement from the urn. The probability that the three balls have different colour, is

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

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

C. $\frac{1}{21}$

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

**Answer: B**

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**111.** Three numbers are chosen at random without replacement from {1, 2, 3, ..... 8}. The probability that their minimum is 3, given that their maximum is 6, is (1) $\frac{3}{8}$ (2) $\frac{1}{5}$ (3) $\frac{1}{4}$ (4) $\frac{2}{5}$

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

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

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

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

**Answer: B**

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**112.** A single which can can be green or red with probability $\frac{4}{5}$ and $\frac{1}{5}$ respectively, is received by station A and then transmitted to station B. The probability of each station reciving the signal correctly is $\frac{3}{4}$. If the singal received at station B is green, then the probability that original singal was green is

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

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

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

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

**Answer: C**

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**113.** Consider 5 independent Bernoulli.s trials each with probability of success p. If the probability of at least one failure is greater than or equal to $\frac{31}{32}$, then p lies in the interval : (1) $\left(\frac{1}{2}, \frac{3}{4}\right]$ (2) $\left(\frac{3}{4}, \frac{11}{12}\right]$ (3) $\left[0, \frac{1}{2}\right]$ (4) $\left(\frac{11}{12}, 1\right]$

A. $\left(\frac{1}{2}, \frac{3}{4}\right)$

B. $\left(\frac{3}{4}, \frac{11}{12}\right)$

C. $\left(0, \frac{1}{2}\right)$

D. $\left(\frac{11}{12}, 1\right)$

**Answer: C**

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**114.** 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 $\omega^{r1} + \omega^{r2} + \omega^{r3} = 0$ is $1/18$ b. $1/9$ c. $2/9$ d. $1/36$

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

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

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

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

**Answer: C**

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**115.** Let E and F be two independent events. The probability that exactly one of them occurs is $11/25$ and the probability of none of them occurring is $2/25$. If P(T) denotes the probability of occurrence of the event T, then

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

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

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

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

**Answer: A::D**

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**116.** A ship is fitted with three engines $E_1, E_2,$ and $E_3$ the engines function independently of each othe with respectively probability $1/2, 1/4,$ and $1/4.$ For the ship to be operational at least two of its engines must function. Let X denote the event that the ship is operational and let $X_1, X_2,$ and $X_3$ denote, respectively, the events that the engines $E_1, E_2,$ and $E_3$ are functioning. Which of the following is (are) true?

A. $P\left[X_1^C \mid X\right] = \frac{3}{16}$

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

C. $P[X \mid X_2] = \frac{5}{16}$

D. $P[X \mid X_1] = \frac{7}{16}$

**Answer: B::D**

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

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

B. X and Y are independent

C. X and Y are not independent

D. $P(X' \cap Y) = \frac{1}{3}$

**Answer: A::B**

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**118.** Let $U_1$ , and $U_2$, be two urns such that $U_1$, contains $3$ white and $2$ red balls, and $U_2$, contains only$1$ white ball. A fair coin is tossed. If head appears then $1$ ball is drawn at random from $U_1$, and put into $U_2$, . However, if tail appears then $2$ balls are drawn at random from $U_1$, and

put into $U_2$. . Now 1 ball is drawn at random from $U_2$, .61 . The probability of the drawn ball from $U_2$, being white is

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

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

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

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

**Answer: B**

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**119.** Given that the drawn ball from U2 is white, the probability that head appeared on the coin

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

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

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

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

**Answer: D**

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**120.** A fair die is tossed repeatedly until a 6 is obtained. Let X denote the number of tosses required.

The probability that $X = 3$ equals

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

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

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

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

**Answer: A**

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**121.** A fair die is tossed repeated until a six is obtained. Let X denote the number of tosses required.

The probability that $X \geq 3$ is

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

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

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

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

**Answer: B**

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**122.** A fair die is tossed repeatedly until a six obtained. Let X denote the number of tosses required.

The conditional probability that $X \geq 6$ given $X > 3$ equals

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

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

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

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

**Answer: D**

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## Miscellaneous Exercise Comprehension

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

A. $1/2$

B. $1/3$

C. $2/5$

D. $1/5$

**Answer: C**

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## Miscellaneous Exercise Assertion Reason

**1.** Let $H_1, H_2, ..., H_n$ be mutually exclusive events with $P(H_i) > 0, i = 1, 2, ..... n.$ Let $E$ be any other event with $0 < P(E)$ Statement I $P(H_i \mid E) > P(E \mid H_i . P(H_i)$ for $i = 1, 2, ..... , n$ statement II $\sum_{i=1}^{n} P(H_i) = 1$

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## Miscellaneous Exercise

**1.** Let $E^\circ$ denotes the complement of an event E. If E, F, G are pairwise independent events with $P(G) > 0$ and $P(E \cap F \cap G) = 0.$ Then, $P(E^\circ \cap F^\circ \mid G)$ equals :

A. $P\left(E^C\right)+P\left(F^C\right)$

B. $P\left(E^C\right)-P\left(F^C\right)$

C. $P\left(E^C\right)-P(F)$

D. $P(E)-P\left(F^C\right)$

**Answer: C**

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**2.** There are n urns each continuous (n+1) balls such that the ithurn contains 'I' white balls and (n+1-i) red balls. Let $u_1$ be the event of selecting ith urn, i=1,2,3.....n and W denotes the event of getting a white balls.

If n is even and E dentes the event of choosing even numbered urn $\left[P(u_i)=\frac{1}{n}\right]$, then the value of $P(W/E)$ is

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**3.** If $P(u_i))\infty i$ , where $i = 1, 2, 3, \ldots, n$then $\lim_{n \to w} P(w)$ is equal to

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

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

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

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

**Answer: A**

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**4.** If $P(U_i) = C$ (constant), then $P\left(\frac{U_n}{W}\right)$, where n is even :

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

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

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

D. $\left(\frac{n+1}{n+2}\right)$

**Answer: C**

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**5.** $P(U_i) = \frac{1}{n}$, and one urn is selected at random, then P(W) is:

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

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

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

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

**Answer: A**

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**6.** Probabilities of Ramesh using car, scooter, bus and train are 1/7, 2/7, 3/7 and 1/7 respectively. Probabilities of him reaching office late with these

vehicles are 2/9, 4/9, 1/9 and 1/9 respectively. If he reaches office on time, find the probability that he went by car.