CLASS XI – MATHEMATICS – CHAPTER 16
PROBABILITY

Name: Date:

Q01. Three coins are tossed simultaneously list the sample space for the event.

Q02. Two dice are thrown simultaneously. Find the prob. of getting doublet.

Q03. 100 cards are numbered from 1 to 100. One card is then drawn at random. What is the probability of a prime number.

Q04. If 3/10 is the prob. that an event will happen, what is the probability that it will not happen?

Q05. If A and B are two mutually exclusive events such that P(A) = $\frac{1}{2}$ and P(B)=$\frac{1}{3}$. Find P(AUB)

Q06. A coin is tossed three times consider the following event

A : No head appears, B : Exactly one head appears and

C : At least two heads appears do they form a set of mutually exclusive and exhaustive events.

Q07. A and B are events such that P(A) = 0.42, P(B) = 0.48, and P(A and B) = 0.16. Determine

(a). P(not A) (b). P(not B) (c). P(A or B)

Q08. Find the prob. that when a hand of 7 cards is drawn from a well shuffled deck of 52 cards, it contains

(a). all king (b). 3 kings (c). at least 3 kings

Q09. Three letters are dictated to three persons and an envelope is addressed to each of them, those letters are inserted into the envelopes at random so that each envelope contains exactly one letter. Find the probability that at least one letter is in its proper envelope.

Q10. If 4 digit no. greater than 5,000 are randomly formed the digits 0,1,3,5 and 7.what is the prob. of forming a no. divisible by 5 when

(a). The digits are repeated (b). The repetition of digits is not allowed

Q11. If E and F are events such that P(E) = 1/4, P(F) = 1/2 and P(E and F) = 1/8 .
Find P(not E and not F)

Q12. A letter is chosen at random from the word 'ASSASSINATION'. Find the prob. that letter is a consonant.

Q13. There are four men and six women on the city council. If one council member is selected for a committee at random, how likely is it that at it is a woman?

Q14. 4 cards are drawn from a well snuffled deck of 52 cards what is the prob. of obtaining 3 diamonds and one spade.

Q15. Describe the sample space. A coin is tossed and a die is thrown.

Q16. From a group of 2 boys and 3 girls, two children are selected at random. Describes the sample space associated with

(a). E_1 : both the selected children are boys (b). E_2 : at least one selected child is a boy

(c). E_3 : one boy and one girl is selected (d). E_4 : both the selected children are girls

Q17. A book contains 100 pages. A page is chosen at random. What is the chance that the sum of the digit on the page is equal to 9 .

Q18. A pack of 50 tickets numbered 1 to 50 is shuffled and the two tickets are drawn find the prob.

(a). Both the ticket drawn bear prime no. (b). Neither of the tickets drawn bear prime no.

Q19. 20 cards are numbered from 1 to 20. One card is drawn at random what is the prob. that the no. on the card drawn is

(a). A prime number (b). An odd number(c). A multiple of 5 (d). Not divisible by 3.

Q20. In a single throw of three dice, find the prob. of getting

(a). A total of 5 (b). A total of at most 5.

Q21. We wish to choose one child of 2 boys and 3 girls. A coin is tossed. If it comes up heads, a boy is chosen, otherwise a girl is chosen. Describe the sample space.

Q22. What is the chance that a leap year, selected at random, will contain 53 Sundays?

Q23. If P(A) = 0.6, P(B) =0.4 and $P(A \cap B) = 0$, then the events are

Q24. In general the prob. of an event lie between?

Q25. A and B are two mutually exclusive events of an experiment. If P(not A) = 0.65, $P(A \cup B) = 0.65$ and P(B) = K, find K .

Q26. In a 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 or biology.

Q27. A hockey match is played from 3 pm to 5 pm. A man arrives late for the match what is the prob. that he misses the only goal of the match which is scored at the 20^{th} minute of the match?

Q28. In a single throw of two dice, find the prob. that neither a doublet nor a total of 10 will appear.

Q29. The prob. that a person will get an electrification contract is 2/5 and the probability that he will not get a plumbing contract is 4/7. If the prob. of getting at least one contract is 2/3, what is the prob. that he will get both?

Q30. In a town of 6000 people 1200, are over 50 yr. old and 2000 are females. It is known that 30% of the females are over 50 yr what is the probability that a randomly chosen individual from the town is either female or over 50 yr.

Q31. A box contains 1 white and 3 identical black balls. Two balls are drawn at random in succession without replacement. Write the sample space for this experiment.

Q32. Three coins are tossed once. Find the probability at most two heads.

Q33. One card is drawn from a pack of 52 cards, find the probability that drawn card is either red or king.

Q34. Five cards are drawn from a well shuffled pack of 52 cards. Find the probability that all the five cards are hearts.

Q35. From a deck of 52 cards four cards are accidently dropped. Find the chance that the missing cards should be one from each other.

Q36. In a class of 60 students 30 opted for NCC, 32 opted for NSS, 24 opted for both NCC and NSS. If one of these students is selected at random find the probability that

(a). The student opted for NCC or NSS

(b). The student has opted neither NCC nor NSS.

(c). The student has opted NSS but not NCC.

Q37. Two students Anil and Ashima appeared in an examination. The probability That Anil will qualify the examination is 0.05 and that Ashima will qualify the examination is 0.10. The probability that both will

qualify the examination is 0.02 find the probability that

(a). Both Anil and Ashima will qualify the examination

(b). Only one of them will qualify the examination and

(c). At least one of them will not qualify the examination

Q38. Out of 100 students, two sections of 40 and 60 are formed. If you and your friend are among the 100 students what is the probability that

(a). You both enter the same section? (b). You both enter the different section?

Q39. There are three mutually exclusive and exhaustive events E_1, E_2 and E_3. The odds are 8 : 3 against E_1 and 2 : 5 in favours of E_2 fined the odd against E_3.

Q40. If an entrance test that is graded on the basis of two examinations, the probability of a randomly chosen student passing the first examination is 0.8 and the probability of passing the second examination is 0.7. The probability of passing at least one of them is 0.95. What is the probability of passing both?

Q41. In a random sampling three items are selected from a lot. Each item is tested and classified as defective (d). or non – defective (H). Write the sample space.

Q42. Find the probability that in a random arrangement of the letters of the word UNIVERSITY the two I's come together.

Q43. The odds in favour of an event are 3 : 5, find the probability of occurrence of this event.

Q44. What is the probability that an ordinary year has 53 Sundays?

Q45. If odds against an event be 7 : 9, find the probability of non-occurrence of this event.

Q46. One card is drawn from a well shuffled deck of 52 cards. If each outcome is equally likely calculate the probability that the card will be.

(a). a diamond (b). Not an ace (c). A black card (d). Not a diamond.

Q47. In a lottery, a person chooses six different natural no. at random from 1 to 20 and if these six no. match with six number already fixed by the lottery committee, he wins the prize. What is the probability of winning the prize in the game?

Q48. A die has two faces each with number 1 three faces each with number 2 and one face with no. 3 if the die is rolled once, determine

(a). P(2) (b). P(1 or 3) (c). P(not 3)

Q49. A bag contains 50 tickets no. 1,2,3,……, 50 of which five are drawn at random and arranges in ascending order of magnitude($x_1 < x_2 < x_3 < x_4 < x_5$) find the probability that $x_3 = 30$

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EXTRA QUESTIONS

Q01. An ordinary deck of cards contains 52 cards divided into four suits. The red suits are diamonds and hearts and black suits are clubs and spades. The cards J, Q, and K are called face cards. Suppose we pick one card from the deck at random.
(a). What is the sample space of the experiment?
(b). What is the event that the chosen card is a black face card?

Q02. Suppose that each child born is equally likely to be a boy or a girl. Consider a family with exactly three children.
(a). List the eight elements in the sample space whose outcomes are all possible genders of the three children.
(b). Write each of the following events as a set and find its probability :
(i) The event that exactly one child is a girl.
(ii) The event that at least two children are girls
(iii) The event that no child is a girl.

Q03. (a). How many two-digit positive integers are multiples of 3?
(b). What is the probability that a randomly chosen two-digit positive integer is a multiple of 3?

Q04. A typical PIN (personal identification number) is a sequence of any four symbols chosen from the 26 letters in the alphabet and the ten digits. If all PINs are equally likely, what is the probability that a randomly chosen PIN contains a repeated symbol?

Q05. An experiment has four possible outcomes A, B, C and D, that are mutually exclusive. Explain why the following assignments of probabilities are not permissible:
(a). P(A) = .12, P(B) = .63, P(C) = 0.45, P(D) = – 0.20
(b). P(A) = 9/120 , P(B) = 45/120 P(C) = 27/120 P(D) = 46/120

Q06. Probability that a truck stopped at a roadblock will have faulty brakes or badly worn tires are 0.23 and 0.24, respectively. Also, the probability is 0.38 that a truck stopped at the roadblock will have faulty brakes and/or badly working tires. What is the probability that a truck stopped at this roadblock will have faulty breaks as well as badly worn tires?

Q07. If a person visits his dentist, suppose the probability that he will have his teeth cleaned is 0.48, the probability that he will have a cavity filled is 0.25, the probability that he will have a tooth extracted is 0.20, the probability that he will have a teeth cleaned and a cavity filled is 0.09, the probability that he will have his teeth cleaned and a tooth extracted is 0.12, the probability that he will have a cavity filled and a tooth extracted is 0.07, and the probability that he will have his teeth cleaned, a cavity filled, and a tooth extracted is 0.03. What is the probability that a person visiting his dentist will have atleast one of these things done to him?

Q08. An urn contains twenty white slips of paper numbered from 1 through 20, ten red slips of paper numbered from 1 through 10, forty yellow slips of paper numbered from 1 through 40, and ten blue slips of paper numbered from 1 through 10. If these 80 slips of paper are thoroughly shuffled so that each slip has the same probability of being drawn. Find the probabilities of drawing a slip of paper that is

(a). blue or white

(b). numbered 1, 2, 3, 4 or 5

(c). red or yellow and numbered 1, 2, 3 or 4

(d). numbered 5, 15, 25, or 35;

(e) white and numbered higher than 12 or yellow and numbered higher than 26.