MATHS

BOOKS - DHANPAT RAI & CO MATHS (HINGLISH)

DISCRETE PROBABILITY DISTRIBUTIONS

Illustration

1. If the probability of a random variable X is a given below :

$X = x:$	-2	-1	0	1	2	3
$P(X = x):$	$\frac{1}{2}$	k	$\frac{1}{5}$	$2k$	$\frac{3}{10}$	k

Then the value of k, is :

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

B. $\frac{2}{10}$

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

D. $\frac{7}{10}$

Answer: A

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2. A random variable X takes the values $0, 1, 2, 3, \ldots,$ with prbability $PX(= x) = k(x + 1)\left(\frac{1}{5}\right)^x$, where k

is a constant, then $P(X = 0)$ is.

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

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

C. $\frac{18}{25}$

D. $\frac{19}{25}$

Answer: B

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3. If random variable X has the following probability distribution :

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

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

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

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

Answer: D

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4. A random variable X has the following 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	0.08

for the events $E =$ [X is a prime number] $F = \{X < 4\}$, the probability $P(EOP)$, is.

A. 0.50

B. 0.77

C. 0.35

D. 0.87

Answer: B

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5. A random, variable X has the following probability distribution: $X: \ 0\ 1\ 2\ 3\ 4\ 5\ 6\ 7$

$P(X): 0 \;\; k \; 2k \;\; 2k \; 3k \;\; k^2 \;\; 2k^2 \;\; 7k^2 + k$ Find each of the following: k ii. $P(X < 6)$ iii. $P(\;|\; X \geq 6)$ iv. `P(0

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

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

C. $\frac{9}{100}$

D. $\frac{91}{100}$

Answer: A

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6. A random variate X takes the values 0, 1, 2, 3 and its mean is 1.3. If $P(X = 3) = 2P(X = 1)$ and

$P(X = 2) = 0.3$, then $P(X = 0)$ is equal to

A. 0.1

B. 0.2

C. 0.3

D. 0.4

Answer: D

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7. A random varibale X has the following probability distribution.

$X:$	1	2	3	4	5
$P(X):$	0	0.1	0.2	0.3	0.4

The mean and standard deviation of X are respectively.

A. 2 and 3

B. 3 and 1

C. 3 and $\sqrt{2}$

D. 2 and 1

Answer: B

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8. Five coins are tossed simultaneously. The probability that at least on head turning up, is

A. $1/32$

B. $5/32$

C. $7/16$

D. $31/32$

Answer: D

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9. The probability that a marksman will hit a target is given is 1/5. Then the probability that at least once hit in 10 shots is $1-(4/5)^{10}$ b. $1/5^{10}$ c. $1-(1/5)^{10}$ d. $(4/5)^{10}$

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

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

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

D. none of these

Answer: A

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

A. 0.936

B. 0.784

C. 0.904

D. none of these

Answer: B

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11. एक प्रयोग के सफल होने का संयोग उसके असफल होने से दो गुना है। प्रायिकता ज्ञात कीजिए कि अगले छः परीक्षणों में कम से कम 4 सफल होंगे।

A. $\frac{496}{729}$

B. $\frac{233}{729}$

C. $\frac{432}{729}$

D. $\frac{256}{729}$

Answer: A

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12. 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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13. A man takes a step forward with probability 0.4 and backward with probability 0.6. The probability that at the end of eleven steps he is just one step away from the starting point, is

A. $.^{11}(C)_5(0.4)^6(0.6)^5$

B. $.^{11}(C)_6(0.4)^5(0.6)^6$

C. $.^{11}(C)_5(0.4)^5(0.6)^6$

D. $.^{n}(C)_{5}(0.4)^{5}(0.6)^{5}$

Answer: C

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14. 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) 0.8750 (b) 0.0875 (c) 0.0625 (d) 0.0250

A. $\frac{1}{80}$

B. $\frac{7}{80}$

C. $\frac{7}{8}$

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

Answer: B

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15. The probability of India winning a test match againest England is $\frac{2}{3}$. Assuming independence from match to match, the probability that in a 7 match series India's third win occurs at the fifth match, is

A. $\frac{8}{27}$

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

C. $\frac{8}{81}$

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

Answer: B

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16. The mean and variance of a random variable X having a binomial distribution are $4 \text{ and } 2$ respectively. The $P(X = 1)$ is

A. $1/4$

B. $1/32$

C. $1/16$

D. $1/8$

Answer: B

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17. A die is thrown 100 times. If getting an even numebr is considered a success, the variance of the number of successes, is

A. 50

B. 25

C. 10

D. 100

Answer: B

18. In eight thows of a die 1 or 3 is considered a success. Then, the standard deviation of success, is

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

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

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

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

Answer: C

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19. A die is tossed 5 times. Getting and odd number is cosidered a success. Then, the variance of distribution of success, is

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

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

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

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

Answer: D

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20. A box contains 15 green and 10 yellow balls. If 10 balls are randomly drawn, one-by-one, with replacement, then the variance of the number of green balls drawn is : (a) $\frac{12}{5}$ (b) 6 (c) 4 (d) $\frac{6}{25}$

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

B. 6

C. 4

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

Answer: A

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Section I Solved Mcqs

1. In a box containing 100 bulbs, 10 are defective. The probability that out of a sample of 5 bulbs, none is defective is(A) 10-1 (B) $\left(\frac{1}{2}\right)^5$ (C) $\left(\frac{9}{10}\right)^5$ (D) $\frac{9}{10}$

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

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

C. 10^{-5}

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

Answer: A

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2. If in a binomial distribution $n = 4,\ P(X = 0) = \frac{16}{81},\ then\ P(X = 4)$ equals $\frac{1}{16}$ b. $\frac{1}{81}$ c. $\frac{1}{27}$ d. $\frac{1}{8}$

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

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

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

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

Answer: B

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3. A rifleman is firing at a distance target and hence has only 10% chance of hitting it. Find the number of rounds; he must fire in order to have more than 50% chance of hitting it at least once.

A. 11

B. 9

C. 7

D. 5

Answer: C

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4. A fair coin is tossed a fixed number of times. If the probability of getting seven heads is equal to that of getting nine heads, the probability of getting two heads, is

A. $15/2^8$

B. $2/15$

C. $15/2^{13}$

D. none of these

Answer: C

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5. A fair coin is tossed 100 times. The probability of getting tails an odd number of times is $1/2$ b. $1/8$ c. $3/8$ d. none of these

A. $1/2$

B. $1/8$

C. $3/8$

D. none of these

Answer: A

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6. A fair die is thrown 20 times. The probability that on the 10th throw, the fourth six appears is

ˆ $20C_{10} \times 5^6/6^{20}$ b. $120 \times 5^7/6^{10}$ c. $84 \times 5^6/6^{10}$ d. none of these

A. $\frac{.^{20}C_{10} \times 5^5}{6^{20}}$

B. $\frac{120 \times 5^7}{6^{10}}$

C. $\frac{84 \times 5^6}{6^{10}}$

D. none of these

Answer: C

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7. If X is a binomial variate with parameters n and p, where $0 > p >$ such that $\frac{P(X=r)}{P(X=n-r)}$ is independent of n and r, then p equals.

A. $1/2$

B. $1/3$

C. $1/4$

D. none of these

Answer: A

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8. Let X denote the number of times heads occur in n tosses of a fair coin. If $P(X=4),\ P(X=5)\ and\ P(X=6)$ are in AP; the value of n is $7, 14$ b. $10, 14$ c. $12, 7$ d. $14, 12$

A. 7,14

B. 10,14

C. 12,7

D. 14,12

Answer: A

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9. 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 the value of p is

A. $1/2$

B. $51/101$

C. $49/101$

D. none of these

Answer: B

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10. A fair coin is tossed 99 times. If X is the number of times heads occur, then $P(X = r)$ is maximum when r is $49, 50$ b. $50, 51$ c. $51, 52$ d. none of these

A. 49,50

B. 50,51

C. 51,52

D. none of these

Answer: A

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11. A coin is tossed n times. The probability of getting head at least once is greater than 0.8. Then the least value of n is

A. 7

B. 6

C. 5

D. 3

Answer: D

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12. If the mean and the variance of a binomial variable X are 2 and 1 respectively, then the probability that X takes a value greater than one is equal to:

A. $2/3$

B. $4/5$

C. $7/8$

D. $15/16$

Answer: D

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13. A biased coin with probability p, $0 < p < 1$ of heads is tossed until a head appears for the first time. If the probability that the number of tosses required is even is 2/5, then p equals

A. $1/3$

B. $2/3$

C. $2/5$

D. $3/5$

Answer: A

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14. If X follows a binomial distribution with parameters $n = 8$ and $p = 1/2$, then $p(|X - 4| \leq 2)$ equals

A. $\frac{118}{128}$

B. $\frac{119}{128}$

C. $\frac{117}{128}$

D. none of these

Answer: B

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15. If X follows a binomial distribution with parameters $n = 100$ and $p = \frac{1}{3}$, then $P(X = r)$ is maximum

when

A. 32

B. 34

C. 33

D. 31

Answer: C

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16. A fair die is tossed eight times. The probability that a third six is observed in eight throw is $\frac{{}^7C_{10} \times 5^7}{6^7}$ b. $\frac{{}^7C_2 \times 5^2}{6^8}$ c. $\frac{{}^7C_2 \times 5^5}{6^6}$ d. none of these

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

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

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

D. none of these

Answer: B

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

A. $1/8$

B. $1/4$

C. $1/2$

D. none of these

Answer: C

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18. A dice is thrown $(2n+1)$ times. The probability that faces with even numbers show odd number of times is

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

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

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

D. none of these

Answer: A

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

A. $1/2$

B. $1/32$

C. `31//32

D. $1/16$

Answer: D

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20. An ordinary dice is rolled a certain number of times. If the probability of getting an odd number 2 times is equal to the probability of getting an even numebr 3 times. Then the probability of getting an odd number and odd number of times, is

A. $1/32$

B. $5/16$

C. $1/2$

D. none of these

Answer: C

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21. A coin is tossed 3n times. The chance that the number of times one gets head is not equal to the number of times one gets tail, is

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

B. $1-.^{2n}C_n$

C. $1 - .^{2n}C_n\left(\frac{1}{4^n}\right)$

D. none of these

Answer: C

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22. A card is drawn from a pack of 52 playing cards. The card is replaced and the pack is reshuffled. If this is done six times. The probability that 2 hearts, 2 diamond and 2 black cards are drawn is

A. $90 \times \left(\frac{1}{4}\right)^6$

B. $\frac{45}{2} \times \left(\frac{3}{4}\right)^4$

C. $90 \times \left(\frac{1}{2}\right)^{10}$

D. none of these

Answer: C

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23. From a box containing 20 tickets marked with numbers 1 to 20, four tickets are drawn one by one. After each draw, the ticket is replaced. The probability that the largest value of tickets drawn is 15 is.

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

B. $\frac{27}{320}$

C. $\frac{27}{1280}$

D. none of these

Answer: B

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24. A coin is tossed 3 times by 2 persons. The prbability that both get equal number of heads, is

A. $3/8$

B. $1/9$

C. $5/16$

D. none of these

Answer: C

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25. The mean and the variance of a binomial distribution are 4 and 2 respectively.then, the probabitly of 2 , successes is

A. $28/256$

B. $219/256$

C. $128/256$

D. $37/256$

Answer: A

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26. If two coins are tossed five times, thenthe probability of getting 5 heads and 5 tails is

A. $63/256$

B. $1/1024$

C. $2/205$

D. $9/64$

Answer: A

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27. If X and Y are independent binomial vatiates $B\left(5, \frac{1}{2}\right)$ and $B\left(7, \frac{1}{2}\right)$ and the value of $P(X+Y=3)$ is

A. $35/47$

B. $55/1024$

C. $220/512$

D. $11/204$

Answer: B

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

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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29. Two cards are drawn successively with replacement from a well shuffled deck of 52 cards, then the meanof the number of aces is

A. $1/13$

B. $3/13$

C. $2/13$

D. none of these

Answer: C

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30. A die is thrown 100 times, getting an even number is considered a success. The variance of the number of successes is

A. 10

B. 25

C. 18

D. 12

Answer: B

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31. There are 12 white and 12 red ball in a bag. Balls are drawn one by one with replacement from the bag. The probability that 7th drawn ball is 4th white, is

A. $1/4$

B. $5/32$

C. $3/16$

D. $5/16$

Answer: B

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32. A die is tossed thrice. If event of getting an even number is a success. Then the probability of getting at least two successes is

A. $7/8$

B. $1/4$

C. $2/3$

D. $1/2$

Answer: D

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33. The mean and variance of a binomial distribution are 4 and 3 respectively. Then the probability of getting exacatly six successes in this distribution, is

A. $.^{16}C_6\left(\frac{1}{4}\right)^6\left(\frac{3}{4}\right)^{10}$

B. $.^{16}C_6\left(\frac{1}{4}\right)^{16}\left(\frac{3}{4}\right)^{20}$

C. $.^{16}C_6\left(\frac{1}{4}\right)^8\left(\frac{3}{4}\right)^{12}$

D. $.^{16}C_9\left(\frac{1}{4}\right)^{16}\left(\frac{3}{4}\right)^{20}$

Answer: A

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34. The sum of of the mean and variance of a binomial distribution is 15 and the sum of their squares is 117. the mean of the distribution is

A. 6

B. 9

C. 3

D. 12

Answer: B

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35. 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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36. A random variable X takes values $-1, 0, 1, 2$ with probabilities $\frac{1+3p}{4}, \frac{1-p}{4}, \frac{1+2p}{4}, \frac{-14p}{4}$ respectively, where p varies over R. Then the minimum and maximum values of the mean of X are respectively

A. $-\frac{7}{4}$ and $\frac{1}{2}$

B. $-\frac{1}{16}$ and $\frac{5}{16}$

C. $-\frac{7}{4}$ and $\frac{5}{16}$

D. $-\frac{1}{16}$ and $\frac{5}{4}$

Answer: D

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

(1) $\frac{13}{3^5}$ (2) $\frac{11}{3^5}$ (3) $\frac{10}{3^5}$ (4) $\frac{17}{3^5}$

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

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

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

D. $\frac{1}{3^5}$

Answer: C

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38. The minimum number of times a fair coin needs to be tossed, so that the probability of getting at least two heads is at least 0.96 is :

A. 7

B. 9

C. 8

D. 5

Answer: C

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39. एक प्रयोग के सफल होने का संयोग उसके असफल होने से दो गुना है। प्रायिकता ज्ञात कीजिए कि अगले छः परीक्षणों में कम से कम 4 सफल होंगे।

A. $\frac{192}{729}$

B. $\frac{256}{729}$

C. $\frac{240}{729}$

D. $\frac{4962}{729}$

Answer: B

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Section Ii Assertion Reason Type

1. Statement -1 : The probability of getting a tail most of the times in 10 tosses of a unbiased coin is $\frac{1}{2}\left\{1-\frac{10!}{2^{10}5!5!}\right\}$.

Statement -2:

$.^2 nC_0 + .^2 nC_1 + .^2 nC_2 + ...^2 nC_n = 2^2 n - 1, n \in N$

.

A. 1

B. 2

C. 3

D. 4

Answer: C

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Exercise

1. A random variable has the following probability dustribution.

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

The value of p, is

A. $1/10$

B. -1

C. $-1/10$

D. none of these

Answer: A

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2. If X is a random -variable with distribution given below :

$x:$	0	1	2	3
$p(x):$	k	$3k$	$3k$	k

The value of k and its variance are

A. $1/8, 22/27$

B. $1/8, 23/27$

C. $1/8, 24/27$

D. $1/8, 3/4$

Answer: D

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3. If in a distribution each x is replaced by corresponding value of $f(x)$, then the probability of getting $f(x)$, when the probability of getting $x_i is p_i$, is.

A. p_i

B. $f(p_i)$

C. $f\left(\frac{1}{p_i}\right)$

D. none of these

Answer: A

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4. A man takes a step forward with probability 0.4 & backward with probability 0.6. Probability that at end of eleven stops he is one step away from starting point is (i). $^{11}C_6(0.24)^6$ (ii) $.^{11}C_6(0.4)^6(0.6)^5$ (iii) $.^{11}C_5(0.4)^5(0.6)^5$ (iv) N.O.T

A. $.^C{}_{\_}(6)(0.24)^5$

B. $.^{11}C_6(0.4)^6(0.6)^5$

C. $.^{11}C_6(0.6)^6(0.4)^5$

D. none of these

Answer: A

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5. 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. 291/364

B. 371/464

C. 471/502

D. 459/512

Answer: D

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6. Six ordinary dice are rolled. The probability that at least half of them will show at least 3 is

A. $41 \times \frac{2^4}{3^6}$

B. $\frac{2^4}{3^6}$

C. $20 \times \frac{2^4}{3^6}$

D. none of these

Answer: A

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7. Two persons each make a single throw with a pair of dice. The probability that the throws are unequal is given by:

A. $\frac{1}{6^3}$

B. $\frac{73}{6^3}$

C. $\frac{51}{6^3}$

D. none of these

Answer: C

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8. If the range ot a random vaniabie X is $0, 1, 2, 3,$ at $P(X = K) = \left(\frac{K+1}{3^k}\right)$ a for $k \geq 0,$ then a equals

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

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

C. $\frac{8}{27}$

D. (16)/(81)`

Answer: B

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9. An experiment succeeds twice as often as it fails. Find the probability that in the next six trails there will be at least 4 successes.

A. $\frac{64}{729}$

B. $\frac{192}{729}$

C. $\frac{240}{79}$

D. $\frac{496}{729}$

Answer: D

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10. The probability that a candidate secure a seat in Engineering through EAMCET is $\frac{1}{10}$ Seven candidate are selected at random from a centre.The probability that exactly two will get seats is

A. $15(0.1)^2(0.9)^5$

B. $20(0.1)^2(0.9)^5$

C. $21(0.1)^2(0.9)^5$

D. $23(0.1)^2(0.9)^5$

Answer: C

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11. Six coins are tossed simultaneously. The probability of getting at least 4 heads, is

A. $11/64$

B. $11/32$

C. $15/44$

D. $21/32$

Answer: B

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12. Fifteen coupens are numbered $1, 2, 3, \ldots 15$ respectively. Seven coupons are selected at random

one at a time with replacement The Probability that the largest number appearing on a selected coupon is 9 is :

A. $\left(\frac{9}{16}\right)^6$

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

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

D. none of these

Answer: D

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13. Two players toss 4 coins each. The probability that they both obtain the same number of heads is $5/256$ b. $1/16$ c. $35/128$ d. none of these

A. $5/256$

B. $1/16$

C. $35/128$

D. none of these

Answer: C

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14. A box contains 24 identical balls of which 12 are white and 12 are black. The balls are drawn at random from the box one at a time with replacement. The probability that a white ball is drawn for the 4th time on the 7th draw is $5/64$ b. $27/32$ c. $5/32$ d. $1/2$

A. $5/64$

B. $27/32$

C. $5/32$

D. $1/2$

Answer: A

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15. Two dice are tossed 6 times. Then the probability that 7 will show an exactly four of the tosses , is

A. $\frac{225}{18442}$

B. $\frac{116}{20003}$

C. $\frac{125}{15552}$

D. none of these

Answer: C

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16. If X follows a binomial distribution with parameters $n = 6$ and p. If $4(P(X = 4)) = P(X = 2)$, then $P =$

A. $1/2$

B. $1/4$

C. $1/6$

D. $1/3$

Answer: D

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17. The number of times a die must be tossed to obtain a 6 at least one with probability exceeding 0.9 is at least

A. 13

B. 19

C. 25

D. none of these

Answer: A

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18. Seven chits are numbered 1 to 7. Four chits are drawn one by one with replacment. The probability that the least number appearing on any selected chit is 5 is :

A. $\left(\frac{3}{7}\right)^4$

B. $\left(\frac{6}{7}\right)^3$

C. $\frac{5 \times 4 \times 3}{7^3}$

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

Answer: A

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19. If the mean of a binomial distribution is 25, then its standard deviation lies in the interval

A. $[0, 5]$

B. $(0, 5]$

C. $[0, 25)$

D. $(0, 25]$

Answer: A

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20. The value of C for which $P(X = k) = Ck^2$ can serve as the probability function of a random varibale

X that takes value $0, 1, 2, 3, 4$, is

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

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

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

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

Answer: A

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21. In order to get a head at least once with probability ≥ 0.9, the minimum number of timesa unbiased coin needs to be tossed is

A. 3

B. 4

C. 5

D. none of these

Answer: B

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22. The probability that a man will hit a target in shooting practise is 0.3. If he shoots 10 times, the probability that he hits the target , is

A. 1

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

C. $(0.7)^{10}$

D. $(0.3)^{10}$

Answer: B

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23. If $AandB$ each toss three coins. The probability that both get the same number of heads is $1/9$ b. $3/16$ c. $5/16$ d. $3/8$

A. $1/9$

B. $3/16$

C. $5/16$

D. $3/8$

Answer: C

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

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

Answer: C

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25. A box contains tickets numbered 1 to 20.3 tickets are drawn from the box with replacement. The probability that the largest number on the tickets is 7, is

A. $\frac{2}{19}$

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

C. $1-\left(\frac{7}{20}\right)^3$

D. none of these

Answer: D

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26. An unbiased coin is tossed is tossed a fixed number of times. If the probability of getting 4 heads equals the probability of getting 7 heads, then the probability of getting 2 heads , is

A. $\frac{55}{2048}$

B. $\frac{3}{4096}$

C. $\frac{1}{1024}$

D. none of these

Answer: A

27. A coin is tossed n times. The probability that head will turn up an odd number of times , is

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

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

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

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

Answer: A

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28. Two coins are tossed five times. The probability that an odd number of heads are obtained, is

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

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

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

D. none of these

Answer: D

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

A. $4/9$

B. $5/9$

C. $1/9$

D. none of these

Answer: B

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30. A fair coin is tossed n times. if the probability that head occurs 6 times is equal to the probability that head occurs 8 times, then find the value of n.

A. 7

B. 14

C. 16

D. 19

Answer: B

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31. An unbiased coin is tossed n times. Let X denote the number of times head occurs. If $P(X=4), P(X=5)$ and $P(X=6)$ are in A.P, then the value of n can be

A. 7,14

B. 10,14

C. 12,7

D. none of these

Answer: A

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32. An unbiased coin is tossed is tossed a fixed number of times. If the probability of getting 4 heads equals the probability of getting 7 heads, then the probability of getting 2 heads , is

A. $55/2048$

B. $1/1024$

C. $3/4096$

D. none of these

Answer: A

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33. A carton contains 20 bulbs ,5 of which are defective. The probability that,if a sample of 3 bulbs in chosen at random from the carton, 2 will be defective, is

A. $1/16$

B. $3/64$

C. $9/64$

D. $2/3$

Answer: C

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34. In a precision bombing attack, there is a 50% chance that any one bomb will strick the target. Two direct hits are required to destroy the target completely. The number of bombs which should be dropped to give a 99% chance or better of completely destroying the target can be

A. 10

B. 11

C. 12

D. none of these

Answer: A

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35. The probability of a man hitting a target is 1/4. How many times must he fire so that the probability of his hitting the target at lest once is greater than 2/3?

A. 3

B. 4

C. 5

D. none of these

Answer: B

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36. IF the mean and S.D. of binomial distribution are 20 and 4 respectively. Than the number of trials , is

A. 50

B. 25

C. 100

D. 80

Answer: B

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37. 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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38. The mean and standard deviation of a binomial variate X are 4 and $\sqrt{3}$ respectively. Then , $P(X \geq 1) =$

A. $1 - \left(\frac{1}{4}\right)^{16}$

B. $1 - \left(\frac{3}{4}\right)^{16}$

C. $1 - \left(\frac{2}{3}\right)^{16}$

D. $1 - \left(\frac{1}{3}\right)^{16}$

Answer: B

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39. The probability distribution of a random variable X is given by.

$X = x:$	0	1	2	3	4
$P(X = x):$	0.4	0.3	0.1	0.1	0.1

The variance of X, is

A. 1.76

B. 2.45

C. 3.2

D. 4.8

Answer: A

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40. For a binimial variate X with n=6, if $P(X=4)=\frac{135}{2^{12}}$ then its variance is

A. $8/9$

B. $1/4$

C. $9/8$

D. 4

Answer: C

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