(Random Variable and Binomial distribution)

Sr.No.	mcqs	Ans	
1	If E(X)=5, what value of E(2X+3)? (E means expectation here) (a) 25 (b) 13 (c) 7 (d) Can't be determined	B	
2	What will be the mean of a binomial distribution if its variance is 3 and p=1/4? a) 2 b) 3 c) 4 d) 6	c	
3	The mean and variance of a binomial variate X are 16 and 8. Find P(X>0). a) $1 - \dfrac{1}{2^{32}}$ b) 0 c) $\dfrac{1}{2^{32}}$ d) None of these	A	1mark
4	An experiment consists of tossing a coin and a die. Let represents E_1 the occurrence of Head and E_2 represents getting a multiple of 3. Then $P(E_1|E_2)$ represents probability of: a) Getting 3 or 6 when Head has shown up (b) Getting Head when 3 or 6 has shown (c) Getting Head and multiple of 3 or 6 together (d) Getting Head or multiple of 3 and 6 together.	B	
5	The probability mass function of a random variable X is 0 expect at the points x=0,1,2. At these points, it has values p(0)=0.1, p(1)=2c and p(2)=0.5-c. What is the value of c? a) 4 (b) 0.4 (c) 0 (d) 0.1	B	
6	Find mean if the probability density function is $f(x) = 2x, 0 < x < 1$. (a) 2 (b) 1/3 (c) 2/3 (d) 1	D	
7	If c=1, then its Expectation is (a) 0 (b) 100 (c) π (d) 1	D	
8	The expected value of a random variable is equal to its (a) mean (b) standard deviation (c) variance (d) co-variance	A	
9	Let X be a random variable then which of the following statement is correct? (a) Var(3X+2)=3 Var(X)+2 (b) Var(3X-2)=9 Var(X) (c) Var(3X+2)=9 Var(X)+2 (d) Var(3X-2)=3 Var(X)-4	B	

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10	The random variable X has the following distribution. Then $P(X = 10)$ is:	c	1 mark
	<table><tr><td>X</td><td>1</td><td>2</td><td>4</td><td>10</td></tr><tr><td>P(x)</td><td>0.3</td><td>0.2</td><td>0.2</td><td>?</td></tr></table>		
	(a) 0.2 (b) 0.5 (c) 0.3 (d) 0.1		
11	If X=5, then Var(X) is (a) 5 (b) 1 (c) 0 (d) ∞	C	
12	Given E(X) = 5 and E(Y) = -2, then E(X - Y) is: (a) 3 (b) 5 (c) 7 (d) -2	C	
13	If a random variable X satisfies Binomial distribution with mean 10 and p=0.2,then value of n is: (a) 50 (b) 60 (c) 70 (d) 100	A	
14	What is the variance of a Binomial variate $X \sim B\left(5, \frac{1}{5}\right)$? 1/5 (b) 4/5 (c) 5 (d) $\sqrt{\frac{4}{5}}$	B	
15	If E(X)=2 then what is the value of E(2x-3)? (a) 2 (b) 1 (c) -1 (d) 7	B	

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16	If expectation and standard deviation of a binomial variate is 9 and 3/2 respectively then number of trials are: (a) 12 (b) 18 (c) 15 (d) 10	A
17	The probability of a man hitting the target at a shooting range is 1/5. If he shoots 5 times, what is the probability that he hits the target at least once? (a) 1 (b) 0.3277 (c) 0 (d) 10	B
18	If you are given a 5 question MCQ test and every question has 4 responses out of which only one is correct. Any student who gets 3 or more correct answers, qualifies the test. What is the probability of qualifying without studying? (a) 10.35% (b) 5.35% (c) 25.3% (d) 35.5%	A
19	A study in an Engineering college shows that students who get A grade in Mathematics, their chances of getting placement is 0.7. If in section K19JC, 50 students have got A grade in Mathematics, what is the expected number of students getting placed? (a) 35 (b) 50 (c) 40 (d) 30	A
20	In a popular restaurant on an average 3 out of 5 customers seek water bottle with their meal. On a busy day, in a random sample of 10 customers who had meal in the restaurant. What is the probability that no one asked for the water bottle? (a) 1% (b) 0.1% (c) 0.01% (d) 0.3%	C
21	An entrepreneur has choice to go for one of the two business options. First option has 70% probability of success with 40% standard deviation; and second option offers 70% probability of success with 30% standard deviation. Which one you will recommend to him? (a) First option (b) Second option (c) Insufficient data (d) Both have equal risk	B

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22	In a lottery ticket there are two prizes for winners: first prize of Rs 1 Lakh out of 50000 tickets and second price of Rs 30,000 out of 10000 tickets. What should be the fair price of the lottery ticket? (a) Rs 10 (b) Rs 1000 (c) Rs 5 (d) Rs 1	C	1 mark
23	In a business venture one lady can make a profit of Rs 2 Lakhs with a probability of 0.6 or take a loss of Rs 50,000 with probability of 0.4? Determine the expectation. (a) Rs 1,40,000 (b) Rs 80,000 (c) Rs 1,00,000 (d) Rs 1,50,0000	C	
24	If it rains an umbrella-seller earns Rs 1000 on a day and if weather is fair then he loses Rs 150. What is his expectation of earning if chances of rain on a day are 30%? (a) Rs 500 (b) Rs 850 (c) Rs 1,000 (d) Rs 195	D	
25	What is the probability of getting a total of 10 exactly once in 3 throws of a pair of dice? (a) $\frac{121}{576}$ (b) $\frac{1}{12}$ (c) $\left(\frac{1}{12}\right)^3$ (d) $\left(\frac{1}{12}\right)\left(\frac{11}{12}\right)^2$	A	
26	Out of 1600 families with 5 children each, how many you would expect to have 2 boy? Assume equal probabilities for boys and girls. a) 500 (b) 200 (c) 600 (d) 800	A	
27	During war 2 ships out of 5 were sunk on an average in making a certain journey. What is the probability that exactly 2 out of convoy of 3 ships would arrive safely? a) 4/9 (b) 2/3 (c) 12/125 (d) 4/15	c	

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28	Assuming that the chance of a traffic accident in a day on a Delhi road is 0.01. If there are 100 such roads in Delhi, on how many days of an April month, you would expect no traffic accident? (Given $e = 2.718,\ e^{-1} = 0.368,\ e^{-10} =$ 0.0005. (a) 11 days (b) 7 days (c) 15 days (d) 3 days	A	1 mark
29	The probability of a man hitting the target is 50%. How many times he must fire so that the probability of hitting the target at least once is more than 80%? (a) 2 b) 3 c) 4 d) 6	b	
30	Lifetime of an electric bulb is a random variable with density $f(x) = kx^2$, where x is measured in years. If the minimum and maximum lifetimes of bulb are 1 and 2 years respectively, then the value of k is (a) 0.635 (b) 0.521 (c) 0.428 (d) 1	C	