

Permutation and Combination

- Q 1.** How many numbers between 2000 and 3000 can be formed with the digits 0, 1, 2, 3, 4, 5, 6, 7 (repetition not allowed)?
- (a). 42
(b). 210
(c). 336
(d). 440
- Q 2.** How many numbers between 200 and 1200 can be formed with the digits 0, 1, 2, 3 (repetition of digits not allowed)?
- (a). 6
(b). 8
(c). 2
(d). 14
- Q 3.** How many 4 digit numbers are possible; criteria being that all the 4 digits are odd?
- (a). 125
(b). 625
(c). 4^5
(d). 120
- Q 4.** A captain and a vice-captain are to be chosen out of a team having 11 players. How many ways are there to achieve this?
- (a). 10×9
(b). ${}^{11}C_2$
(c). 110
(d). $10 \cdot 9!$
- Q 5.** There are five types of envelopes and four types of stamps in a post office. How many ways are there to buy an envelope and a stamp?
- (a). 20
(b). 4^5
(c). 5^4
(d). 9
- Q 6.** There are three rooms in a motel: one single, one double and one for four persons. How many ways are there to house seven persons in these rooms?
- (a). $\frac{7!}{1!2!4!}$
(b). $7!$
(c). $\frac{7!}{3}$
(d). $\frac{7!}{3!}$
- Q 7.** How many ways are there to choose four cards of different suits and different values from a deck of 52 cards?
- (a). 13.1211.10
(b). ${}^{52}C_4$
(c). 134
(d). 52.36.22.10
- Q 8.** In how many ways can 12 papers be arranged if the best and worst paper never come together?
- (a). $\frac{12!}{2!}$
(b). $12! - 11!$
(c). $\frac{12! - 11!}{2}$
(d). $12! - 2 \cdot 11!$
- Q 9.** In how many ways can the letters of the word EQUATION be arranged so that all vowels come together?
- (a). 9C_4
(b). $4!5!$
(c). $\frac{9!}{5!}$
(d). $9! - 4!5!$
- Q 10.** A man has 3 shirts, 4 trousers and 6 ties. What are the number of ways in which he can dress himself with the combination of all the three?
- (a). 13
(b). 72
(c). $\frac{13!}{3!4!6!}$
(d). $3!4!6!$
- Q 11.** How many motor vehicle registration numbers of 4 digits can be formed with the digits 0, 1, 2, 3, 4, 5 (no digit being repeated)?
- (a). 1080
(b). 120
(c). 300
(d). 360
- Q 12.** How many straight lines can be formed from 8 non collinear points on the X-Y plane?
- (a). 28
(b). 56
(c). 18
(d). 19860
- Q 13.** In how many ways can the letters of the word PATNA be rearranged?
- (a). 60
(b). 120
(c). 119
(d). 59

- Q 14.** In the above question, how many words would be there which would start with the letter P?
 (a). 24
 (b). 12
 (c). 60
 (d). 18
- Q 15.** How many 7 digit numbers are there having the digit 3 three times and the digit 5 four times?
 (a). $7!/(3!)(5!)$
 (b). $3^3 \times 5^5$
 (c). 7^7
 (d). 35
- Q 16.** How many 7 digit numbers are there having the digit 3 three times and the digit 0 four times?
 (a). 15
 (b). $3^3 \times 4^4$
 (c). 30
 (d). None of these
- Q 17.** There are ten subjects in the school day at St. Vincent's High school, but the sixth standard students have only five periods in a day. In how many ways can we form a timetable for the day for the sixth standard students? Assume a subject can be taught once a day.
 (a). 5^{10}
 (b). 10^5
 (c). 252
 (d). 30,240
- Q 18.** There are 8 consonants and 5 vowels in a word jumble. In how many ways can we form 5 letter words having 3 consonants and 2 vowels?
 (a). 67,200
 (b). 8540
 (c). 720
 (d). None of these
- Q 19.** How many batting orders are possible for the Indian cricket team if there is a squad of 15 to choose from such that Sachin Tendulkar is always chosen?
 (a). $1001.11!$
 (b). $364.11!$
 (c). $11!$
 (d). $15.11!$
- Q 20.** Several teams take part in a competition, each of which must play one game with all the other teams. How many teams took part in the competition if they played 45 games in all?
 (a). 5
 (b). 10
 (c). 15
 (d). 20
- Q 21.** How many different 5-letter words (with or without meaning) can be constructed using all the letters of the word 'DELHI' so that each word has to start with D and end with I?
 (a). 24
 (b). 18
 (c). 12
 (d). 6
- Q 22.** How many different sums can be formed with the denomination Rs. 50, Rs. 100, Rs. 200, Rs. 500, and Rs. 2,000 taking at least three denominations at a time?
 (a). 16
 (b). 15
 (c). 14
 (d). 10
- Q 23.** The number of parallelograms that can be formed from a set of four parallel lines intersecting another set of four parallel lines, is
 (a). 18
 (b). 24
 (c). 32
 (d). 36
- Q 24.** In how many ways can a person send invitation cards to 6 of his friends if he has four servants to distribute the cards?
 (a). 6^4
 (b). 4^6
 (c). 24
 (d). 120
- Q 25.** In how many ways can 5 prizes be distributed to 8 students if each student can get any number of prizes?
 (a). 40
 (b). 5^8
 (c). 8
 (d). 120
- Q 26.** How many triplets (x, y, z) satisfy the equation $x + y + z = 6$, where x, y and z are natural numbers?
 (a). 4
 (b). 5
 (c). 9
 (d). 10
- Q 27.** In how many ways can 10 identical presents be distributed among 6 children so that each child gets at least one present?
 (a). ${}^{15}C_5$
 (b). ${}^{16}C_6$
 (c). 9C_5
 (d). 6^{10}

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UPSC PT 2019

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Q 28. How many diagonals can be drawn by joining the vertices of an octagon?

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- (a). 20
- (b). 24
- (c). 28
- (d). 64

Q 29. Consider all 3-digit numbers (without repetition of digits) obtained using three non-zero digits which are multiples of 3. Let S be their sum.

Which of the following is/are correct?

- 1. S is always divisible by 74.
- 2. S is always divisible by 9.

Select the correct answer using the code given below:

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- (a). 1 only
- (b). 2 only
- (c). Both 1 and 2
- (d). d. Neither 1 nor 2

Q 30. Using 2, 2, 3, 3, 3 as digits, how many distinct numbers greater than 30000 can be formed ?

UPSC PT 2021

- (a). 3
- (b). 6
- (c). 9
- (d). 12

Q 31. How many 3-digit natural numbers (without repetition of digits) are there such that each digit is odd and the number is divisible by 5 ?

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- (a). 8
- (b). 12
- (c). 16
- (d). 24

Q 32. The letters A, B, C, D and E are arranged in such a way that there are exactly two letters between A and E. How many such arrangements are possible?

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- (a). 12
- (b). 18
- (c). 24
- (d). 36

Q 33. A, B and C are three places such that there are three different roads from A to B, four different roads from B to C and three different roads from A to C. In how many different ways can one travel from A to C using these roads?

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- (a). 10
- (b). 13
- (c). 15
- (d). 36

Q 34. One non-zero digit, one vowel and one consonant from English alphabet (in capital) are to be used in forming passwords, such that each password has to start with a vowel and end with a consonant. How many such passwords can be generated?

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- (a). 105
- (b). 525
- (c). 945
- (d). 1050

Q 35. There are 9 cups placed on a table arranged in equal number of rows and columns out of which 6 cups contain coffee and 3 cups contain tea. In how many ways can they be arranged so that each row should contain at least one cup of coffee?

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- (a). 18
- (b). 27
- (c). 54
- (d). 81.

Q 36. What is the number of numbers of the form 0.XY, where X and Y are distinct non-zero digits?

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- (a). 72
- (b). 81
- (c). 90
- (d). 100.

Q 37. How many distinct 8-digit numbers can be formed by rearranging the digits of the number 11223344 such that odd digits occupy odd positions and even digits occupy even positions?

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- (a). 12
- (b). 18
- (c). 36
- (d). 72

Q 38. ABCD is a square. One point on each of AB and CD; and two distinct points on each of BC and DA are chosen. How many distinct triangles can be drawn using any three points as vertices out of these six points?

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- (a). 16
- (b). 18
- (c). 20
- (d). 24

Q 39. What is the sum of all 4-digit numbers less than 2000 formed by the digits 1, 2, 3 and 4, where none of the digits is repeated?

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- (a). 7998
- (b). 8028
- (c). 8878
- (d). 9238

Q 40. What is the number of selections of 10 consecutive things out of 12 things in a circle taken in the clockwise direction?

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- (a). 3
- (b). 11
- (c). 12
- (d). 66

Q 41. In an examination, the maximum marks for each of the four papers namely P, Q, R and S are 100. Marks scored by the students are in integers. A student can score 99% in n different ways. What is the value of n ?

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- (a). 16
- (b). 17
- (c). 23
- (d). 35

Q 42. A flag has to be designed with 4 horizontal stripes using some or all of the colours red, green and yellow. What is the number of different ways in which this can be done so that no two adjacent stripes have the same colour ?

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- (a). 12
- (b). 18
- (c). 24
- (d). 36

Q 43. There are five persons P, Q, R, S and T each one of whom has to be assigned one task. Neither P nor Q can be assigned Task-1. Task-2 must be assigned to either R or S. In how many ways can the assignment be done?

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- (a). 6
- (b). 12
- (c). 18
- (d). 24

Q 44. There are four letters and four envelopes and exactly one letter is to be put in exactly one envelope with the correct address. If the letters are randomly inserted into the envelopes, then consider the following statements:

1. It is possible that exactly one letter goes into an incorrect envelope.
2. There are only six ways in which only two letters can go into the correct envelopes.

Which of the statements given above is/are correct?

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- (a). 1 only.
- (b). 2 only
- (c). Both 1 and 2
- (d). Neither 1 nor 2