



## MATHS

### BOOKS - MODERN PUBLICATION MATHS (KANNADA ENGLISH)

### PROBABILITY

#### Multiple Choice Questions Level I

1. The three digit numbers are formed using the digits 0,2,4,6,8 . A Number is chosen at random out of these numbers . What is the probability that this number has the same digits ?

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

B.  $\frac{16}{25}$

C.  $\frac{1}{645}$

D.  $\frac{1}{25}$

**Answer: D**



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2. Three squares of chess board are selected at random . The probability of getting 2 squares of one colour and other of a different colour is :

A.  $\frac{16}{21}$

B.  $\frac{8}{21}$

C.  $\frac{3}{32}$

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

**Answer: A**



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3. If A and B are any two events having

$P(A \cup B) = \frac{1}{2}$  and  $P(\overrightarrow{A}) = \frac{2}{3}$ , then the probability of

$\overline{A} \cap B$  is :

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

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

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

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

**Answer: C**



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4. Three of the six vertices of a regular hexagon are chosen at random . What is probability that the triangle with these vertices is equilateral ?

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

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

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

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

**Answer: D**



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5. If A,B,C are three mutually exclusive and exhaustive events of an experiment such that :  $3P(A) = 2P(B) = P(C)$  then P(A) is equal to :

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

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

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

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

**Answer: B**



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6. Let A and B be two events .If  $P(A) = 0.2$   $P(B) = 0.4$  ,  
 $P(A \cup B) = 0.6$  then  $P(A/B)$  is equal to :

A. 0.8

B. 0.5

C. 0.3

D. 0

**Answer: D**



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7. Let A and B be two events such that  $P(A) = 0.6$  ,  $P(B) = 0.2$   
and  $P(A/B) = 0.5$  , Then  $P(A/B)$  is equal to :

A.  $\frac{1}{10}$

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

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

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

**Answer: C**



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

A.  $A$  and  $B$  are mutually exclusive

B.  $A$  and  $B$  are independent

C. A and B are independent

D. A and B are independent

**Answer: A**

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9. Let  $X$  be a distance random variable assuming values  $x_1, x_2, \dots, x_n$  with probabilities  $p_1, p_2, \dots, p_n$  respectively. The variance of  $X$  is given by :

A.  $E(X^2)$

B.  $E(X^2) + E(X)$

C.  $E(X^2) - [E(X)]^2$

D.  $\sqrt{(E(X^2) - [E(X)]^2)}$



**Answer: C**



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**10.** 4 persons are selected at random from a group of 3 men , 2 women and 4 children . The probability that exactly two of them are children is :

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

B.  $\frac{9}{21}$

C.  $\frac{10}{21}$

D.  $\frac{10}{23}$

**Answer: C**



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11. In a single throw of two dice the chance of throwing a sum of 8 is :

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

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

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

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

**Answer: B**



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12. A positive integer is chosen at random . The probability that sum of the digits of its square is 33 is :

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

B.  $\frac{1}{33}$

C.  $\frac{2}{33}$

D. None of these

**Answer: D**



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**13.** The probability that a leap year selected at random will contain 53 Sundays or 53 Mondays is :

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

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

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

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

**Answer: B**



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**14.** Two persons A and B appear in an interview for two vacancies . If the probability of their selection are  $\frac{1}{4}$  and  $\frac{1}{6}$  respectively , then probability that none of them is selected is :

A.  $\frac{1}{24}$

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

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

D.  $\frac{19}{12}$

**Answer: C**



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**15.** Three letters are sent to different persons and addresses on the three envelopes are written at random . The probability that the letters go into the right envelopes is :

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

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

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

D. None of these

**Answer: B**



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16. A bag contains  $n$  coupons marked  $1, 2, 3, \dots, n$ . If two coupons are drawn, then the chance that the difference of the coupons exceeds  $m$  (less than  $n - 1$ ) is :

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

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

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

D. None of these

**Answer: B**



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17. Probabilities that a plant will live is  $\frac{3}{4}$  and the probability that another plant lives is  $\frac{1}{3}$ . The probability that only one of them lives is :

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

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

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

D. None of these

**Answer: A**



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18. A sample space consists of three mutually independent and equally likely events . The probability of happening of

each one of the them is equal to :

A. 0

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

C. 1

D. None of these

**Answer: B**



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**19.** For any two independent events  $E_1$  and  $E_2$  in a space  $S$  ,

$P[(E_1 \cup E_2) \cap (\overline{E_1} \cap \overline{E_2})]$  is :

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

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



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

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

**Answer: A**

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**20.** One bag contains 6 blue and 5 green balls and another bag contains 7 blue and 4 green balls . Two balls are drawn , one from each bag . The probability of both being blue is :

A.  $\frac{42}{121}$

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

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

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

**Answer: A**



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**21.** For any two events  $A$  and  $B$ ,  $P(A \cap B)$  is :

A. Less than  $P(A) + P(B) - 1$

B. 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: C**



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22. Tickets are numbered 1 to 100 . They are well - shuffled and a ticket is drawn at random . Probability that the drawn ticket has a number 5 or a multiple of 5 is :

A.  $\frac{1}{10}$

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

C.  $\frac{1}{25}$

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

**Answer: B**



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23. There are two boxes . One box contains 3 white balls and 2 black balls . The other box contains 7 yellow balls and 3

black balls . If a box is selected at random and from it , a ball is drawn , the probability that the ball is black is :

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

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

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

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

**Answer: A**



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**24.** 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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**25.** The chance of throwing an ace in the first out of two successive throws with an ordinary dice is :

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

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

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

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

**Answer: B**



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**26.** A and B are two events such that  $P(A) > 0, P(B) \neq 1$   
then  $P(\bar{A} / \bar{B})$  is equal to :

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

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

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

D.  $P(\bar{A}) / P(\bar{B})$

**Answer: C**



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27. A coin is tossed three times in succession . If E is the event that there are atleast two heads and F is the event in which first throw is a head , then  $P(E/F) =$

A.  $3/4$

B.  $3/8$

C.  $1/2$

D.  $1/8$

**Answer: A**



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

A.  $13/32$

B.  $1/4$

C.  $1/32$

D.  $3/16$

**Answer: A**



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29. A fair coin is tossed repeatedly . If tail appears on first four tosses, then the probability of head appearing on fifth toss equals :

A.  $1/2$

B.  $1/32$

C.  $31/32$

D.  $1/5$

**Answer: A**



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30. If  $\bar{E}$  and  $\bar{F}$  are complementary events of events E and F respectively and  $0 < P(F) < 1$ , then :

A.

$$P(E/F) + P(\bar{E}/F) = 1 \text{ or } P(E/\bar{F}) + P(\bar{E}/\bar{F}) = 1$$

B.  $P(E/F) + P(E/\bar{F}) = 1$

C.  $P(\bar{E}/F) + P(E/\bar{F}) = 1$

D. None of these

**Answer: A**



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**31.** If  $E$  and  $F$  are events with

$P(E) \leq P(F)$  and  $P(E \cap F) > 0$  then :

A. occurrence of  $E \Rightarrow$  occurrence of  $F$

B. occurrence of  $F \Rightarrow$  occurrence of  $E$

C. non occurrence of E  $\Rightarrow$  non occurrence of F

D. None of the above implication holds .

**Answer: D**

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32. For any two independent events

$E_1$  and  $E_2$ ,  $P\{(E_1 \cup E_2) \cap (\bar{E}_1 \cap \bar{E}_2)\}$  is

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

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

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

D. None of these

**Answer: A**



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33. For any two events A and B ,

$P(A \cup B) \cap (\bar{A} \cap \bar{B})$  is :

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

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

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

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

**Answer: A**



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**34.** 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 of these

**Answer: C**



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**35.** 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 of these

**Answer: C**



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**36.** In tossing 10 coins , the probability of getting exactly 5 heads is :

A.  $\frac{9}{128}$

B.  $\frac{63}{256}$

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

D.  $\frac{193}{256}$

**Answer: B**

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**37.** A binomial probability distribution is symmetrical if  $p$ , the probability of success in a single trial is :

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

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

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

D. less than  $q$ , where  $q = 1 - p$

**Answer: C**



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**38.** Let  $X$  and  $Y$  be two random variables . The relationship  $E(XY) = E(X) E(Y)$  holds :

- A. Always
- B. If  $E(X+Y) = E(X) + E(Y)$  is true
- C. If  $X$  and  $Y$  are independent
- D. If  $X$  can be obtained from  $Y$  by a linear transformation .

**Answer: C**



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39. If  $X$  denotes the number of sixes in four consecutive throws of a dice, then  $P(X=4)$  is :

A.  $\frac{1}{1296}$

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

C. 1

D.  $\frac{1295}{1296}$

**Answer: A**



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40. If the mean of the binomial distribution is 20 and standard deviation is 4, then the number of events is :

A. 50

B. 25

C. 100

D. 80

**Answer: C**



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**41.** If mean of a binomial distribution is 3 and its variance is

$\frac{3}{2}$ , then number of trials is :

A. 6

B. 2

C. 12

D. None of these

**Answer: A**



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42. If the mean of a Poisson's Distribution is  $\lambda$  , then is standard deviation is :

A.  $\lambda$

B.  $\lambda^2$

C.  $\sqrt{\lambda}$

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

**Answer: C**



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43. A coin is tossed 8 times . The probability of getting a head three times is :

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

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

C.  $\frac{7}{128}$

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

**Answer: D**



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44. One hundred identical coins , each with probability  $p$  of showing up 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 value of p is :

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

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

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

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

**Answer: D**



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**45.** The total area under the standard normal curve is :

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

B. 2

C. 1

D. None of these

**Answer: C**



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**46.** The mean and variance of a binomial variate  $X$  are 2 and 1 respectively, then the probability that  $X$  takes a value greater than is :

A.  $2/3$

B.  $4/5$

C.  $7/8$

D.  $15/16$

**Answer: D**



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**47.** Two dice are thrown , the probability that the sum of the points on two dice will be 7 is :

A.  $\frac{5}{26}$

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

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

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

**Answer: B**



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**48.** In 324 throws of 4 dice , the expected number of times three sixes occur is :

A. 81

B. 31

C. 5

D. 9

**Answer: C**

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**49.** A random variable  $X$  is specified by the following distribution law :



$x$	2	3	4
$P(X = x)$	0.3	0.4	0.3

Then the variance of this distribution is :

A. 0.6

B. 0.7

C. 0.77

D. 0.55

**Answer: A**

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**50.** A random variable  $X$  has the following probability distribution :

$x$	:0	1	2	3	4	5	6	7	8
$P(X = x)$	$a$	$3a$	$5a$	$7a$	$9a$	$11a$	$13a$	$15a$	$17a$

then the value of  $a$  is :

A.  $\frac{1}{81}$

B.  $\frac{2}{81}$

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

D.  $\frac{7}{81}$

**Answer: A**



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**51.** A box contains 100 bulbs, out of which 10 are defective. A sample of 5 bulbs is drawn. The probability that none is defective is

A.  $10^{-5}$

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

C.  $\left(\frac{9}{10}\right)^5$

D.  $\frac{9}{10}$

**Answer: C**



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**52.** If the mean and variance of a binomial distribution are 2 and  $\frac{4}{3}$ , then the value of  $P(X = 0)$  is :

A.  $64/729$

B.  $8/729$

C.  $1/729$

D.  $1/8$

**Answer: A**



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**53.** The probability that an event A happens in one trial of an experiment is  $0.40$  . Three independent trials of the experiment are performed . The probability that the event A happens at least once is :

A.  $0.936$

B.  $0.784$

C.  $0.904$

D. None of these

**Answer: B**





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54. The mean and S.D of a Binomila distribution are respectively 10 and 2 . Then the value of q is :

A. 1

B. 0.8

C. 0.6

D. 0.4

**Answer: D**



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55. The probability that a person will hit a target in shooting practices is 0.3 . If he shoots 10 times , then the probability of his shooting the target is :

A. 1

B.  $1 - (0.7)^{10}$

C.  $(0.7)^{10}$

D.  $(0.3)^{10}$

**Answer: B**



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56. A random variable  $x$  has the following point distribution :

$x:$	0	1	2	3	4	5	6	7
$p(x):$	0	$p$	$2p$	$2p$	$3p$	$p^2$	$2p^2$	$7p^2$

+p

The value of p is :

A.  $-\frac{1}{10}$

B.  $-1$

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

D. complex number

**Answer: C**



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**57.** A random variable X is defined by :

$$X = \begin{cases} 3 & \text{with probability} = 1/3 \\ 4 & \text{with probability} = 1/4 \\ 12 & \text{with probability} = 5/12 \end{cases}$$

Then  $E(X)$  is :

A. 6

B. 7

C. 5

D. 8

**Answer: B**



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**58.** An unbiased die with faces marked 1,2,3,4,5 and 6 is rolled four times . Out of four values obtained , the probability that the minimum face value is not less than 2 and the maximum face value is not greater than 5 is :

A.  $\frac{16}{81}$



B.  $\frac{1}{81}$

C.  $\frac{80}{81}$

D.  $\frac{65}{81}$

**Answer: A**

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**59.** 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 :

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

B.  $\frac{18}{108}$

C.  $\frac{30}{108}$

D.  $\frac{48}{108}$

**Answer: D**



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**60.** Dialing a telephone number an old man forgets the last two digits remembering only that these are different , dialling at random . The probability that the number dialled coorectly is :

A.  $\frac{1}{45}$

B.  $\frac{1}{90}$

C.  $\frac{1}{100}$

D. None of these

**Answer: B**



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**61.** A coin is tossed three times

Events A : two heads come

Event B : last should be head .

Then A and B are :

A. independent

B. dependent

C. both

D. None of these

**Answer: B**



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**62.** The probability for a randomly chosen month to have its 10th day as Sunday is :

A.  $\frac{1}{84}$

B.  $\frac{10}{12}$

C.  $\frac{10}{84}$

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

**Answer: D**

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**63.** In a non - leap year the probability of getting 53 Sundays or 53 Tuesday or 53 Thursdays is :

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

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

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

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

**Answer: C**



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**64.** The probability of occurrence of a multiple of 2 n one dice and a multiple of 3 on the order dice if the both are thrown together , is :

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

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

C.  $\frac{71}{36}$

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

**Answer: B**



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**65.** If A and B are two mutually exclusive events , then :

A.  $P(A) < P(\bar{B})$

B.  $P(A) > P(\bar{B})$

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

D. None of these

**Answer: D**



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**66.** The probability of India winning a test match against West Indies is  $\frac{1}{2}$ . Assuming independence from match to match the probability that in a match series India's second win occurs at the third test is :

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

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

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

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

**Answer: B**



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67. A and B play a game where each is asked to select a number from 1 to 25 . If the two numbers match ,both of them win a prize . The probability that they will not win a prize in a straight trial is :

A.  $\frac{1}{25}$

B.  $\frac{24}{25}$

C.  $\frac{2}{25}$

D. None of these

**Answer: B**

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68. A fair die is tossed eight times . The probability that a thrid six is oberved on the 8th throw is :

A.  $\frac{{}^7 C_2 \times 5^5}{6^7}$

B.  $\frac{{}^7 C_2 \times 5^5}{6^8}$

C.  $\frac{{}^7 C_2 \times 5^5}{6^6}$

D. None of these

**Answer: B**



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69. A dice is tossed 5 times . Getting an odd number is considered a success . Then the variance of distribution of number of successes is :

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

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

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

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

**Answer: D**



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

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

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

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

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

**Answer: C**



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71.  $P(B) = \frac{3}{4}$ ,  $P(\bar{A} \cap B \cap \bar{C}) = \frac{1}{3}$ .  $P(A \cap B \cap \bar{C}) = \frac{1}{3}$

then  $P(B \cap C)$  :

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

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

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

D.  $\frac{23}{36}$

**Answer: A**



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72. A random variable  $X$  has the probability distribution :

$X:$	1	2	3	4	5	6	7	8
$P(X):$	0.15	0.23	0.12	0.10	0.20	0.08	0.07	0.05

For the events  $E = \{X \text{ is a prime number} \}$  and  $F = \{X < 4\}$ ,

the probability  $P(E \cup F)$  is :

A. 0.87

B. 0.77

C. 0.35

D. 0.50

**Answer: B**



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73. The mean and variance of a binomial distribution are 4 and 2 respectively . Then the probability of 2 successes is :

A.  $\frac{37}{256}$

B.  $\frac{219}{256}$

C.  $\frac{128}{256}$

D.  $\frac{28}{256}$

**Answer: D**

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74. If three distinct numbers are chosen randomly from the first 100 natural numbers , then the probability that all three of them are divisible by 2 and 3 is :

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

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

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

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

**Answer: D**



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

A. equally likely but not independent

B. equally likely and mutually exclusive

C. mutually exclusive and independent

D. independent but not equally likely .

**Answer: D**



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

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

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

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

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

**Answer: A**



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77. A fair die is thrown till we get . Then the probability of getting 1 in exactly even number of trials is :

A.  $\frac{11}{36}$

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

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

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

**Answer: B**





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**78.** At a telephone enquiry system the number of phone calls regarding relevant enquiry follow Poisson distribution with an average of 5 phone calls during 10 - minute time intervals . The probability that there is at the most one phone call during a 10 - minute time period is :

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

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

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

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

**Answer: D**



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79. Two aeroplanes I and II bomb a target in succession . The probabilities of I and II scoring a hit correctly are 0.3 and 0.2 respectively . The second plane will bomb only if the first misses the target . The probability that the target is hit by the second plane is :

A. 0.14

B. 0.2

C. 0.7

D. 0.06

**Answer: A**



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## Multiple Choice Questions Level II

1. LET A and B be the events such that  $P(A) = 0.3$  and  $P(A \cup B) = 0.8$  . If A and B are independent events , then P(B) is :

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

B.  $\frac{5}{7}$

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

D. None of these

**Answer: B**



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2. The probability that a man aged  $x$  years will die in a year is  $p$ . The probability that out of  $n$  men  $A_1, A_2, A_3, \dots, A_n$  each aged  $x$ ,  $A_1$  will die and be first to die is :

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

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

C.  $\frac{1}{n^2} [1 - (1 - p)^n]$

D.  $\frac{1}{n} [1 - (1 - p)^n]$

**Answer: D**



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3. A determinant is chosen at random from the set of all determinants of order 2 with elements  $-1$  and  $1$  only. The

probability that the value of the determinant chosen is positive is :

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

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

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

D.  $\frac{2}{16}$

**Answer: C**



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4. The probability that a man lives after 10 years is  $\frac{1}{4}$  and that his wife is alive after 10 years is  $\frac{1}{3}$ . The probability that neither of them is alive after 10 years is :

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

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

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

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

**Answer: A**



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5. The probability of occurrence of an event A is  $\frac{5}{9}$ . The probability of non - occurrence of the event B is  $\frac{5}{11}$ . The probability that at least one of them will occur is :

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

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

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

D. 0.8

**Answer: D**

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6. Out of 21 ticket marked 1,2....21 , three are drawn at random without replacement . The probability that these numbers are in A.P is :

A.  $\frac{9}{15}$

B.  $\frac{13}{261}$

C.  $\frac{14}{261}$

D.  $\frac{10}{133}$

**Answer: D**



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7. Two persons throw a pair of dice alternatively till one gets a total of 9 and wins the game . If A has the first throw , then the probability that A wins the game is :

A.  $\frac{9}{17}$

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

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

D. None of these

**Answer: A**



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8. If A and B are two events with

$P(A) = \frac{1}{4}$ ,  $P(A/B) = \frac{1}{4}$  and  $P(B/A) = \frac{1}{2}$  then :

A. A and B are mutually exclusive

B. A and B are independent

C. A is sub - event of A

D. B is sub - event of A .

**Answer: B**



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9. A person has a bunch of n keys , only one of which exactly fits a lock . The person tries to open the lock by trying the

keys at random . The probability that he opens the lock is at the  $k$ th attempt on the assumption that he rejects the keys already tried is :

A.  $k/n$

B.  $1/n$

C.  $\frac{k - 1}{n}$

D. None of these

**Answer: B**



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10. The probability of India winning a test match against Indies is  $\frac{1}{2}$  .Assuming independence from match to match ,

the probability that in a 5 match series India's second win occurs at third test is :

A.  $1/3$

B.  $1/4$

C.  $2/3$

D.  $1/2$

**Answer: C**



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**11.** Three of the six vertices of a regular hexamgon are chosen at random . The probability that the triangle with three vertices is equilateral , equals :

A.  $1/20$

B.  $1/10$

C.  $1/5$

D. None of these

**Answer: B**



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**12.** The chance of throwing a total of 3 or 5 or 11 with two dice

is :

A.  $5/36$

B.  $1/9$

C.  $2/9$

**Answer: C**



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**13.** Four persons are chosen at random from a group containing 3 men , 2 women and 4 children . The chance that exactly 2 of them will be children is :

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

B.  $\frac{9}{21}$

C.  $\frac{10}{21}$

D.  $\frac{11}{21}$

**Answer: D**



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14. A box contains 3 white and 2 red balls . If we draw one ball and without replacing the first , the probability of his travelling by train or plane is :

A.  $8/25$

B.  $2/5$

C.  $3/5$

D.  $21/25$

**Answer: B**



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15. 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 :

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

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

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

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

**Answer: B**



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16. There are four machines and it is known that exactly two of them are faulty machines are identified . Then the

probability that only two tests are needed is :

A.  $1/3$

B.  $1/6$

C.  $1/2$

D.  $1/4$

**Answer: B**



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**17.** 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 :



A.  $1/12$

B.  $1/6$

C.  $1/2$

D.  $5/9$

**Answer: D**



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**18.** If  $P(A) = 65$  ,  $P(B) = 80$  , then  $P(A \cap B)$  lies in the interval :

A.  $[.30.80]$

B.  $[.35.75]$

C.  $[40.70]$

D.  $[.45.65]$

**Answer: D**



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**19.** A problem in mathematics is given to three students A, B, C and their respective probability of solving the problem is  $\frac{1}{2}$ ,  $\frac{1}{3}$  and  $\frac{1}{4}$ . Probability that the problem is solved is :

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

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

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

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

**Answer: A**



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20. Events A,B,C are mutually exclusive events such that

$$P(A) = \frac{3x + 1}{3}, P(B) = \frac{1 - x}{4} \text{ and } P(C) = \frac{1 - 2x}{2} .$$

The set of possible values of x are in the interval :

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

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

C.  $[0, 1]$

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

**Answer: D**



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

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

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

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

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

**Answer: C**



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22. Two numbers are chosen from  $[1,2,3,4,5,6]$  one after another without replacement. Find the probability that one

of the smaller value of two is less than 4 :

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

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

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

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

**Answer: A**



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**23.** A random variable  $X$  has Poisson distribution with mean 2 .

Then  $P(X > 1.5)$  equals :

A. 0

B.  $\frac{2}{e^2}$

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

D.  $1 - \frac{3}{e^2}$

**Answer: D**

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

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

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

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

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

**Answer: C**



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25. A pair of four dice is thrown independently three times .

The probability of getting a score of exactly 9 twice is :

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

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

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

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

**Answer: C**



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26. It is given that events A and B are such that :

$$P(A) = \frac{1}{4}, P(A/B) = \frac{1}{2} \text{ and } P(B/A) = \frac{2}{3} . \text{ Then } P(B)$$

is :

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

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

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

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

**Answer: C**



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27. A die is thrown . Let A be the event that the number obtained is greater than 3 . Let B be the event that the number obtained is less than 5 . Then  $P(A \cup B)$  is :

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

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

C. 0

D. 1

**Answer: D**



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28. Let  $E^c$  denote the complement of an event E . Let E,F ,G be pair - wise independent events with

$$P(G) > 0 \text{ and } P(E \cap F \cap G) = 0$$

Then

$P(E^C \cap F^C / G)$  equals :

A.  $P(E^C) + P(F^C)$

B.  $P(E^C) - P(F^C)$

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

D.  $P(E) - P(F^C)$

**Answer: C**



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**29.** 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 :

A.  $\frac{1}{\log_{10}^2 - \log_{10}^3}$

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

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

D.  $\frac{4}{\log_{10}^4 + \log_{10}^3}$

**Answer: A**



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**30.** One ticket is selected at random from 50 tickets numbered 00,01,02.....49 . Then the probability that the sum of the digits on the selected ticket is 8 , given that the product of these digits is zero , equals :

A.  $1/14$

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

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

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

**Answer: A**



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## Latest Questions From Aieee Jee Examinations

1. 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 colours is :

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

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

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

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

**Answer: B**

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

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

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

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

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

**Answer: C**

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3. Let  $\omega$  be a complex cube a root of 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 :

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

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

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

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

**Answer: C**

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4. If C and D are two events such that  $C \subset D$  and  $P(D) \neq 0$ , then the correct statement among the following is :

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

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

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

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

**Answer: B**



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5. Consider 5 independent Bernoulli's trials , each with probability of success  $p$  . If the probability of at least one failure is greater  $p$  , If the probability of at least one failure is greater than or equal to  $\frac{31}{32}$  , then  $p$  lies in the interval :

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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6. Let  $A, B, C$  be pairwise independent events with  $P(C) > 0$  and  $P(A \cap B \cap C) = 0$  Then  $P(A^C B^C / C)$  is :

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

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

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

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

**Answer: D**

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7. Three numbers are chosen at random without replacement from  $\{1, 2, 3, \dots, 8\}$ . The probability that their minimum is 3, given that their maximum is 6, is :

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

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

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

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

**Answer: B**



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

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

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

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

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

**Answer: A**



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9. Let  $X$  and  $Y$  be two events such that :  
 $P(X/Y) = \frac{1}{2}$ ,  $P(Y/X) = \frac{1}{3}$  and  $P(X \cap Y) = \frac{1}{6}$  .

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

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

**Answer: A::B**



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**10.** A ship is fitted with three engines  $E_1, E_2$  and  $E_3$ . The engines function independently of each other with respective probabilities  $\frac{1}{2}, \frac{1}{4}$  and  $\frac{1}{6}$ .

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 ?

$$A. P(X_1^C / X) = \frac{3}{16}$$

B.  $P(\text{Exactly two engines of the ship are functioning} / X)$

$$= \frac{7}{8}$$

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

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

**Answer: B::D**



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**11.** Four persons independently solve a certain problem correctly with probabilities  $\frac{1}{2}, \frac{3}{4}, \frac{1}{4}, \frac{1}{8}$ . Then the probability that the problem is solved correctly by at least one of them is :

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

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

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

D.  $\frac{253}{259}$

**Answer: A**

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

A. equally likely but not independent

B. independent but not equally likely

C. independent and equally likely

D. mutually exclusive and independent .

**Answer: B**

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

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

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

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

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

**Answer: A**



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## Recent Competitive Questions Questions From Karnataka Cet Comed

1. A and B are two such that  $P(A) \neq 0, P(B/A)$  if : (i) A is subset of B (ii)  $A \cap B = \phi$  are respectively :

A. 0,1

B. 1,0

C. 1,1

D. 0,0

**Answer: B**





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2. Two dice are thrown simultaneously, the probability of obtaining a total score of 5 is

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

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

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

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

**Answer: C**



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3. If the events A and B are independent if  $P(A') = \frac{2}{3}$  and  $P(B') = \frac{2}{7}$ , then  $P(A \cap B)$  is equal to

A.  $\frac{5}{21}$

B.  $\frac{3}{21}$

C.  $\frac{4}{21}$

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

**Answer: A**



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4. A box contains 100 bulbs, out of which 10 are defective. A sample of 5 bulbs is drawn. The probability that none is defective is

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

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

C.  $\frac{9}{10}$

D.  $\left(\frac{9}{10}\right)^5$

**Answer: D**



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5. If two dice are thrown simultaneously, then the probability that the sum of the numbers which come up on 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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6. A man takes a step forward with probability 0.4 and one step backward with probability 0.6 , then the probability that at the end of eleven steps he is one step away form the starting point , is

A.  ${}^{11}C_5 \times (0.48)^5$

B.  ${}^{11}C_6 \times (0.24)^5$

C.  ${}^{11}C_5 \times (0.12)^5$

D.  ${}^{11}C_6 \times (0.72)^6$

**Answer: B**



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7. A box contains 6 red numbers from 1 through 6 and 4 white marbles 12 through 15 . Find the probability that a marble drawn 'at random ' is white and odd number :

A. 5

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

C. 6

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

**Answer: B**



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8. 6 boys and 6 girls in a row at random . The probability that all girls sit together is :

A.  $\frac{1}{432}$

B.  $\frac{12}{431}$

C.  $\frac{1}{132}$

D. None of these

**Answer: C**



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9. An urn contains 9 balls , 2 of which are white , 3 blue and 4 black . 3 balls are drawn at random form the urn . The chance that 2 balls will be of the same colour and the third of a different colour is :

A.  $\frac{45}{84}$

B.  $\frac{55}{84}$

C.  $\frac{35}{84}$

D.  $\frac{25}{84}$

**Answer: B**



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10. Three dice are rolled once . The chance of getting a score of 5 is :

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

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

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

D.  $\frac{1}{7^2}$

**Answer: C**



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11. A bag contains 3 white , 4 black , 2 red balls . If 2 balls are drawn at random , then the probability that both the balls are white is :



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

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

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

D.  $\frac{1}{24}$

**Answer: C**



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