MATHS

BOOKS - RD SHARMA MATHS (ENGLISH)

COMBINATIONS

Others

1. A number of 18 guests have to be seated, half on each side of a long table. Four particular guests desire to sit on one particular side and three others

on the other side. Determine the number of ways in which the sitting arrangements can be made.

2. A boy has 3 library tickets and 8 books of his interest in the library. Of these 8, he does not want to borrow Chemistry part II, unless Chemistry Part I is also borrowed. In how many ways can be choose the three books to be borrowed?

3. Find the number of arrangement from the word 'MATHS'.

4. Given 11 points, of which 5 lie on one circle, other than these 5, no 4 lie on one circle. Then the maximum number of circles that can be drawn so that each contains atleast three of the given points is

5. The value of

$$\left({}^7C_0 + {}^7C_1\right) + \left({}^7C_1 + {}^7C_2\right) + \dots + \left({}^7C_6 + {}^7C_7\right)$$

is (A) $2^7 - 1$ (B) $2^8 - 2$ (C) $2^8 - 1$ (D) 2^8

6. Let $n \, and \, r$ be no negative integers suych that

$r \leq n$ .Then, ${}^nC_r + {}^nC_{r-1} = {}^{n+1}C_r$

7. Let $n \, and \, r$ be non negative integers such that

$1 \leq r \leq n$. Then, ${}^nC_r = \dfrac{n}{r} \cdot {}^{n-1}C_{r-1}$.

8. If $1 \leq r \leq n$, then

$$n^{n-1}C_{r\ -1} = (n - r + 1)\ {}^nC_{r-1}.$$

9. If ${}^nC_x = {}^nC_y$ and $x \neq y$, then $x + y = n$.

10. If ${}^{10}C_x = {}^{10}C_{x+4}$, find the value of x.

11. Evaluate the following: $^{10}C_8$

12. Evaluate the following: $^{100}C_{98}$

13. Evaluate the following: $^{52}C_{52}$

14. If the ratio $^{2n}C_3 : {}^nC_3$ is equal to 11:1 find n.

15. Prove that: $^{2n}C_n = \dfrac{2^n[1.\ 3.\ 5(2n-1)]}{n!}$

16. If $^{n+2}C_8 : {}^{n-2}P_4 = 57:16,\ Solve\ f\ or\ \ n$

17. Evaluate the following: $^{14}C_3$

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18. Evaluate the following: $^{12}C_{10}$

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19. Evaluate the following: $^{35}C_{35}$

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20. Evaluate the following: $^{n+1}C_n$

21. Evaluate the following: $\displaystyle\sum_{r=1}^{5} {}^{5}C_r$

22. If $^{n}C_{12} = {}^{n}C_5,$ find the value of n

23. If $^nC_{10} = {^nC_{12}}\, find\, ^{23}C_n$

24. If $^{18}C_x = {^{18}C_{x+2}},\ Solve\ f\ or\ x$

25. If $^8C_r - {^7C_3} = {^7C_2}$ find r

26. If $.^{n+2}C_8 :^{n-2}P_4 : : 57 : 16,$ find n

27. If $^{16}C_r = {}^{16}C_{r+2},$ find $^rC_4$

28. If C(n,4) = C(n,6). Find C(12,n)

29. If $^{24}C_x = {}^{24}C_{2x+3}$ find x

30. If $^{15}C_{3r} = {}^{15}C_{r+3},$ find $r.$

31. If 15Cr :15C(r-1)=11 :5 find r.

32. If $^{28}C_{2r} : {}^{24}C_{2r-4} = 225 : 11$, find r

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33. if C(2n,3):C(n,2)=44:3 find n

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34. If $\alpha = {}^{4}C_2,$ then find the value of $^{\alpha}C_2.$

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35. For all positive integers n, show that

$$^{2n}C_n + {}^{2n}C_{n-1} = \frac{1}{2}\left({}^{2n+2}C_{n+1}\right).$$

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36. From a class of 32 students, 4 are to be chosen for a competition. In how many ways can this be done?

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37. Three gentlemen and three ladies are candidates for two vacancies. A voter has to vote for two candidates. In how many ways can one cast his vote?

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38. If there are 12 persons in a party, and if each two of them shake hands with each other, how many handshakes happen in the party?

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39. A question paper has two parts, Part A and party B each containing 10 questions. If a student has to chose 8 from Part A and 5 from Part B, in how many ways can he choose the questions?

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40. In how many ways a committee of 5 member can be selected from 6 men and 5 women, consisting of 3 men 2 women?

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41. A committee of 3 persons is to be constituted from a group of 2 men and 3 women. In how many ways can this be done? How many of these committees would consist of 1 man and 2 women?

42. What is the number of ways of choosing 4 cards from a pack of 52 playing cards? In how many of these Four cards are of the same suit? For cards are face cards? Cards are of the same colour? Four cards belong to four different suits? Two aqre red cards and two are black cards?

43. Out of 5 men and 2 women, a committee of 3 is to be formed. In how many ways can it be formed if at least one woman is to be included?

44. For the post of 5 teachers, there are 23 applicants, 2 posts are reserved for SC candidates and there are 7 SC candidates among the applicants. In how many ways can he selection be made?

45. How many triangles can be formed by joining the vertices of a hexagon?

46. A polygon has 44 diagonals. The number of its sides are

47. From a class of 25 students, 10 are to be chosen for an excursion party. There are 3 students who decide that either all of them will join or none of them will join. In how many ways can the excursion party be chosen?

48. In how many ways can 7 plus (+) and 5 minus (-) signs be arranged in a row so that no two minus (-) signs are together?

49. In how many ways can 21 books on English and 19 books on Hindi be placed in a row on a shelf so that two books on Hindi may not be together? (A) 770 (B) 385 (C) 1540 (D) 399

A. 770

B. null

C. null

D. null

Answer: null

50. From a group of 15 cricket players, a team of 11players is to be chosen. In how many ways can this be done?

51. How many different boat parties of 8, consisting of 5 boys and 3 girls, can be made from 25 boys and 10 girls.

52. In how many ways can a student choose a programme of 5 courses if 9 courses are available and 2 specific courses are compulsory for every student?

53. In how many ways can a football team of 11 players be selected from 16 players? How many of these will i. include 2 particular players? Ii. exclude 2 particular players?

54. There are 10 professors and 20 students out of whom a committee of 2 professors and 3 students is to be formed. A)Find the number of ways in which this can be done. B) Further find in how many of these committees: A particular professor is included A particular student is included Particular student is excluded

55. How many different products can be obtained by multiplying two or more of the numbers 3, 5,7, 11 (without repetition)?

56. From a class of 12 boys and 10 girls, 10 students are to be chosen for a competition; at leastincluding 4 boys and 4 girls. The 2 girls who won the prizes last year should be included. In how many ways can the selection be made?

57. How many different selections of 4 books can be made from 10 different books, if There is no

restriction; Two particular books are always selected; Two particular books are never selected?

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58. From 4 officers and 8 jawans in how many ways can 6 be chose To include exactly one officer To include at least one officer?

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59. A sports team of 11 students is to be constituted, choosing at least 5 from class XI and at

least 5 from class XII. if there are 20 students in each of these classes, in how many ways can the team be constituted. What is the importance of sports in one's life ?

60. A student has to answer 10 questions, choosing at least 4 from each of part A and B. If there are 6 questions in part A and 7 in part B. In how many ways can the student choose 10 questions?

61. In an examination a student has to answer 4 questions out of 5 questions; questions 1 and 2 are however compulsory. Determine the number f ways n which the student can make the choice.

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62. A group consists of 4 girls and 7 boys. In how many ways can a team of 5 members be selected if the team has (i) no girl ? (ii) at least one boy and one girl ? (iii) at least 3 girls ?

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63. A committee of 3 persons is to be constituted from a group of 2 men and 3 women. In how many ways can this be done? How many of these committees would consist of 1 man and 2 women?

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64. Find the number of diagonals and triangles formed in a decagon.

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65. Determine the number of 5-card combinations out of a deck of 52 cards if each selection of 5 cards has exactly one king.

66. In how many ways can a team of 3 boys and 3 girls be selected from 5 boys and 4 girls?

67. Find the number of ways of selecting 9 balls from 6 red balls, 5 white balls and 5 blue balls if each selection consists of 3 balls of each colour.

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68. Determine the number of 5 card combinations out of a deck of 52 cards if there is exactly one ace in each combination.

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69. In how many ways can one select a cricket team of eleven from 17 players in which only 5 players can bowl if each cricket team of 11 must include exactly 4 bowlers?

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70. A bag contains 5 black and 6 red balls. Determine the number of ways in which 2 black and 3 red balls can be selected.

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71. In how many ways can a student choose a programme of 5 courses if 9 courses are available and 2 specific courses are compulsory for every student?

72. A committee of 7 has to be formed from 9 boys and 4 girls. In how many ways can this be done when the committee consists of: (i) exactly 3 girls (ii) atleast 3 girls (iii) atmost 3 girls

73. In an examination, a question paper consists of 12 questions divided into two parts i.e., Part I and Part II, containing 5 and 7 questions, respectively. A student is required to attempt 8 questions in all, selecting at least 3 from each part. In how many ways can a student select the questions?

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74. Out of 7 consonants and 4 vowels. how many words of 3 consonant and 2 vowels can be formed?

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75. how may four letter words can be formed uysing het letters of the word FAILURE so that F is included in each word? F is not include in any word?

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76. How many words, with or without meaning, can be formed using all the letters of the word EQUATION at a time so that the vowels and consonants occur together?

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77. How many five letter words containing 3 vowels and 2 consonants can be formed using the letters of the word EQUATION so that the two consonants occur together?

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78. How many words, with or without meaning, each of 2 vowels and 3 consonants can be formed from the letters of the word DAUGHTER ?

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79. The English alphabet has 5 vowels and 21 consonants. How many words with two different vowels and 2 different consonants can be formed from the alphabet?

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80. In how many ways can 5 girls and 3 boys be seated in a row so that no two boys are together?

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81. How many different words, each containing 2 vowels and 3 consonants can be formed with 5 vowels and 17 consonants?

82. There are 10 persons named $P_1, P_2, P_3..., P_{10}$. Out of 10 persons, 5 persons are to be arranged in a line such that is each arrangement P_1 must occur whereas P_4 and P_5 do not occur. Find the number of such possible arrangements.

83. Find the number of permutations of n distinct things taken r together, in which 3 particular things must occur together.

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84. How many words, with or without meaning, each of 3 vowels and 2 consonants can be formed from the letters of the word INVOLUTE?

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85. The number of permutations of n things taken r at a time if 3 particular things always occur is

86. How many words, with or without meaning can be made from the letters of the word MONDAY, assuming that no letter is repeated, if. (i) 4 letters are used at a time, (ii) all letters are used at a time, (iii) all letters are used but first letter is a vowel?

87. If $C(35, n + 7) = C(35, 4n - 2)$ then all the values of n are

88. Write the number of diagonals of an n-sided polygon.

89.   Write   the   expression

$^nC_{r+1} + {}^nC_{r-1} + 2 \times {}^nC_r$ in the simplest form.

90. There are 3 letters and 3 directed envelopes. Write the number of ways in which no letter is put in the correct envelope.

91. Write the maximum number of points of intersection of 8 straight lines in a plane.

92. The number of parallelograms that can be formed from a set of four parallel lines intersecting another set of three parallel lines is:

93. The number of ways in which 12 students can be equally divided into three groups is

94. Write the total number of words formed by 2 vowels and 3 consonants taken from 4 vowels and 5 consonants.

95. If $^{20}C_r = {}^{20}C_{r-10}$, $then$ $^{18}C_r$ is equal to 'a. 4896 b. 816 c. 1632 d. none of these'

96. If $^{20}C_r = {}^{20}C_{r+4}$, $then$ $^rC_3$ is equal to a. 54 b. 56 c. 58 d. none of these

97. If $^{15}C_{3r} = {}^{15}C_{r+3}$ $then$ r is equal to a. 5 b. 4 c. 3 d. 2

98. If $^{20}C_{r+1} = {}^{20}C_{r-1}$, $then$ r is equal to a. 10 b. 11 c. 19 d. 12

99. If $C(n, 12) = C(n, 8), \; then \; C(22, n)$ is equal to a. 132 b. 210 c. 252 d. 303

100. If $^{m}C_1 = \, ^{n}C_2$ then which is correct a. $2m = n$ b. $2m = n(n+1)$ c. $2m = (n-1)$ d. $2n = m(m-1)$

101. If $^nC_{12} = {}^nC_8$ then $=$ a. 20 b. 12 c. 6 d. 30

102. If $^nC_r + {}^nC_{r+1} = {}^{n+1}C_x$, $then x =$ a. r b. $r - 1$ c. n d. $r + 1$

103. If $^{a^2-a}C_2 = {}^{a^2-a}C_4$ then value of a is $=$ a. 2 b. 3 c. 4 d. none of these

104. $^5C_1 + {}^5C_2 + {}^5C_3 + {}^5C_4 + {}^5C_5$ is equal to a

30 b. 31 c. 32 d. 33

105. Total number of words formed by 2 vowels and 3 consonants taken from 4 vowels and 5 consonants is equal to a 60 b. 120 c. 7200 d. none of these

106. There are 12 points in a plane. The number of the straight lines joining any two of them when 3 of them are collinear is a. 62 b. 63 c. 64 d. 65

107. There persons enter a railway compartment. If there are 5 seats vacant in how many ways can they take these seats? 60 b. 20 c. 15 d. 125

108. In how many ways can a committee of 5 be made out of 6 men and 4 women containing at least one women? a. 246 b. 222 c. 186 d. none of these

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109. There are 10 points in a plane and 4 of them are collinear. The number of straight lines joining any two of them is a. 4 b. 40 c. 38 d. 39

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110. There are 13 players of cricket, out of which 4 are bowlers. In how many ways a team of eleven be selected from them so as to include at least two bowlers? a. 72 b. 78 c. 4 d. none of these

111. The number of ways in which a host lady can invite for a party of 8 out of 12 people of whom two do not want attend the party together is a. $2 \times {}^{11}C_7 + {}^{10}C_8$ b. ${}^{10}C_8 + {}^{11}C_7$ c. ${}^{12}C_8 - {}^{10}C_6$ d. none of these

112. How many different committees of 5 can be formed from 6 men and 4 women on which exact 3 men and 2 women serve? 6 b. 20 c. 60 d. 120

113. The number of diagonals that can be drawn by joining the vertices of an octagon is a. 20 b. 28 c. 8 d. 16

114. If $^{43}C_{r-6} = {}^{43}C_{3r+1}$ then the value of r is a.

12 b. 8 c. 6 d. 10 e. 14

115. A lady gives a dinner party for six guests. The number of ways in which they may be selected from among ten friends if two of the friends will not attend the party together is 112 b. 140 c. 164 d. none of these

116. If $^{n+1}C_3 = 2 \cdot {}^{n}C_2$ $then =$ 3 b. 4 c. 6 d. 5

117. The number of parallelograms that can be formed form a set of four parallel lines intersecting another set of three parallel lines is 6 b. 9 c. 12 d. 18