



MATHS

BOOKS - MARVEL MATHS (HINGLISH)

BERNOULLI TRIALS AND BINOMIAL DISTRIBUTION

Multiple Choice Questions

1. Let p be the probability of happening of an event , and q of its non-happening then the

total chance of r successes in n trials

$$0\leq r\leq n,$$
 is

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

- $\mathsf{B.}^{n}C_{r}.\,p^{r-1}.\,q^{r+1}$
- C. ${}^{n}C_{r}$. P^{r+1} . q^{r-1}
- D. $^{n}C_{r}$. P^{r} . q^{r}

Answer: A



2. IF $X o B(n=10,p) ext{ and } E(X)=5$ then p

and Var(x) are _____.

 $\mathsf{A.}\,0.2$

B.0.8

C. 0.1

D. none of these

Answer: B

3. IF $X \to B(n = 10, p)$ and E(X) = 5

then P and V(x) are .

A.
$$\frac{5}{2}, \frac{7}{2}$$

B. $\frac{1}{2}, \frac{5}{2}$
C. $\frac{3}{2}, \frac{9}{2}$

D. none of these

Answer: B

4. Let X ~ B (n,P). I f E(X) = 5 and Var (x) = 2.5 find

n and p

A. 10,0.5

B. 20,0.4

C. 10,0.4

D. none of these

Answer: A

5. 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



6. In tossing 10 coins, the probability of getting

exactly 5 heads is

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

B. $\frac{9}{128}$
C. $\frac{1}{2}$
D. $\frac{63}{256}$

Answer: D

7. 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.0.216

C.0.784

D. 0.064

Answer: C



8. Mean and variance of a binomial variate X are 4 and 2 respectively Then $P(X = 1) = \dots$

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

B. $\frac{1}{16}$
C. $\frac{1}{8}$
D. $\frac{1}{4}$

Answer: A

9. Mean and variance of a binomial distribution are 4 and 2 respectively . Then probability of 3 successes is

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

B. $\frac{219}{256}$
C. $\frac{7}{64}$
D. $\frac{28}{256}$

Answer: C



10. 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.
$$\frac{5}{16}$$

B. $\frac{9}{16}$
C. $\frac{11}{16}$

D. none of these

Answer: C



11. A contest consist of predicting the result win, draw or defeat of 7 football matches. A sent his entry predicting at random. The probability that his entry will contain exactly 4 correct predictions is

A.
$$\frac{8}{3^7}$$

B. $\frac{16}{3^7}$
C. $\frac{280}{3^7}$
D. $\frac{560}{3^7}$

Answer: C



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

A.
$$41 imes rac{2^4}{3^6}$$

B. $rac{2^4}{3^6}$
C. $20 imes rac{2^4}{3^6}$

D. none of these

Answer: A



13. Given
$$X o B(n=5,p)$$

IF

P(X = 1) = 0.4096 and P(X = 2) = 0.2048, then :P =....

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

B. $\frac{1}{3}$
C. $\frac{1}{4}$

Answer: D



14. If X follows the binomial distribution with parameters n=6 and p and 9p(X=4)=P(X=2), then p is

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

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

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

D. none of these

Answer: C

15. 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



16. For a binomial vareiate X if n=5 and P(X=1)=8P(X=3), then p=

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

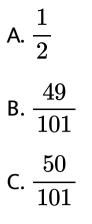
B.
$$\frac{1}{5}$$

C. $\frac{1}{3}$
D. $\frac{2}{3}$

Answer: B



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



Answer: D



18. 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.
$$\frac{15}{2^8}$$

B. $\frac{2}{15}$
C. $\frac{15}{2^{13}}$

D. none of these

Answer: C



19. If a coin is tossed 6 times , then probability

of getting 4 or more haeads is

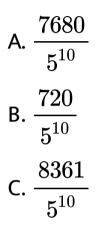
A.
$$\frac{10}{32}$$

B. $\frac{11}{32}$
C. $\frac{12}{32}$
D. $\frac{13}{32}$

Answer: B

20. If X
ightarrow B(n=10, p=0.8)

then :P (at most 3 successes)=...



D. none of these

Answer: D

21. IF X o B(n=9,p=0.8), $then: P(X \ge 6) = rac{4^7}{5^9}(k)$ where k=

A. 109

B. 110

C. 111

D. 112

Answer: A

22. IF X
ightarrow B(n=20, p=0.1) then :P $(X \ge 1) = \dots$ A. $(0.1)^{20}$ $\mathsf{B.1} - (0.1)^{20}$ $\mathsf{C.1} - (0.9)^{20}$ D. $(0.9)^{20}$

Answer: C

23. If X o B(n=10, p=0.5) then : $p(X \ge 9) = ...$

B.
$$\frac{45}{1024}$$

C. $\frac{10}{1024}$

D. none of these

Answer: D

24. If $X \to B(n = 10, p = 0.5)$ then : $p(X \ge 9) = ...$ A. $\frac{10}{1024}$ B. $\frac{1}{1024}$ C. $\frac{11}{1024}$

D. none of these

Answer: C

25. A coin is tossed 5 times. What is the probability of getting at least 3 heads.

A.
$$\frac{11}{16}$$

B. $\frac{15}{16}$
C. $\frac{13}{16}$

D. none of these

Answer: D

26. Workers in an industry have a 10% chance of sufering from an occupational disease ,Probability that , out of 6 workers , at least 5 will catch the discease is

A.
$$\frac{11}{2,00,000}$$

B. $\frac{11}{2,000}$
C. $\frac{11}{200}$

D. none of these

Answer: A



27. Hens of a certain breed lay eggs 5 days 5 days a weak one an average .A poulatry keeper with 5 hens of this breed expects to get at least 4 eggs per day , then ,in a season of 100 days , his wish will be fulfilled on.....

[Given :
$$\left(rac{5}{7}
ight)^5 = 0.1859$$
]

A. 55 days

B. 56 days

C. 57 days

D. none of these

Answer: B



28. As an answer to a question , two options are given only one of which is correct , then the propbability of correctly answering at least 6 of the 10 questions is

A.
$$\frac{210}{512}$$

B. $\frac{120}{512}$
C. $\frac{193}{512}$

Answer: C



29. Jui's chance of winning a single game aginst Vrushali is $\frac{3}{4}$ probability that , in a series of 5 games ,jui wins at least 3 games is

A.
$$\frac{135}{512}$$

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



Answer: B



30. A fair coin is tossed 9 times. The probability that it shows heads in the first four tosses and tails in the last five tosses is

A.
$$\frac{1}{512}$$

B.
$$\frac{16}{512}$$

C. $\frac{64}{512}$

Answer: A

21



$$x \to B(n = 6, P = 0.3) \text{ and } (0.3)^6 = 0.000729$$

IE

then $: P(x \le 4) = \dots$

A. 0.9890

B. 0.9739

C. 0.9980

D. none of these

Answer: A

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 $X o B(n=20, p=0.03) \,\, ext{and} \,\, (0.97)^{20} = 0.5437$ then : $P(X \ge 1) =$

A. 0.5463

 $B.\,0.6453$

C. 0.4563

D. none of these

Answer: C

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33. A coin is tossed n times. The probability that

head will turn up an odd number of times , is

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

B. $\frac{1}{2}$
C. $\frac{2}{3}$

Answer: B



34. 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. 0.37

 $\mathsf{B.}\,0.32$

 $C.\,0.54$

D. none of these



35. If n toys are distributed among N boys randomly, then the probability that a particular boy gets r(< n) toys is

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

B. ${}^{n}C_{6}\left(\frac{1}{N}\right)^{r}$
C. ${}^{n}C_{r}$. $\left(\frac{1}{N}\right)^{r}$. $\left(\frac{N-1}{N}\right)^{n-r}$

D. none of these

Answer: C



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

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

B. $\frac{116}{128}$
C. $\frac{29}{128}$

D. none of these



37. A coin is rolled n times. If the probability of getting head at least once is greater than 90% then the minimum value of n is

A. 3

B. 4

C. 5

D. none of these

Answer: B

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38. If X is a binomial variate with parameters n

and p, where 0 > p > such that $rac{P(X=r)}{P(X=n-r)}$ is independent of n and r, then

p equals.

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

B. $\frac{1}{2}$
C. $\frac{1}{4}$

D. none of these

Answer: B

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39. Number of times a fair coin must be tossed so that the probabaility of getting at least one head is at least 0.95 is

A. 5

B. 6

C. 7

D. 12



40. 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

B. 10

C. 12

D. 24



41. If A and B toss 3 coins each, The probability that both get equal number of heads is

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

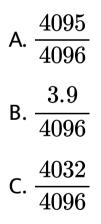
B. $\frac{1}{9}$
C. $\frac{5}{16}$

D. none of these

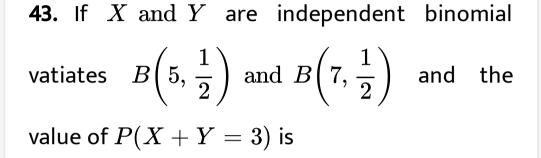
Answer: C



42. IF X and Y are independent binomial variables such that $X \to B(5, 0.5)$ and $Y \to B(7.0.5)$. then $p[(X + y) > 1] = \dots$



D. none of these



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A.
$$\frac{55}{1024}$$

B. $\frac{55}{4098}$
C. $\frac{55}{2048}$
D. $\frac{55}{128}$



44. If 10 coins are tossed simultaneoiusly , then probability of getting at least 7 heads is

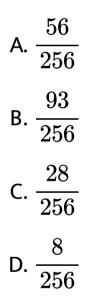
A.
$$\frac{120}{1024}$$

B. $\frac{45}{1024}$
C. $\frac{10}{1024}$
D. $\frac{176}{1024}$

Answer: D



45. If a fair coin is tossed 8 times , then the probability that it shows heads larger number of times than tails is



Answer: B



46. If the chance of a gushot hitting a target is 0.2 then the probability that at least 2 shots out of 10 will hit the target is

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

B. $1 - 7\left(\frac{4}{5}\right)^{10}$
C. $1 + \frac{7}{2}\left(\frac{4}{5}\right)^{10}$

D. none of these

Answer: D



47. Numberse are selected at random, one at a time, from the two-digit numbers 00,01,02,....99 with replacement. An event E occurs if and only if the product of the two digits of a selected number is 18. If four numbers are selected, find probability that the event E occurs at least 3 times.

A.
$$\frac{68}{(25)^4}$$

B. $\frac{72}{(25)^4}$
C. $\frac{97}{(25)^4}$

D. none of these

Answer: C

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48. A boy is throwing stones at a target. The probability of hitting the target at any trial is $\frac{1}{2}$ The probability of hitting the target 5th time at the 10th throw is

A.
$$\frac{5}{2^{10}}$$

B. $\frac{63}{2^9}$

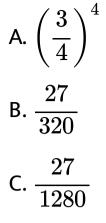


D. none of these

Answer: B



49. 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.

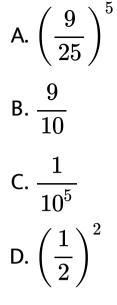


D. none of these

Answer: B



50. In a box containg 100 bulbs , 64 are defective probabaility that in a sample of 5 bulbs ,none is defective , is



Answer: A



51. Iterms produced by a compary are supposed

to contain 5% defective items .probability that a

sample of 8 items will contain less than 2

defective items is

A.
$$\frac{27}{20} \left(\frac{19}{20}\right)^7$$

B. $\frac{541}{400} \left(\frac{19}{20}\right)^6$
C. $\frac{153}{20} \left(\frac{1}{20}\right)^7$
D. $\frac{35}{16} \left(\frac{1}{20}\right)^6$



52. IF $X \to B(n,p)$ and Y = n - X then : $Y \to$

A. B(p, n)

- B. B(n, 1, -p)
- C. N(0, 1)
- D. none of these

Answer: B

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53. A binomial probability distribution is symmertrial .If the probability p of success in a single trial is

A. greater than 1/2

B. Less than 1/2

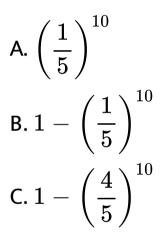
C. less than q = 1 - p

D. equal to 1/2

Answer: D



54. 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. $(4/5)^{10}$



D. none of these

Answer: C



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

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

B. $\frac{5}{32}$
C. $\frac{7}{16}$
D. $\frac{31}{32}$

Answer: D

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



57. 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



58. 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



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

the number of successes is

B. 25

C. 10

D. 100

Answer: B

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60. If turning up 1 or 3 is considered a success,

then the S.D of number of successes in 8 throws

is

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

B. $\frac{8}{3}$
C. $\frac{4}{3}$
D. $\frac{2}{3}$

Answer: C



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

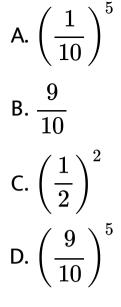
A.
$$\frac{8}{3}$$

B. $\frac{3}{8}$
C. $\frac{4}{5}$
D. $\frac{5}{4}$

Answer: D



62. 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



Answer: D

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63. 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



64. A biased coin with probability p, 0

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

B. $\frac{2}{3}$
C. $\frac{2}{5}$
D. $\frac{3}{5}$



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

Answer: D

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66. A coin is tossed 2n times. The change that the number of times one gets head is not equal to the number of times one gets tail is

A.
$${}^{2n}C_n.~\left(rac{1}{2}
ight)^{2n}$$

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

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

D. none of these

Answer: C

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

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

B. $\frac{3}{13}$
C. $\frac{2}{13}$

D. none of these

Answer: C

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68. 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



69. 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



70. 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



71. The mean and variance of a random variable X having a binomial distribution are 4 and 2 respectively. The P(X = 1) is

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

B. $\frac{1}{16}$
C. $\frac{1}{8}$
D. $\frac{1}{4}$

Answer: A



72. The mean and the 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. $\frac{28}{256}$



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



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

$$\begin{array}{c} \mathsf{C}. \ \displaystyle \frac{9}{\log_{10} 4 - \log_{10} 3} \\ \mathsf{D}. \ \displaystyle \frac{9}{\log_{10} - \log_{10} 3} \end{array}$$

Answer: A



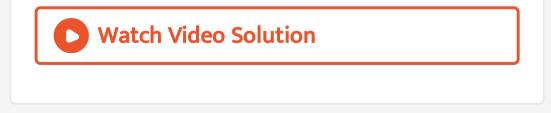
75. Numberse are selected at random, one at a time, from the two-digit numbers 00,01,02,....99 with replacement. An event E occurs if and only if the product of the two digits of a selected number is 18. If four numbers are selected, find

probability that the event E occurs at least 3

times.

A.
$$\frac{24}{(25)^4}$$

B. $\frac{25}{(25)^4}$
C. $\frac{49}{(25)^4}$
D. $\frac{97}{(25)^4}$



76. 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



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



78. 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



79. A die is thrown a fixed number of times. If probability of getting even number 3 times is same as the probability of getting even number 4 times, then probability of getting even number exactly once is 1/6 b. 1/9 c. 5/36 d. 7/128

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

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

C. $\frac{5}{36}$
D. $\frac{7}{128}$

Answer: D

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