SBI PO MAINS 2020-21

की तैयारी कैसे करें ?

Combination

(Special Case of FPC) - Low

पढ़ना नहीं, सीखना है

04:00 PM

MATHS

Mahendra's

Mahendra's has Started its Branch-wise Online Class.

Visit "Live Classes" on myshop.mahendras.org for Online Admission

Analysis/विश्लेषण

Combinations: Another View of Permutation

संचय: क्रमचय का एक और रूप

Selection

A, B, C

$^3P_2 = 6$

Same: AB, BA

Same: BC, CB

Same: CA, AC

3 or 3 ⇒ Same Selection (Order doesn't matter)

⇒ No. of Combination of three players taking 2 players at a time ⇒ $^3C_2 = 3$

$^3P_2 = 6 = 3 \times 2$

$^3P_2 = {}^3C_2 \times 2!$

$^3C_2 = \frac{^3P_2}{2!} = \frac{3!}{2!(3-2)!}$

$^nP_r = {}^nC_r \times r!$

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

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Combinations: Another View of Permutation

संचय: क्रमचय का एक और रूप

$^{100}C_{98}$

$= {}^{100}C_{100-98}$

$= {}^{100}C_2 = \frac{100 \times 99}{2 \times 1}$

$\therefore {}^7C_5 = {}^7C_2$

$\Rightarrow {}^7C_5 = {}^7C_{7-5}$

① $^nP_r = {}^nC_r \times r!$

① $\Rightarrow \boxed{{}^nC_r = {}^nC_{n-r}}$

② $^nC_r = \frac{n!}{r!(n-r)!}$

② $^nC_1 = n$

③ $^nC_n = 1 = {}^nC_0$

$\rightarrow {}^nC_{n-n}$

Note 1

Equal

$= {}^7C_2 = \frac{7C_2}{2!(7-2)!} = \frac{7 \times 6}{2 \times 1} = 21$

Equal

$^7C_5 = \frac{7 \times 6 \times 5 \times 4 \times 3}{5 \times 4 \times 3 \times 2 \times 1} = 21$

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In how many ways can a cricket team of playing-11 can be formed out of 15 players.

15 खिलाडियों में से 11 खिलाडियों की एक टीम कुल कितने विभिन्न तरीके से बनायीं जा सकती है.

$$^{15}C_{11} = {}^{15}C_{15-11}$$

$$= {}^{15}C_4$$

$$= \frac{15 \times 14 \times 13 \times 12}{(4 \times 3 \times 2 \times 1)}$$

$$= 105 \times 13$$

$$= 1365 \text{ (Ans)}$$

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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?

2 पुरुषों और 3 महिलाओं के एक समूह से 3 व्यक्तियों की एक समिति बनानी है यह कितने प्रकार से किया जा सकता है इनमें से कितनी समितियां ऐसी हैं जिनमें 1 पुरुष तथा 2 महिलाएं हैं?

2M ; 3W

Total = 5 persons

3 person

$^5C_3 = {}^5C_{5-3}$

$= {}^5C_2$

$= \frac{5\times4}{2\times1} = 10$ Ans

1_1 and 1_2

*2M and 3W

*1M *2W

$^2C_1 \times {}^3C_2$

$= \frac{2\times1}{1} \times \frac{3\times2}{2\times1}$

$= 2\times3$

$= 6$ (Ans)

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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.

6 लाल रंग की 5 सफेद रंग की और 5 नीले रंग की गेंदों में से 9 गेंदों के चुनने के तरीकों की संख्या ज्ञात कीजिए यदि प्रत्येक संग्रह में प्रत्येक रंग की तीन गेंदे हैं.

Y_1 and Y_2 and Y_3

R and W and B

6 5 5

3 3 3

$^6C_3 \times {}^5C_3 \times {}^5C_3$

$= 20 \times 10 \times 10$

$= 2000$ (Ans)

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

5 लड़के और 4 लड़कियों में से 3 लड़के और 3 लड़कियों की टीम टीम में बनाने के कितने तरीके हैं?

B and G

5 4

3B 3G

$^5C_3 \times {}^4C_3$

$= 10 \times 4$

$= 40$ (Ans).

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

17 खिलाड़ियों में से केवल पांच खिलाडी गेंदबाजी कर सकता हैं. एक क्रिकेट टीम के 11 खिलाड़ियों का चयन कितने प्रकार से किया जा सकता है यदि प्रत्येक टीम में तथ्यत: चार गेंदबाज हैं?

17 Players.

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

Batsman and Bowler

$17-5 = 12$ | 5

$11-4 = 7$ | 4

$^{12}C_7 \times {}^5C_4$

$\Rightarrow {}^{12}C_5 \times {}^5C_1 = \frac{12 \times 11 \times 10 \times 9 \times 8}{120} \times 5$

Ans = 3960

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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?

9 उपलब्ध पाठ्यक्रमों में से एक विद्यार्थी 5 पाठ्यक्रम का चयन कितने प्रकार से कर सकता है यदि प्रत्येक विद्यार्थी के लिए दो विशिष्ट पाठ्यक्रम अनिवार्य है?

9 Courses

Compulsory = 2 → 2 → $^2C_2$ = 1

Optional = 9 − 2 = 7* → 5 − 2 = 3* → $^7C_3$

$\times$ $^7C_3$ $\times$ $\frac{7\times6\times5}{3\times2}$ = 1 × 35 = 35 (Ans).

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There are 16 players in a cricket team. In how many different ways can a playing-11 can be formed so that:

एक क्रिकेट टीम में 16 खिलाडी है. 11 खिलाडियों की टीम कुल कितने विभिन्न तरीके से बनायीं जा सकती है ताकि:

1. One player is always included in the team.

एक विशेष खिलाडी हमेशा टीम में रहे.

16 Players

fix = 1 → $1C_1$

Optional = 15 → $11-1 = 10$ → $^{15}C_{10}$ → $^{15}C_5$

$= 1 \times \frac{15 \times 14 \times 13 \times 12 \times 11}{120}$

$= 1 \times 21 \times 13 \times 11 = 3003$

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बाहर

2. Two players are always excluded from the team.

दो विशेष खिलाड़ी कभी भी टीम में ना रहे.

16

2 → 0 → $^2C_0$

14 → 11 → $^{14}C_{11}$ → $^{14}C_3$

$= 1 \times \frac{14 \times 13 \times 12}{3 \times 2}$

$= 14 \times 26$

$= 364$ (Ans).

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एक क्रिकेट टीम में 16 खिलाडी है. 11 खिलाडियों की टीम कुल कितने विभिन्न तरीके से बनायीं जा सकती है ताकि:

3. Two players are always included in the team while one player is always excluded from the team.

दो विशेष खिलाडी हमेशा टीम में रहे और एक विशेष खिलाडी कभी भी टीम में ना रहे.

16

fix = 2 → 2

Never 1 → 0

16 − (2+1) = 13 → 11 − 2 = 9

$^{2}C_2 \times {}^{1}C_0 \times {}^{13}C_9$

$= 1 \times 1 \times \frac{13 \times 12 \times 11 \times 10}{24}$

$= 13 \times 55 = 715$ (Ans)

$^{13}C_4$

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In 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 choosen?

25 विदयार्थियों की एक कक्षा से 10 का चयन एक भ्रमण दल के लिए किया जाता है. 3 विदयार्थी ऐसे हैं जिन्होंने यह निर्णय लिया है कि या तो वे तीनों दल में शामिल होंगे या उनमें से कोई भी दल में शामिल नहीं होगा. भ्रमण दल का चयन कितने प्रकार से किया जा सकता है

25

Option 1 or Option 2

3 → 3 ; 22 → 10-3=7 ; 3 → 0 ; 22 → 10

$$\left({}^{3}C_{3} \times {}^{22}C_{7}\right) + \left({}^{3}C_{0} \times {}^{22}C_{10}\right)$$

$$1 \times {}^{22}C_{7} + 1 \times {}^{22}C_{10}$$

$$\Rightarrow \left({}^{22}C_{7} + {}^{22}C_{10}\right)$$

Ans

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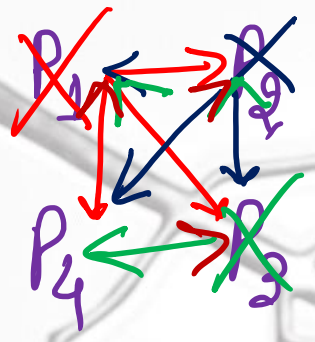
There are 15 persons in a party. If each person shakes hand with every other person exactly once; find how many handshakes would take place?

एक पार्टी में कुल 15 व्यक्ति है. यदि प्रत्येक व्यक्ति हर दुसरे व्यक्ति से केवल एक बार हाथ मिलाये तो बताइए कुल तरीके से हाथ मिलाया गया?



$3+2+1+0$

$= 6$

or

$H.S. = {}^4C_2$

$= \frac{4\times3}{2\times1}$

$= 6$

Match

$H.S. = {}^nC_2$

$= {}^{15}C_2$

$= \frac{15\times14}{2\times1}$

$= 105$ (Ans).

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Mind Twister/दिमाग घुमा देने वाला:

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

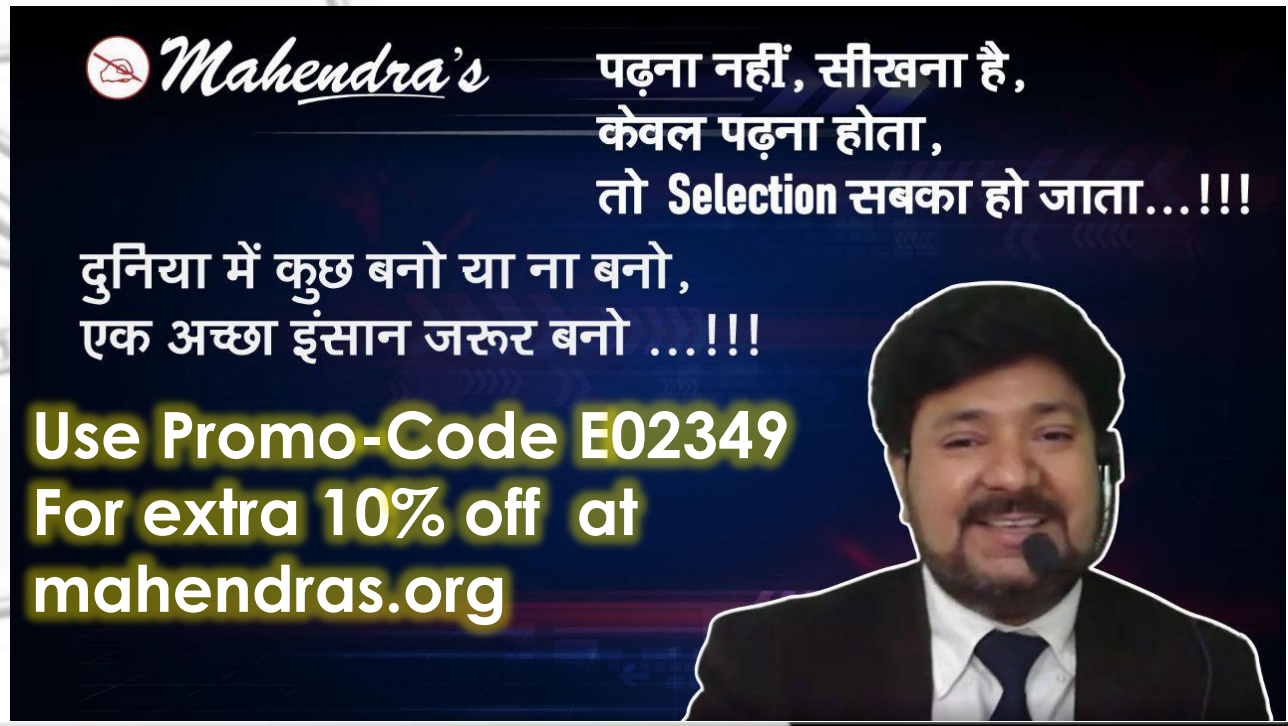
INVOLUTE शब्द के अक्षरों से अर्थपूर्ण या अर्थहीन, प्रत्येक 3 स्वर तथा 2 व्यंजनों वाले कितने शब्दों की रचना की जा सकती है?

Stay tuned – 16 Jan - at 4:00 pm

Combination

(Special Case of FPC) - Moderate –

पढ़ना नहीं, सीखना है



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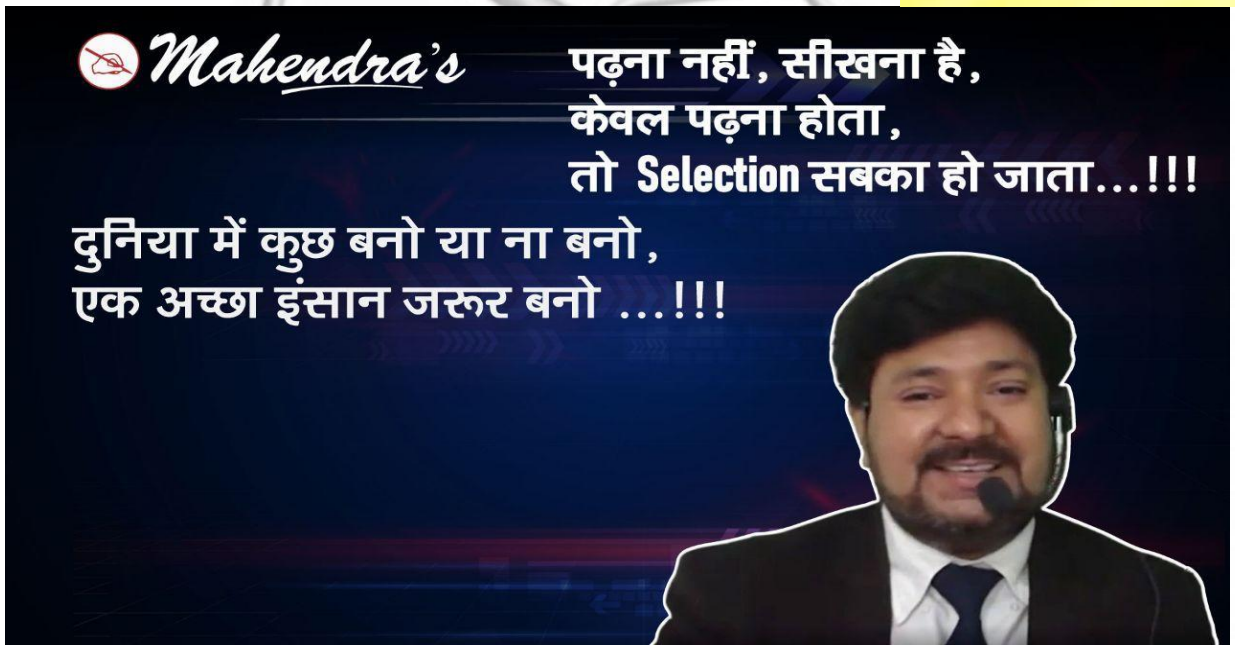

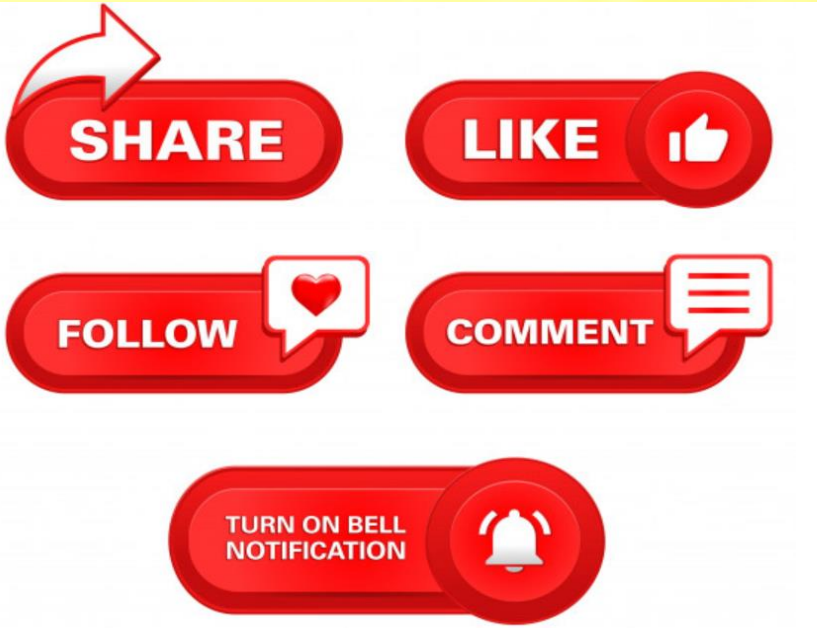

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