MATHS

BOOKS - CBSE COMPLEMENTARY MATERIAL MATHS (HINGLISH)

PROBABILITY

One Mark Questions

1. Find P (A/B) if P(A) =0.4 , P(B) =0.8 and P (B/A) =0.6

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2. Find $P(A \cap B)$ if A and B are two events such that $P(A) = 0.5, P(B) = 0.6$ and $P(A \cup B) = 0.8$

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3. A soldier fires three bullets on enemy. The probability that the enemy will be killed by one

bullet is 0.7 What is the probability that the enemy is still alive ?

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4. If $P(A) = \frac{1}{2}, P(B) = \frac{7}{12}$ and P (not A or not B) $= \frac{1}{4}$, State whether A and B are independent .

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5. Three coins are tossed once. Find the probability of getting at least one head.

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6. Find P(A/B) , is P (B) =0.5 and $P(A \cap B)$ =0.32

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7. An urn contains 6 red and 3 black balls. Two balls are randomly drawn. Let x presents the number of black balls. What are the possible value of x?

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8. A die is tossed thrice. Find the probability of getting an even number at least once

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9. Events E and F are such that P (not E or not F) $= 0.25$. State whether E and F are mutually exclusive.

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10. Out of 30 consecutive integers 2 are choosen at random. Find the probability so that their sum is odd.

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11. If event A and B are mutually exclusive and exhaustive events and $P(A) = \frac{1}{3}P(B)$ then Find P (A)

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12. A natural number x is choosen at random from the first hundred natural numbers. Find the probability such that $x + \frac{1}{x} > 2$

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13. A bag contains 50 tickets numbered 1, 2, 3, .., 50 of which five are drawn at random and arranged in ascending order of magnitude `(x_1

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Two Mark Quesitons

1. A and B are two events such that $P(A) \neq 0$. Find $P(B \mid A)$, if (i) A is a subset

of B (ii) $A \cap B = \varphi$

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2. A random variable X has the following probability distribution find K.

X	0	1	2	3	4	5
P(X)	$\frac{1}{15}$	K	$\frac{15K-2}{15}$	K	$\frac{15K-1}{15}$	$\frac{1}{15}$

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3. If $P(A)=\frac{1}{2}, P(A \cup B)=\frac{3}{5}$ and P (B) =q find the value of q is A and B are (i) Mutually exclusive (ii) independent events.

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4. If $(A)=\frac{3}{10}, P(B)=\frac{2}{5}$ and $P(A \cup B)=\frac{3}{5}$ then P(B/A)+P(A/B) equals to

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5. A die is rolled if the out come is an even number. What is the probability that it is a prime?

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6. If A and B are two events such that $P(A) = \frac{1}{4}$, $P(B) = \frac{1}{2}$ and $P(A \cap B) = \frac{1}{8}$, find P (not A and not B).

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7. The probability that atleast one of the two events A and B occurs is 0.6. If A and B occur simultaneously with probability 0.3, then evaluate $P(\overline{A}) + P(\overline{B})$.

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8. Three events A, B and C have probalities $\frac{2}{5}, \frac{1}{3}$ and $\frac{1}{2}$, respectively. If, $P(A \cap C) = \frac{1}{5}$ and $P(B \cap C) = \frac{1}{4}$, then find the values of P(C/B) and $P(A' \cap C')$

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9. A die, whose faces are marked 1, 2, 3 in red and 4, 5, 6 in green, is tossed. Jet A be the event “number obtained is even” and. B be B the event “number obtained is red”. Find ifA and B are independent events.

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10. An urn contains 10 black and 5 white balls. Two balls are drawn from the nm one after the

other without replacement. What is the probability that both drawn balls are black?

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11. Prove that if E and F are independent events, then so are the events E and F.

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12. The probability distribution of discrete random variable X is given below

x	2	3	4	5
$P(x)$	$\frac{5}{K}$	$\frac{7}{k}$	$\frac{9}{k}$	$\frac{11}{k}$

find the value of K.

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13. If $P(A) = \frac{7}{3}, P(B) = \frac{9}{13}, \text{and} P(A \cap B) = \frac{4}{13}$, then find $P\left(\frac{A}{B}\right)$

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14. In Class XI of a school 40% of the students study Mathematics and 30% study Biology. 10% of the class study both Mathematics and Biology. If a student is selected at random from the class, find the probability that he will be studying Mathematics

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15. If P(A)=0.4 P(B) = 0.8 and $P\left(\frac{B}{A}\right) = 0.6$ then find $P(A \cup B)$.

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16. A die has two faces each with number 1, three faces each with number 2 and one face with number 3. If die rolled once determine: i. P(2) ii. P(1 or 3) iii. P(not 3)

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17. A coin is tossed 4 times. Find the mean and variance of the probability distribution of the number of tails.

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18. There are 25 ticketsbearing numbers form 1 to 25 one ticket is drown at random. Find the probability that the number on it is a multiple of 5 or 6.

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Four Mark Questions

1. A problem in mathematics is given to 3 students whose chances of solving it are $\frac{1}{2}; \frac{1}{3}; \frac{1}{4}$. What is the probability that the problem is solved?

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2. 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 (1) 0.06 (2) 0.14 (3) 0.2 (3) 0.7

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3. Two dice are tossed once. Find the probability of getting an even number on the first die or a total of 8.

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4. A and B throw a die alternatively till one of them gets a 6 and wins the game. Find their respective probabilities of winning, if A starts first.

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5. 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

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6. Two cards are drawn from a pack of well shuffled 52 cards one by one withreplacement. Getting an ace or a spade is considered a success. Findthe probability distribution for the number of successes.22.

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7. In a game, a man wins a rupee for a six and loses a rupee for any other number when a fair die is thrown. The man decided to throw a die thrice but to quit as and when he gets a six. Find the expected value of the amount he wins / loses.

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8. Suppose that 10% of men and 5% of women have grey hair. A grey haired person is selected at random. What is the probability that the

selected person is male assuming that there are 60% males and 40% females

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9. A card from a pack of 52 cards is lost. From the remaining cards of the pack, two cards are drawn and are found to be both diamonds. Find the probability of the lost card being a diamond.

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Six Mark Questions

1. If A and B are two independent events such that $P(A \cap \overline{B}) = \frac{1}{6}$ and $P(\overline{A} \cap B) = \frac{2}{15}$ then find $P(A)$ and $P(B)$

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2. Bag A contains 4 red, 3 white and 2 black balls. Bag B contains 3 red, 2 white and 3 black balls. One ball is transferred from bag A to bag B and then a ball is drawn from bag B.

The ball so drawn is found to be red.Find the probability that the transferred ball is black.

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3. A doctor is to visit a patient. From the past experience, it is known that the probabilities that he will come by train, bus, scooter or by other means of transport are respectively $\frac{3}{10}, \frac{1}{5}, \frac{1}{10} and \frac{2}{5}$. The probabilities that he will be l

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4. As man is known to speak truth 3 out of 4 times. He throws a die and reports that it is a six. Find the probability that it is actually a six.

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5. An insurance company insured 2000 scooter drivers, 4000 car drivers and 6000 truck drivers. The probability of an accident involving a scooter, a car and a truck are 0.01, 0.03 and 0.15 respectively. One of the insured

persons meets with an accident. What is the probability that he is a scooter driver.

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6. Three cards from a pack of 52 cards are lost. One card is drawn from the remaining cards. If drawn card is heart, find the probability that the lost cards were all hearts

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7. A bag A contains 2 white and 3 red balls and a bag B contains 4 white and 5red balls. One ball is drawn at random from one of the bags and is found to be red. Find the probability that it was drawn as red.

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8. In answering a question on a multiple choice test, a student either knows the answer or guesses. Let $\frac{3}{4}$ be the probability that he

knows the answer and $\frac{1}{4}$ be the probability that he guesses. Assuming that a student who guesses at the ans

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9. Suppose a girl throws a die. If she gets a 5 or 6, she tosses a coin three times and notes the number of heads. If she gets 1, 2, 3 or 4, she tosses a coin once and notes whether a head or tail is obtained. If she obtained exactly one head, what

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10. In a bolt factory machines, A, B and C manufacture bolts in the ratio 6:3:1. 2%, 5% and 10% of the bolts produced by them respectively are defective. A bolt is picked up at random from the product and is found to be defective. What is the probability that it has been manufactured by machine A?

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11. Two urns A and B contain 6 black and 4 white, 4 black and 6 white balls respectively. Two balls are drawn from one of the urns. If both the balls drawn are white, find the probability that the balls are drawn from urn B.

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12. Two cards are drawn from a well shuffled pack of 52 cards. Find the mean and variance

for the number of face cards obtained.

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13. A letter is known to come either from TATANAGAR or CALCUTTA. On the envelope, Just to consecutive letters TA are visible. What is the probability that the letter came from (i) TATANAGAR (ii) CALCUTTA

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14. Two groups are competing for the position on the Board of directors of a corporation. The probabilities that the first and the second groups will win are 0.6 and 0.4 respectively. Further, if the first group wins, the probability of introducing a

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15. Two numbers are selected are random (without replacement) from positive integers

2,3,4,5,6 and 7. Let X denote the larger of the two numbers obtained. Find the mean and variance of the probability distribution of X.

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16. A bag contains 5 balls. Two balls are drawn and are found to be white. What is the probability that all the balls are white?

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17. Find the probability distribution of the number of doublets in four throws of a pair of dice.

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18. Three critics review a book. Odds in favour of the book are 5:2, 4:3 and 3:4 respectively for three critics. Find the probability that eh majority are in favour of the book.

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19. A box contains 2 Black, 4 White and 3 Red balls. One by one all balls are drawn without replacement and arranged in sequence of drawing. Find the probability that the drawn balls are in sequence of $BBWWWRRR$.

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20. A bag contains 3 White, 3Black and 2 Red balls. 3 balls are successively drawn without

replacement. Find the probability that third ball is red.

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