Multiple Choice Questions

[This Topic was introduced in MHT-CET syllabus from 2011]
[MHT-CET 2022] (Online Shift)

1. If $X \sim B\left(8, \frac{1}{2}\right)$, then $P(|X-4| \leq 2) =$

   a) $\frac{117}{128}$ b) $\frac{119}{128}$ c) $\frac{116}{128}$ d) $\frac{29}{128}$

2. For a binomial distribution $n = 6$, if $9\,p\,(X = 4) = p\,(X = 2)$ then $q =$

   a) $\frac{1}{2}$ b) $\frac{2}{5}$ c) $\frac{1}{4}$ d) $\frac{3}{4}$

3. In a Binomial distribution, $n = 4$ and $2p\,(X = 3) = 3\,p\,(X = 2)$, then $q =$

   a) $\frac{11}{13}$ b) $\frac{9}{13}$ c) $\frac{4}{13}$ d) $\frac{2}{13}$

4. It is observed that 30 % of the students appearing for a certain entrace test are science students. If 5 students are randomly selected from this group, the probability of having 2 science students among these students is

   a) 0.3437 b) 0.2547 c) 0.3087 d) 0.1087

5. A die is thrown five times. If getting an odd number is a success, then the probability of getting at least 4 successes is

   a) $\frac{13}{16}$ b) $\frac{3}{16}$ c) $\frac{1}{32}$ d) $\frac{5}{32}$

6. Let a random variable X have a binomial distribution with mean 8 and variance 4. If $P(X \leq 2) = \frac{K}{2^{16}}$, then K is equal to

   a) 17 b) 137 c) 1 d) 121

7. One coin is thrown 100 times, then the probability of getting head in odd number is

   a) $\frac{1}{2}$ b) $\frac{1}{5}$ c) $\frac{1}{8}$ d) $\frac{3}{8}$

8. The probability of success for the Binomial Distribution satisfying the relation $4P(X = 4) = P(X = 2)$ and having parameter $n = 6$ is

   a) $\frac{5}{6}$ b) $\frac{1}{3}$ c) $\frac{1}{5}$ d) $\frac{1}{6}$

9. For a Binomial variate X, mean is 2 and variance is 1. The odds in favour of $X = 0$ are

   a) 1 : 15 b) 4 : 1 c) 15 : 1 d) 1 : 4

10. The incidence of occupational disease in an industry is such that the workmen have a 10% chance of suffering from it. The probability that out of 5 workmen, 3 or more will contract the disease is

    a) 0.000856 b) 0.0856 c) 0.0000856 d) 0.00856

21. If the sum of the mean and the variance of a binomial distribution for 5 trials is 1.8, then P =
a) 0.4 b) 0.2 c) 0.8 d) 0.18

22. The odds in favour of getting sum as multiple of 3, when pair of dice is thrown is
a) 1 : 2 b) 3 : 4 c) 4 : 5 d) 2 : 3

23. If $X \sim B\left(8, \frac{1}{2}\right)$, then $P(|X-4| \to \text{mod} \leq 2) =$
a) $\frac{119}{128}$ b) $\frac{29}{128}$ c) $\frac{238}{728}$ d) $\frac{119}{228}$

24. 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 at least one correct answer is
a) $\frac{32}{243}$ b) $\frac{80}{243}$ c) $\frac{211}{243}$ d) $\frac{163}{243}$

25. If a die is thrown 100 times, then the standard deviation of getting an even number is
a) 10 b) 5 c) 20 d) 15

26. If $X \sim B(4, p)$ and $2P(X=3) = 3P(X=2)$, then the value of P is
a) $\frac{12}{13}$ b) $\frac{9}{13}$ c) $\frac{4}{13}$ d) $\frac{1}{13}$

27. A fair coin is tossed 2 times. A person receives ₹ x^3 if he gets X number of heads. His expected gain is =
a) ₹ 5.20 b) ₹ 2.5 c) ₹ 2.00 d) ₹1.00

28. In a box containing 100 bulbs, 10 are defective. The probability that out of 20 bulbs selected at random, none is defective is
a) $5\left(\frac{1}{10}\right)^{20}$ b) $20\left(\frac{9}{10}\right)^{20}$ c) $10\left(\frac{1}{10}\right)^{20}$ d) $\left(\frac{9}{10}\right)^{20}$

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29. In a binomial distribution, mean is 18 and variance is 12, then p =
a) $\frac{1}{3}$ b) $\frac{2}{3}$ c) $\frac{3}{4}$ d) $\frac{1}{2}$

30. Let X be the number of successes in 'n' independent Bernouli trials with probability of success $P = \frac{3}{4}$. The least value 'n' so that $P(X \geq 1) \geq 0.9375$ is
a) 3 b) 2 c) 4 d) 1

31. If $X \sim B(16, P)$ and $E(X) = 12.8$, then the standard deviation of X is
a) 0.16 b) 1.6 c) 2.56 d) 0.256

32. If the sum of the mean and variance of a binomial distribution for 5 trials is 1.8, then P =
a) 0.3 b) 0.2 c) 0.8 d) 0.5

63. 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

a) $\frac{10}{3^5}$ b) $\frac{11}{3^5}$ c) $\frac{13}{3^5}$ d) $\frac{17}{3^5}$

64. For an entry to a certain course, a candidate is given twenty problems to solve. If the probability that the candidate can solve any problem is $\frac{3}{7}$, then the probability he is unable to solve atmost two problems is

a) $\frac{256}{49}\left(\frac{4}{7}\right)^{18}$ b) $\frac{1710}{49}\left(\frac{4}{7}\right)^{18}$ c) $\frac{1726}{49}\left(\frac{4}{7}\right)^{18}$ d) $\frac{1966}{49}\left(\frac{4}{7}\right)^{18}$

65. The probability that a person who undergoes a bypass surgery will recover is 0.6. The probability that of 6 patients who undergoe similar surgery, half of them will recover is

a) 0.1852 b) 0.2074 c) 0.2762 d) 0.7235

66. Ten bulbs are drawn successively, with replacement, from a lot containing 10% defective bulbs, then the probability that there is atlest one defective bulb, is

a) $1-(0.1)^{10}$ b) $1-(0.3)^{10}$ c) $1-(0.7)^{10}$ d) $1-(0.9)^{10}$

[MHT - CET 2025]

67. If $X \sim B(n, p)$, then $\frac{P(x=k)}{P(x=k-1)} =$

a) $\frac{n-k}{k-1}\cdot\frac{p}{q}$ b) $\frac{n-k+1}{k}\cdot\frac{p}{q}$ c) $\frac{n+1}{k}\cdot\frac{p}{q}$ d) $\frac{n-1}{k+1}\cdot\frac{p}{q}$

68. If $X \sim B\left(6, \frac{1}{2}\right)$, $P(|X-2| \leq 1) =$

a) $\frac{31}{32}$ b) $\frac{41}{64}$ c) $\frac{51}{64}$ d) $\frac{63}{64}$

69. If $X \sim B(35, p)$ such that $7\,P(X=0) = P(X=1)$, then $\frac{P(X=15)}{P(X=20)} =$

a) 7776 b) 3125 c) $\frac{3125}{7776}$ d) $\frac{625}{1296}$

70. If X is Binomial variable with range { 0, 1, 2, 3, 4 } and $P(X=3) = 3\,P(X=4)$, then the parameter p of the Binomial distribution is

a) $\frac{1}{4}$ b) $\frac{3}{4}$ c) $\frac{1}{3}$ d) $\frac{2}{5}$

71. If $X \sim B(33, p)$ such that $3\,P(X=0) = P(X=1)$, then the variance of X is

a) $\frac{11}{144}$ b) $\frac{35}{48}$ c) $\frac{121}{48}$ d) $\frac{33}{144}$

72. A fair coin is tossed for a fixed number of times. If probability of getting 5 tails is same as the probability of getting 7 tails, then the probability of getting 3 tails is

a) $\frac{44}{2^{13}}$ b) $\frac{55}{2^{10}}$ c) $\frac{55}{2^{13}}$ d) $\frac{44}{2^{10}}$

73. A fair n faced die is rolled repeatedly until a number less than n appears. If the mean of the number of tosses required is $\frac{n}{9}$, then $n\ (\in N) =$

a) 4 b) 6 c) 8 d) 10

74. A pair of fair dice is thrown 4 times. If getting the same number on both dice is considered as success, then the probability of two successes is

a) $\frac{25}{216}$ b) $\frac{25}{36}$ c) $\frac{25}{108}$ d) $\frac{25}{104}$

75. A boy tries to message his friend. Each time, the chance, the message is delivered is $\frac{1}{6}$ and the chance it fails is $\frac{5}{6}$. If he sends 6 messages, then the probability that exactly 5 messages are delivered is

a) $\frac{1}{6}$ b) $\frac{5}{6}$ c) $\binom{6}{5}\left(\frac{1}{6}\right)^5\left(\frac{5}{6}\right)$ d) $\frac{5}{36}$

76. The probability that a person not a sportsperson is $\frac{1}{6}$. Then the probability that out of 6 members of the family 5 are sportspersons is

a) $\left(\frac{5}{6}\right)^5$ b) $\left(\frac{5}{6}\right)^6$ c) $6\left(\frac{5}{6}\right)^5$ d) $5\left(\frac{5}{6}\right)^6$

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