NDA 1 2025

LIVE

MATHS

PERMUTATION & COMBINATION - 2

MCQS

NAVJYOTI SIR

Crack
EXAMS

04 Feb 2025 Live Classes Schedule

9:00AM	04 FEBRUARY 2025 DAILY DEFENCE UPDATES	DIVYANSHU SIR
10:00AM	04 FEBRUARY 2025 DAILY CURRENT AFFAIRS	RUBY MA'AM

SSB INTERVIEW LIVE CLASSES

9:30AM	ONLINE COURSE INTRODUCTION	ANURADHA MA'AM

AFCAT 1 2025 LIVE CLASSES

12:30PM	REASONING - FIGURE COMPLETION	RUBY MA'AM
3:00PM	STATIC GK - WORLD HERITAGE SITES IN INDIA	DIVYANSHU SIR
4:30PM	ENGLISH - IDIOMS & PHRASES - CLASS 1	ANURADHA MA'AM

NDA 1 2025 LIVE CLASSES

10:00AM	MATHS - PERMUTATION & COMBINATION - CLASS 2	NAVJYOTI SIR
11:30AM	HISTORY COMBINED MCQS	RUBY MA'AM
1:00PM	PHYSICS - ELECTRICITY	NAVJYOTI SIR
4:30PM	ENGLISH - IDIOMS & PHRASES - CLASS 1	ANURADHA MA'AM

CDS 1 2025 LIVE CLASSES

11:30AM	HISTORY COMBINED MCQS	RUBY MA'AM
1:00PM	PHYSICS - ELECTRICITY	NAVJYOTI SIR
4:30PM	ENGLISH - IDIOMS & PHRASES - CLASS 1	ANURADHA MA'AM
5:30PM	MATHS - GEOMETRY - CLASS 2	NAVJYOTI SIR

Q) In how many ways can the letters of the word CORPORATION be arranged so that vowels always occupy even places ?

(a) 120 (b) 2700

(c) 720 (d) 7200

$$\frac{5!}{3!} \times \frac{6!}{2!}$$

CRPRTN OOAIO

C _ C _ C _ C _ C _ C

V V V V V

$= 5 \times 4 \times 6 \times 5 \times 4 \times 3$

$= 120 \times 60$

$= 7200$

Q) In how many ways can the letters of the word CORPORATION be arranged so that vowels always occupy even places ?

(a) 120
(b) 2700
(c) 720
(d) 7200

Ans: (d)

Q) If all permutations of the letters of the word 'LAGAN' are arranged as in dictionary, then what is the rank of 'NAAGL'?

(a) 48th word (b) 49th word

(c) 50th word (d) 51st word

AAGLN —— (1)

Words starting with A = $4! = 24$

" " G (AALN) = $\frac{4!}{2!} = 12$

" " L (AAGN) = $\frac{4!}{2!} = 12$

$24 + 12 + 12 = 48$

Word starting with N = first word = NAAGL

49th word

Q) If all permutations of the letters of the word 'LAGAN' are arranged as in dictionary, then what is the rank of 'NAAGL'?

(a) 48th word
(b) 49th word
(c) 50th word
(d) 51st word

Ans: (b)

Q) What is $\dfrac{(n+2)!+(n+1)\,(n-1)!}{(n+1)\,(n-1)!}$ equal to ?

(a) 1
(b) Always an odd integer
(c) A perfect square
(d) None of the above

$8! = 8 \times 7!$

$= 8 \times 7 \times 6!$

$$\frac{(n+2)(n+1)\,n\,(n-1)! + (n+1)(n-1)!}{(n+1)(n-1)!}$$

$$= \frac{(n+2)\,n+1}{1} = n^2 + 2n + 1 = (n+1)^2$$

$(n+1)^2$ → perfect square

Q) What is $\frac{(n+2)!+(n+1)\,(n-1)!}{(n+1)\,(n-1)!}$ equal to ?

(a) 1
(b) Always an odd integer
(c) A perfect square
(d) None of the above

Ans: (c)

Q) A group consists of 5 men and 5 women. If the number of different five-person committees containing k men and (5–k) women is 100, what is the value of k ?

(a) 2 only (b) 3 only

(c) 2 or 3 (d) 4

$${}^5C_k \times {}^5C_{5-k} = 100$$

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

$$({}^5C_k)^2 = 100$$

$${}^5C_k = 10 \Rightarrow \frac{5!}{k!\,(5-k)!} = 10$$

put from options,

(c) 2 or 3

Q) A group consists of 5 men and 5 women. If the number of different five-person committees containing k men and (5–k) women is 100, what is the value of k ?

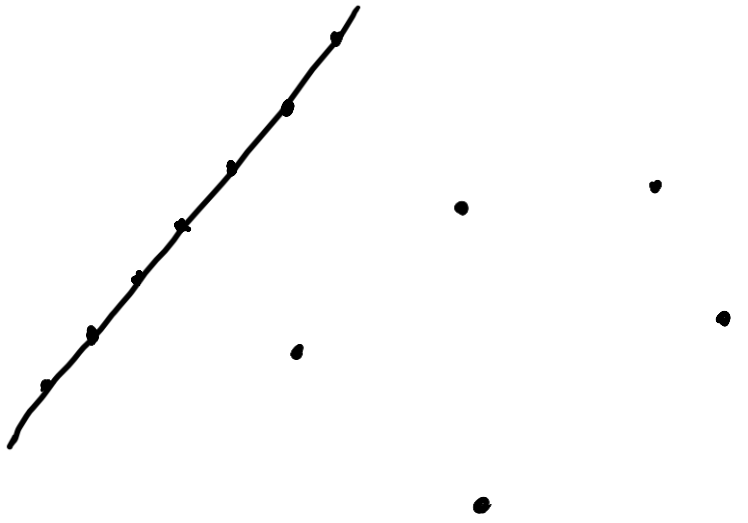
(a) 2 only
(b) 3 only
(c) 2 or 3
(d) 4

Ans: (c)

Q) If 7 points out of 12 are in the same straight line, then what is the number of triangles formed ?

(a) 84 (b) 175

(c) 185 (d) 201



Total

$^{12}C_3 - {}^{7}C_3$ number of collinear points

$= \frac{12 \times 11 \times 10}{3!} - \frac{7 \times 6 \times 5}{3!}$

$= 220 - 35 = 185$

Q) If 7 points out of 12 are in the same straight line, then what is the number of triangles formed ?

(a) 84 (b) 175

(c) 185 (d) 201

Ans: (c)

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

(a) $8.{}^{6}C_{4}.{}^{7}C_{4}$

(b) $6.7.{}^{8}C_{4}$

(c) $6.8.{}^{7}C_{4}.$

(d) $7.{}^{6}C_{4}.{}^{8}C_{4}$

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

(a) $8.{}^{6}C_{4}.{}^{7}C_{4}$

(b) $6.7.{}^{8}C_{4}$

(c) $6.8.{}^{7}C_{4}.$

(d) $7.{}^{6}C_{4}.{}^{8}C_{4}$

Ans: (d)

Q) What is the total number of combination of n different things taken 1, 2, 3, ..., n at a time?

(a) 2^{n+1}

(b) 2^{2n+1}

(c) 2^{n-1}

(d) $2^{n}-1$

$${}^{n}C_1 + {}^{n}C_2 + {}^{n}C_3 + \ldots {}^{n}C_n$$

$${}^{n}C_0 + {}^{n}C_1 + {}^{n}C_2 + {}^{n}C_3 + \ldots {}^{n}C_n = 2^n$$

(1)

$${}^{n}C_1 + {}^{n}C_2 + {}^{n}C_3 + \ldots {}^{n}C_n = 2^n - 1$$

Q) What is the total number of combination of n different things taken 1, 2, 3, ..., n at a time?

(a) 2^{n+1}

(b) 2^{2n+1}

(c) 2^{n-1}

(d) $2^{n}-1$

Ans: (d)

Q) What is the value of n, if $P(15, n-1) : P(16, n-2) = 3 : 4$?

(a) 10 (b) 12

(c) 14 (d) 15

$${}^{n}P_{r} = \frac{n!}{(n-r)!}$$

$$\frac{{}^{15}P_{n-1}}{{}^{16}P_{n-2}} = \frac{3}{4}$$

$$\frac{\frac{15!}{(15-n+1)!}}{\frac{16!}{(16-n+2)!}} = \frac{3}{4}$$

$$\frac{(18-n)!}{16(16-n)!} = \frac{3}{4}$$

$$n! = n(n-1)(n-2)!$$

$$\frac{(18-n)!}{16(16-n)!} = \frac{3}{4}$$

$$\frac{(18-n)(17-n)(16-n)!}{16(16-n)!} = \frac{3}{4}$$

$$48 = 4(18-n)(17-n)$$

10 , 12 , 14 ✓, 15

Q) What is the value of n, if $P(15, n-1) : P(16, n-2) = 3 : 4$?

(a) 10 (b) 12

(c) 14 (d) 15

Ans: (c)

Q) If $a_n = n(n!)$, then what is $a_1 + a_2 + a_3 + \ldots + a_{10}$ equal to?

(a) $10! - 1$ (b) $11! + 1$

(c) $10! + 1$ (d) $11! - 1$

$a_n = (n+1-1)\,n! = (n+1)\,n! - n! = (n+1)! - n!$

$a_1 = 2! - 1!$

$a_2 = 3! - 2!$

$a_3 = 4! - 3!$

$\vdots$

$a_{10} = 11! - 10!$

$a_1 + a_2 + \ldots a_{10}$

$= 11! - 1! = \boxed{11! - 1}$

Q) If $a_n = n(n!)$, then what is $a_1 + a_2 + a_3 + \ldots + a_{10}$ equal to?

(a) $10! - 1$ (b) $11! + 1$

(c) $10! + 1$ (d) $11! - 1$

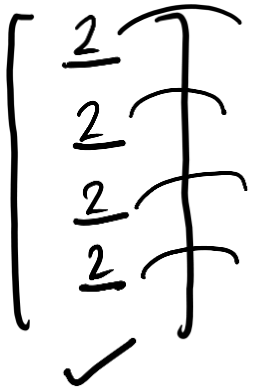
Ans: (d)

Q) How many distinct matrices exist with all four entries taken from {1, 2}?

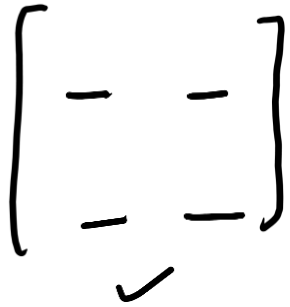
(a) 16 (b) 24
(c) 32 (d) 48

{1, 2}

4 x 1



2 x 2



1 x 4

$2^4 \times 3 = 16 \times 3 =$ 48

Q) How many distinct matrices exist with all four entries taken from {1, 2}?

(a) 16 (b) 24

(c) 32 (d) 48

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

ACHINS ⟶

A (CHINS) ⟶ 5! = 120

C (AHINS) ⟶ 5! = 120

H (ACINS) ⟶ 5! = 120

I (ACHNS) ⟶ 5! = 120

N (ACHIS) ⟶ 5! = 120

S (ACHIN)

120 × 5 + 1 = 601

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) A man has 7 friends. In how many ways he can invite one or more of them for a tea party?

(a) 128 (b) 256

(c) 127 (d) 130

$${}^7C_1 + {}^7C_2 + {}^7C_3 + {}^7C_4 + {}^7C_5 + {}^7C_6 + {}^7C_7$$

$$= 7 + 21 + 35 + 35 + 21 + 7 + 1$$

$$= 112 + 15 = \boxed{127}$$

Q) A man has 7 friends. In how many ways he can invite one or more of them for a tea party?

(a) 128
(b) 256
(c) 127
(d) 130

Ans: (c)

Q) In how many ways can 7 persons stand in the form of a ring?

(a) $P(7,2)$ (b) $7!$

(c) $6!$ (d) $\frac{7!}{2}$

Circular permutations,

$= (n-1)! = 6!$

Q) In how many ways can 7 persons stand in the form of a ring?

(a) $P(7,2)$

(b) $7!$

(c) $6!$

(d) $\frac{7!}{2}$

Ans: (c)

NDA 1 2025

LIVE

MATHS

BINOMIAL THEOREM

MCQS

NAVJYOTI SIR

Crack
EXAMS