

# NDA 1 2025

LIVE

# MATHS

PERMUTATION &  
COMBINATION - 1

# MCQS



NAVJYOTI SIR

Crack  
EXAMS



## 03 Feb 2025 Live Classes Schedule

9:00AM	03 FEBRUARY 2025 DAILY DEFENCE UPDATES	DIVYANSHU SIR
10:00AM	03 FEBRUARY 2025 DAILY CURRENT AFFAIRS	RUBY MA'AM

### AFCAT 1 2025 LIVE CLASSES

✓ 12:30PM	REASONING - DIRECTION & DISTANCE	RUBY MA'AM
✓ 3:00PM	STATIC GK - RIVERS, DAMS & RESERVOIRS IN INDIA	DIVYANSHU SIR

### NDA 1 2025 LIVE CLASSES

✓ 10:00AM	MATHS - PERMUTATION & COMBINATION - CLASS 1	NAVJYOTI SIR
✓ 11:30AM	MODERN HISTORY - CLASS 4	RUBY MA'AM
✓ 1:00PM	PHYSICS - GRAVITATION & HYDROSTATICS	NAVJYOTI SIR

### CDS 1 2025 LIVE CLASSES

✓ 11:30AM	MODERN HISTORY - CLASS 4	RUBY MA'AM
✓ 1:00PM	PHYSICS - GRAVITATION & HYDROSTATIC	NAVJYOTI SIR
✓ 5:30PM	MATHS - GEOMETRY - CLASS 1	NAVJYOTI SIR



# QUESTION

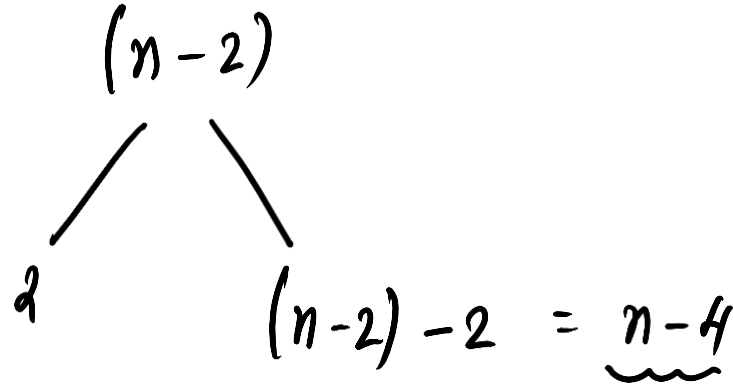
In how many ways can a student choose  $(n-2)$  courses out of  $n$  courses if 2 courses are compulsory ( $n > 4$ )?

(a)  $(n-3)(n-4)$

(b)  $(n-1)(n-2)$

(c)  $(n-3)(n-4)/2$

(d)  $(n-2)(n-3)/2$

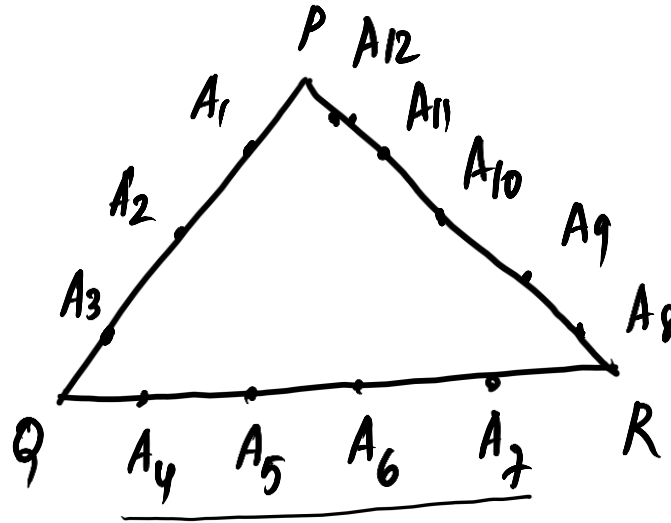


$$\begin{aligned}
 {}^{n-2}C_{n-4} &= {}^{n-2}C_{(n-2)-(n-4)} = {}^{n-2}C_2 = \frac{(n-2)(n-2-1)}{2!} \\
 &= \frac{(n-2)(n-3)}{2}
 \end{aligned}$$

${}^nC_r = {}^nC_{n-r}$

# QUESTION

A triangle  $PQR$  is such that 3 points lie on the side  $PQ$ , 4 points on  $QR$  and 5 points on  $RP$  respectively. Triangles are constructed using these points as vertices. What is the number of triangles so formed?



(a) 205

(b) 206

(c) 215

(d) 220

$${}^{12}C_3 - ({}^3C_3 + {}^4C_3 + {}^5C_3)$$

$$\frac{12 \times 11 \times 10}{3 \times 2} - \left( 1 + 4 + \frac{5 \times 4}{2} \right)$$

$$220 - (5 + 10) = 220 - 15 = 205$$



# QUESTION

In how many ways can the letters of the word INDIA be permuted such that in each combination, vowels should occupy odd positions?


(a) 3

(b) 6

(c) 9

(d) 12

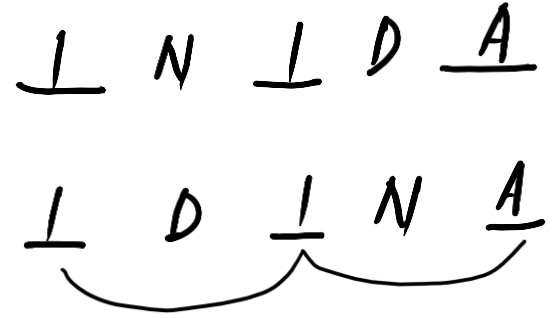
INDIA



$$\frac{3!}{2!} \times 2! = 3! = 6$$

I N I D A

I D I N A



# QUESTION

The letters of the word EQUATION are arranged in such a way that all vowels as well as consonants are together. How many such arrangements are there?

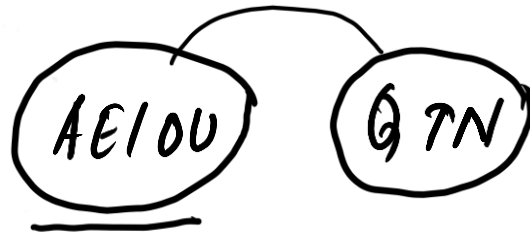
(a) 240

(b) 720

(c) 1440

(d) 1620

E Q U A T I O N



$$2! \times 5! \times 3! = 2 \times 120 \times 6$$

$$= 2 \times 720 =$$

1440

# QUESTION

What is the sum of all four digit numbers formed by using all digits 0, 1, 4, 5 without repetition of digits ?

- (a) 44440  
 (b) 46460  
 (c) 46440  
 (d) 64440

$$\begin{array}{r}
 \underline{1045} \\
 \underline{1054} \\
 \underline{1405} \\
 \underline{1450} \\
 \underline{1504} \\
 \underline{1540}
 \end{array}$$

$$\begin{array}{cccc}
 \underline{3} & \underline{3} & \underline{2} & \underline{1} \\
 (1,4,5) & & & 
 \end{array}$$

=  $3 \times 3 \times 2 \times 1 = 18$  such numbers are possible.

Sum of thousand places

$$(1000 \times 6 + 4000 \times 6 + 5000 \times 6)$$

$$6000 + 24000 + 30000 = \underline{60000}$$

Ans. (d),

# QUESTION

A man has 7 relatives (4 women and 3 men). His wife also has 7 relatives (3 women and 4 men). In how many ways can they invite 3 women and 3 men so that 3 of them are man's relatives and 3 of them are his wife's relatives?



$$\binom{4}{3} \times \binom{4}{3} + \binom{3}{3} \times \binom{3}{3} + \binom{4}{2} \times \binom{3}{1} \times \binom{3}{1} \times \binom{4}{2}$$

$$+ \binom{4}{1} \times \binom{3}{2} \times \binom{3}{2} \times \binom{4}{1}$$

$$= (4 \times 4) + (1 \times 1) + (6 \times 3 \times 3 \times 6) + (4 \times 3 \times 3 \times 4)$$

$$= 16 + 1 + 324 + 144 =$$

Ans. (c)

(a) 340

(b) 484

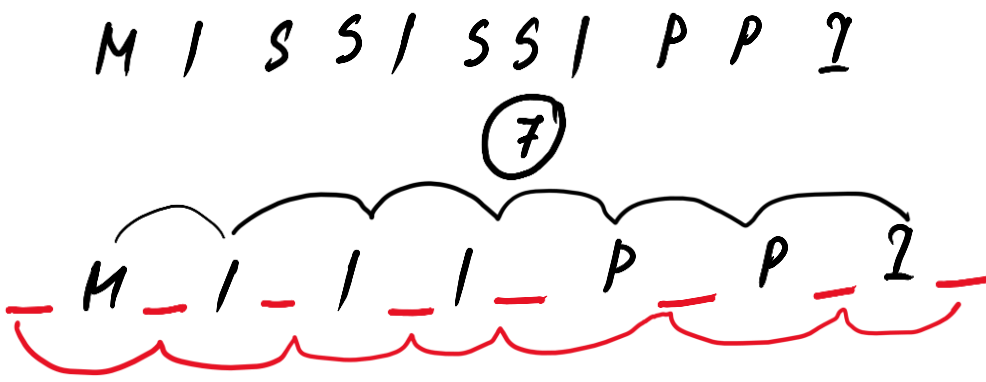
(c) 485

(d) 469



Q) How many different words can be formed by jumbling the letters in the word MISSISSIPPI in which no two S are adjacent?

- (a)  $8 \cdot {}^6C_4 \cdot {}^7C_4$                       (b)  $6 \cdot 7 \cdot {}^8C_4$   
 (c)  $6 \cdot 8 \cdot {}^7C_4$                       (d)  $7 \cdot {}^6C_4 \cdot {}^8C_4$



⑧ positions at which  
 S can be kept

$${}^8C_4 \times \frac{7!}{4! 2!}$$

$${}^8C_4 \times 7 \times \frac{6!}{4! 2!} = \underline{{}^8C_4 \times 7 \times {}^6C_4}$$

Ans. (d)

Q) How many different words can be formed by jumbling the letters in the word MISSISSIPPI in which no two S are adjacent?

(a)  $8 \cdot {}^6C_4 \cdot {}^7C_4$

(b)  $6 \cdot 7 \cdot {}^8C_4$

(c)  $6 \cdot 8 \cdot {}^7C_4$

(d)  $7 \cdot {}^6C_4 \cdot {}^8C_4$

Ans: (d)

Q) What is the number of three-digit odd numbers formed by using the digits 1, 2, 3, 4, 5, 6 if repetition of digits is allowed?

(a) 60

(b) 108

(c) 120

(d) 216

$$\begin{array}{c} \underline{6} \quad \underline{6} \quad \underline{3} \\ \quad \quad \quad \downarrow \\ \quad \quad \quad \text{odd digit} \end{array} = 6 \times 6 \times 3 = 36 \times 3 = \underline{108}$$

(1, 2, 3, 4, 5, 6)

**Q)** What is the number of three-digit odd numbers formed by using the digits 1, 2, 3, 4, 5, 6 if repetition of digits is allowed?

(a) 60

(b) 108

(c) 120

(d) 216

**Ans: (b)**

# Directions

Consider the letters of the word 'Krishna'.

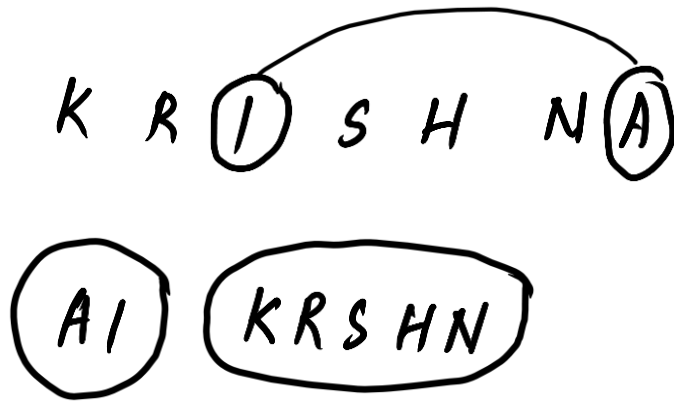


Q) How many words can be formed the vowels are not separated?

- (a) 1250
- (c) 1440

- (b) 550
- (d) None of these

→ vowels  
are together



Q) How many words can be formed the vowels are not separated?

(a) 1250

(b) 550

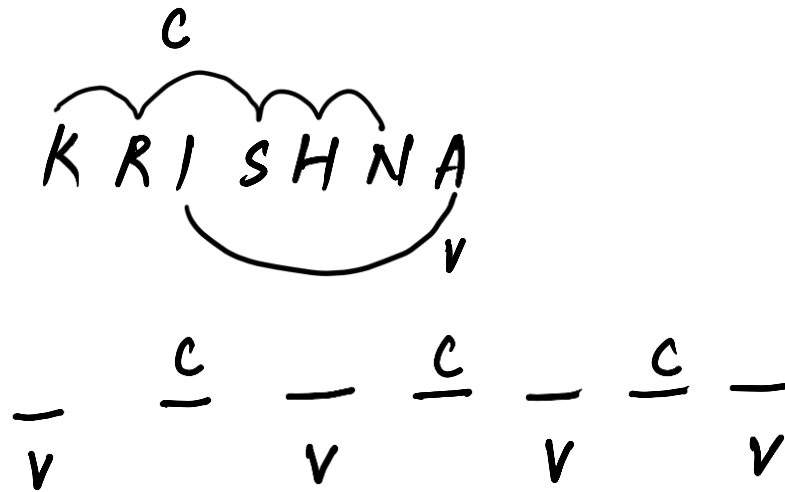
(c) 1440

(d) None of these

**Ans: (c)**

Q) How many words can be formed the vowels may occupy only odd places?

- (a) 100            (b) 720  
(c) 700            (d) 4



A1 → vowels (v)

$$2 \times {}^4C_2 \times {}^5P_3$$

$$2 \times \frac{4 \times 3}{2} \times 5 \times 4 \times 3$$

$$= 12 \times 30 = \underline{360} \times 2 = \boxed{720}$$

Q) How many words can be formed the vowels may occupy only odd places?

- (a) 100            (b) 720  
(c) 700            (d) 4

**Ans: (b)**

Q) How many words can be formed begin with  $s$  and end in  $k$  ?

(a) 150

(b) 70

(c) 200

(d) 120

$\underline{s}$        $\underline{k}$

$$5! = \underline{120}$$



**Q)** How many words can be formed begin with  $s$  and end in  $k$  ?

(a) 150

(b) 70

(c) 200

(d) 120

**Ans: (d)**

Q) What is the number of different messages that can be represented by three 0's and two 1's?

(a) 10

(b) 9

(c) 8

(d) 7

0 0 0 1 1

$$\frac{5!}{3! 2!} = \frac{120}{6 \times 2} = 10$$

**Q)**What is the number of different messages that can be represented by three 0's and two 1's?

(a) 10

(b) 9

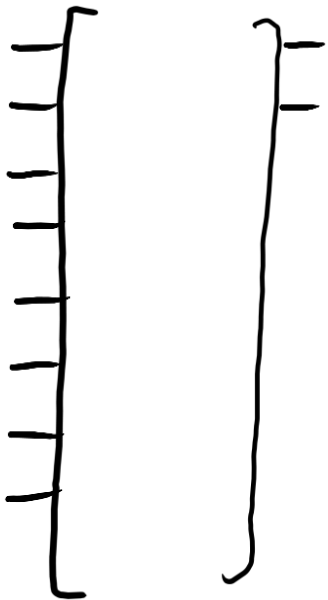
(c) 8

(d) 7

**Ans: (a)**

Q) A tea party is arranged for 16 people along two sides of a long table with eight chairs on each side. Four particular men wish to sit on one particular side and two particular men on the other side. The number of ways they can be seated is

- (a)  $24 \times 8! \times 8!$     (b)  $(8!)^3$     (c)  $210 \times 8! \times 8!$     (d)  $16!$



$$\begin{aligned}
 & {}^8P_4 \times {}^8P_2 \times {}^{10}P_{10} \\
 & \frac{8 \times 7 \times 6 \times 5 \times 8 \times 7 \times 10!}{8! \times 8! \times 7 \times 10 \times 8} = (8!)^2 \times 210
 \end{aligned}$$

Handwritten solution showing the calculation of the number of ways to seat 16 people, with 4 men on one side and 2 men on the other. The calculation involves permutations:  ${}^8P_4 \times {}^8P_2 \times {}^{10}P_{10}$ . The final result is  $(8!)^2 \times 210$ .

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- (a)  $24 \times 8! \times 8!$    (b)  $(8!)^3$    (c)  $210 \times 8! \times 8!$    (d)  $16!$

**Ans: (c)**



Q) Three-digit numbers are formed from the digits 1, 2 and 3 in such a way that the digits are not repeated. What is the sum of such three-digit numbers?

(a) 1233

(b) 1322

(c) 1323

(d) 1332

Q) Three-digit numbers are formed from the digits 1, 2 and 3 in such a way that the digits are not repeated. What is the sum of such three-digit numbers?

- (a) 1233      (b) 1322      (c) 1323      (d) 1332

Ans: (d)





Q) A polygon has 44 diagonals. The number of its sides is

(a) 11

(b) 10

(c) 8

(d) 7

${}^n C_2 - n$  = number of diagonals for a polygon of  $n$ -sides.

$$\frac{n(n-1)}{2} - n$$

$$\frac{n^2 - n - 2n}{2} = \frac{n^2 - 3n}{2} = \frac{n(n-3)}{2}$$

$$44 = \frac{n(n-3)}{2}$$

(a) ✓  
11

put options  
and check

Q) A polygon has 44 diagonals. The number of its sides is

(a) 11

(b) 10

(c) 8

(d) 7

**Ans: (a)**

Q) If the letters of the word SACHIN are arranged in all possible ways and these words are written out as in dictionary, then the word SACHIN appears at serial number

- (a) 601      (b) 600      (c) 603      (d) 602

Q) If the letters of the word SACHIN are arranged in all possible ways and these words are written out as in dictionary, then the word SACHIN appears at serial number

- (a) 601      (b) 600      (c) 603      (d) 602

**Ans: (a)**



**Q)** What is the number of ways in which an examiner can assign 10 marks to 4 question giving not less than 2 marks to any question? (All questions carry marks equal to integral value)

(a) 4

(b) 6

(c) 10

(d) 16



Q) If  $n!$  has 17 zeros, then what is the value of  $n$ ?

(a) 95

(b) 85

(c) 80

(d) No such value of  $n$  exists

Q) If  $n!$  has 17 zeros, then what is the value of  $n$ ?

(a) 95

(b) 85

(c) 80

(d) No such value of  $n$  exists

**Ans: (b)**

Q) What is  $C(47, 4) + C(51, 3) + C(50, 3) + C(49, 3) + C(48, 3) + C(47, 3)$  equal to?

(a)  $C(47, 4)$

(b)  $C(52, 5)$

(c)  $C(52, 4)$

(d)  $C(47, 5)$

Q) What is  $C(47, 4) + C(51, 3) + C(50, 3) + C(49, 3) + C(48, 3) + C(47, 3)$  equal to?

(a)  $C(47, 4)$

(b)  $C(52, 5)$

(c)  $C(52, 4)$

(d)  $C(47, 5)$

**Ans: (c)**

Q) There are 10 points in a plane. No three of these points are in a straight line. What is the total number of straight lines which can be formed by joining the points?

(a) 90

(b) 45

(c) 40

(d) 30

Q) There are 10 points in a plane. No three of these points are in a straight line. What is the total number of straight lines which can be formed by joining the points?

(a) 90

(b) 45

(c) 40

(d) 30

**Ans: (b)**



Q) How many words can be formed from the letters of the word 'ARTICLE', if vowels always comes at the odd places?

(a) 60

(b) 576

(c)  $\frac{7!}{3!}$

(d) 120

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(a) 60

(b) 576

(c)  $\frac{7!}{3!}$

(d) 120

Ans: (b)

**Q)** From 6 programmers and 4 typists, an office wants to recruit 5 people. What is the number of ways this can be done so as to recruit at least one typist?

(a) 209

(b) 210

(c) 246

(d) 242

Q) From 6 programmers and 4 typists, an office wants to recruit 5 people. What is the number of ways this can be done so as to recruit at least one typist?

- (a) 209                      (b) 210  
(c) 246                      (d) 242

**Ans: (c)**

**Q)** The number of ways in which 6 men and 5 women can dine at a round table if no two women are to sit together is given by

- (a)  $7! \times 5!$  (b)  $6! \times 5!$  (c)  $30!$  (d)  $5! \times 4!$

- Q) The number of ways in which 6 men and 5 women can dine at a round table if no two women are to sit together is given by
- (a)  $7! \times 5!$  (b)  $6! \times 5!$  (c)  $30!$  (d)  $5! \times 4!$

**Ans: (b)**

**Q)** How many 4-letter words (with or without meaning) containing two vowels can be constructed using only the letters (without repetition) of the word 'LUCKNOW'?

- (a) 240                      (b) 200  
(c) 150                      (d) 120

**Q)** How many 4-letter words (with or without meaning) containing two vowels can be constructed using only the letters (without repetition) of the word 'LUCKNOW'?

- (a) 240                      (b) 200  
(c) 150                      (d) 120

**Ans: (a)**



**Q)**In a football championship, a total of 153 matches was played. Every two teams played one match with each other. What is the total number of teams which took part in the championship?

(a) 17

(b) 18

(c) 19

(d) 21



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