unacademy

unacademy

# Permutation Combination & Probability - Part III

Complete Course on General Aptitude - GATE & ESE, 2024 & 2025

**Saurabh Thakur** • Lesson 17 • May 25, 2023

unacademy

UNACADEMY
PLUS CLASS
unacademy
COMPLETE
COURSE ON
General Aptitude for
GATE 2024/25
USE CODE ST26
Saurabh Sir

unacademy
32M+
WATCH MINUTE
12+
YEARS TEACHING EXPERIENCE
SUBSCRIPTION
CODE : ST26
SAURABH THAKUR
IIM ROHTAK
unacademy

unacademy

$\boxed{+/\times.}$

# P/C

OR $\Rightarrow$ choice $\rightarrow$ $+$ $\rightarrow \cup$

AND $\rightarrow$ No choice $\rightarrow \times \rightarrow \cap$

unacademy

1 | 2 | 3 | 4

$\boxed{1}$

__ __ __

$\boxed{R \checkmark}$ $\underline{4} \times \underline{4} \times \underline{4}$

$R\alpha.$ $\underline{4} \times \underline{3} \times \underline{2}$

$\boxed{64}$

$\boxed{24}$

unacademy

1 | 2 | 3 | 4

1

— — —

R✓ $4 \times 4 \times 4$ = 64

Rx. $4 \times 3 \times 2$ = 24

2 $\frac{\div 4}{\div 4}$ ⟹ N ⟹ Last 2 DIGITS.

R✓ $\frac{4}{1-4}$ [ — — ]

$4 \times 4$ = 16

12 | 44

24

32

Rx $\frac{2}{1-4}$ [ — — ] × 3 cases

06

1 2 | ~~44~~

2 4

32

4 = 12x

7 = 12x

unacademy

4×4×4 = 64

4×3×2 = 24

Rv

Rx

2 ÷4 → N ⇒ Last 2 Digits.

Rv 4 / 1-4 — —

12 | 44 (ones)

24

32

4×4 = 16

Rx 2 / 1-4 — —

12 | 44

24

32

4×4×2 = 32

3 cases

Toc

312

412

124

324

132

432

| | |
|---|---|
| 1 | 12 |
| 2 | 24 |
| 3 | 32 |
| 4 | 44 |

unacademy

# TEST

(1) 1 | 2 | 3 | 4 | 5

4-DIGIT No.s.

R✓ _ _ _ _

R< _ _ _ _

(2) $\frac{P}{0}$ 4.

R✓ _ _ _ _

R< _ _ _ _

unacademy

TEST

(1) 1 | 2 | 3 | 4 | 5

(2) 1 2 3 4

4-DIGIT NOS.

R✓ _ _ _ _

R✓ _ _ _ _

R✓ _ _ _ _

R✓ _ _ _ _

Ans. R✓ 4 DIGITS NOS.

5 × 5 × 5 × 5

1-5 1-5 1-5 1-5

625

R✓ 120

5 × 4 × 3 × 2

1-5 1-5 1-5 1-5

The The The The

unacademy

Q4.

1 | 2 | 3 | 4 | 5

R

× 5 cases

5 × 5

1-5 1-5

12 | 44
24 | 52
32

125

RC

4 cases

3 × 2

1-5 1-5

4 | 7-4 = 2α

4 | 1α

Thα

12
24
32

44
52

24

unacademy

$$\frac{2}{4}$$

T

4

Y

H

| | |
|---|---|
| 1 | 2 |
| 3 | 2 |
| 0 | 2 |
| 2 | 2 |
| 4 | 2 |

unacademy

1 - 9.

# TEST

$\frac{p}{2}$ 4

R

R

unacademy

64

25 cases

7 cases

04, 40

08, 80

20

60

00

Z

HZ

18 cases

| | | | |
|---|---|---|---|
| 12 | 32 | 52 | 76 |
| 16 | 36 | 56 | 84 |
| 24 | 44 | 64 | 88 |
| 28 | 48 | 68 | 92 |
| | | 72 | 96 |

unacademy

___ ___ ___ | ___ ___ |

÷4

25 − 07 = 18 cases

R^

9 9 9 | ___ ___ |

1-9 1-9 1-9

$9^3 \times 18$ =

18 cases

Rumi academy

2α

7 6 5 — 16

1-9 1-9 1-9

$\boxed{7 \times 6 \times 5 \times 16}$

$\frac{r}{n}$ 4

Decrease - 7

∴ 16 cases

$\frac{-2}{16}$ (44 | BB)

unacademy

0 | 1 | 2 | 3 | 4 | 5

TEST 9 cells = 45

C Ball

5

0 x

1 - 5

Z → 04, 40 | 90 | 50 — 4

$\sqrt{-12}$ → 12, 24 | 32, 44 | 52 — 5

unacademy

0-5

4 ⇒

Rα

X

3 leads

04/40

20

4

1-5

4/1 α

12

1-5

4-N2α

1-N2 <

N2=

12

24

3.

32

24

52

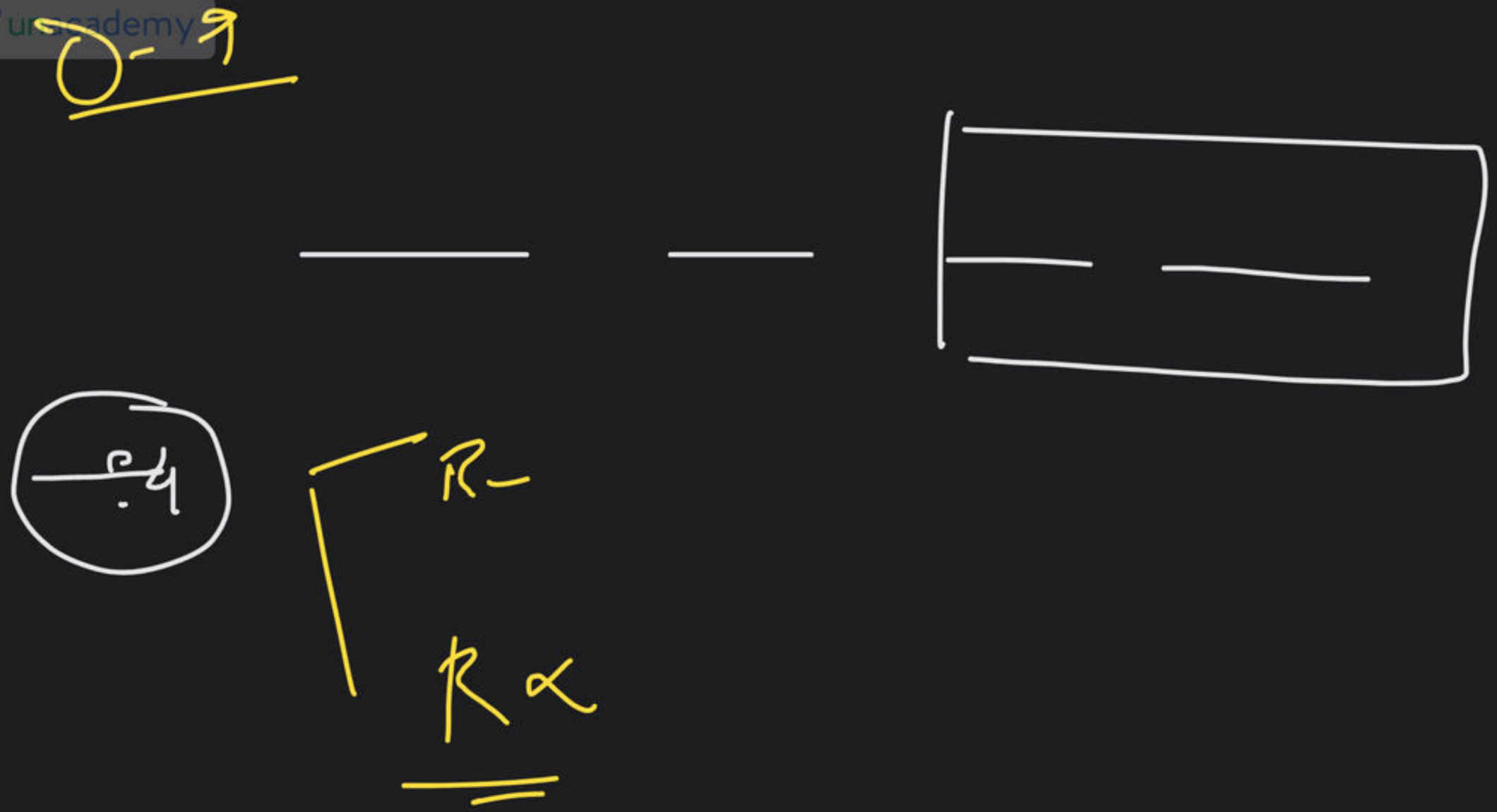
4 leads

12

+12

24

unacademy



$\frac{r}{2}$ 4

unacademy

$2^1 \Rightarrow 2$

$5^1 = 5^1 \Rightarrow$

$2^2 \Rightarrow 4$

$5^2 = 25^1 \Rightarrow$

$2^3 \Rightarrow 8$

$5^3 = 125^1 \Rightarrow$

$2^4 \Rightarrow 16$

$5^4 = 625^1$

unacademy

0 | 1 | 2 | 3 | 4 | 5

3 · 2 ways

00
25
50
75

5

0x

1-5

00 | 25
50

$\Rightarrow 5 \times 3 = 15$

0 | 1 | 2 | 3 | 4 | 5

6D
25
5D
~~7~~

R

5

3 · case

⇒ 5×3 = 15

0K

1-5

6D | 25 5D

4 + 3 = 7

R

25
5D
~~7~~

Z: 1 case

4.

1-5

5D

X | Z

1 case

3

1-5

25

unacademy

Q - 9.

# TEST.

$\boxed{\frac{n}{2} \text{ Lis}}$

$R^{\sim}$ $R^{<}$

unacademy

# TEST.

0–9

÷ 25

R✓

R✗

① R✓

4 cases

9 × 10 × ___ = 360

0✗

0–9

1–9

00 25

50 75

00 25 50 75

0-9

TEST.

÷ Rs

RC

RC

RC

÷ Rs

25

50

154

57

56

NTA

98

8 × 7 × scale

1.9,0 α

0-9

50

÷ × ÷ × α calls

0×

4/7 α

0-9

×α

25 | 75

unacademy

Test

H T > 4

6 × 6 × > 0

0 2

2 | 4 | 5 - | 7 | 8 | 9

6 5 > 2

0 | 2 | 4 | 5 | 7 | 8 | 9

6 4 > 4

⋮

6 9 > 8

2 | 4 | 5 - | 7 | 8 | 9

unacademy

$$6\left[6+5+4+3+2+1\right]$$

$$\frac{1}{2}\cdot n(n+1)$$

$$6\cdot\frac{1}{\cancel{2}}\cdot\cancel{6}^{3}\cdot 7$$

$$21\times 6$$

$$126$$

UNACADEMY
PLUS CLASS
COMPLETE
COURSE ON
GENERAL APTITUDE FOR
GATE 2024 / 25
USE CODE ST26
BY SAURABH SIR
unacademy

unacademy
32M+
WATCH MINUTE
12+
YEARS TEACHING EXPERIENCE
SUBSCRIPTION
CODE : ST26
SAURABH THAKUR
IIM ROHTAK
unacademy

# GATE 2019 - 01

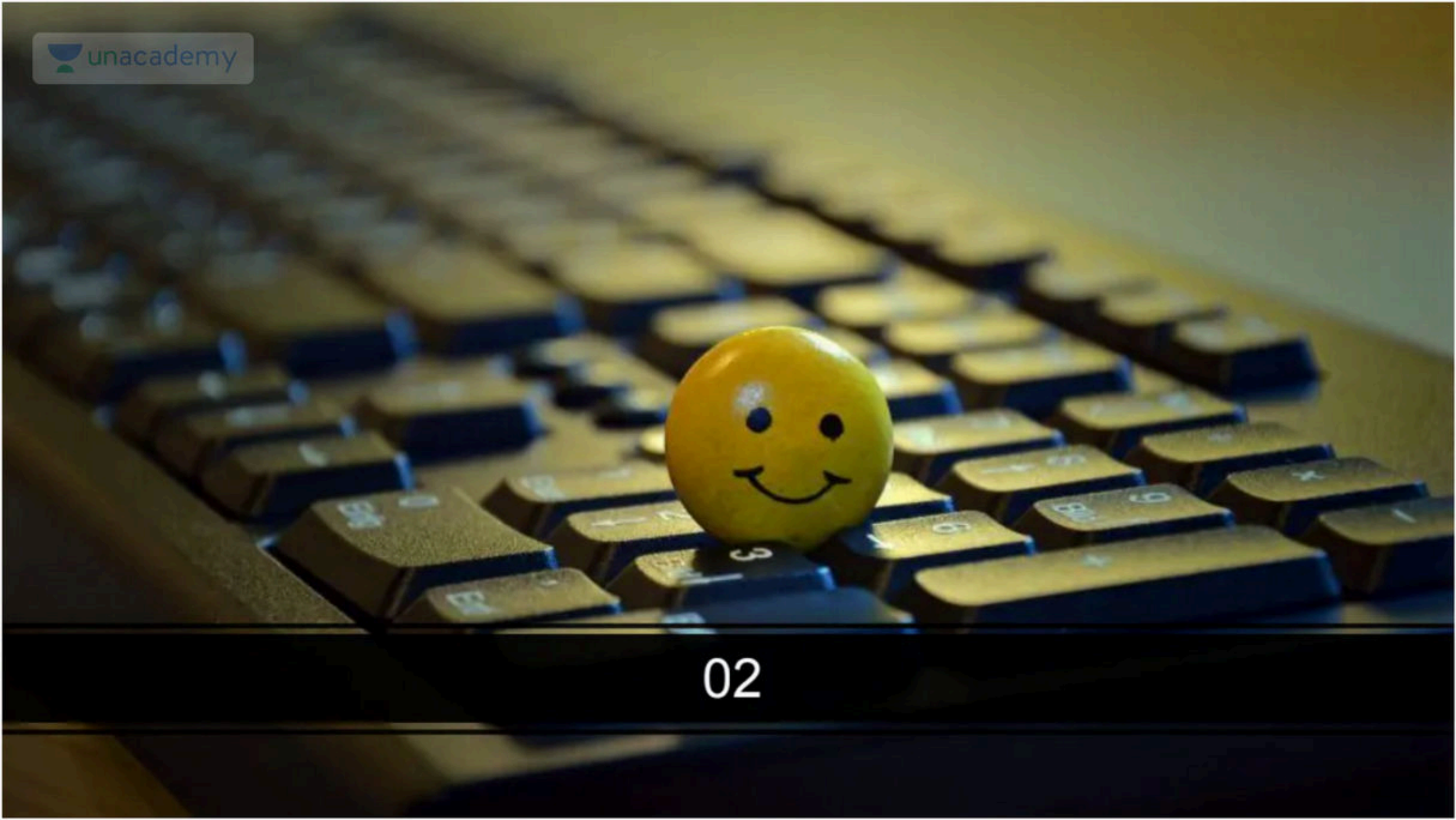
unacademy
01

unacademy

They have come a long way in _____ trust among the users.

(A) created
(B) creating
(C) creation
(D) create

IIT, Madras GATE 2019



02

unacademy

The CEO's decision to quit was as shocking to the Board as it was to_____.

(A) myself
(B) me
(C) I
(D) my

IIT, Madras GATE 2019

unacademy
03

unacademy

Countable

50

3

The few = few = -ve

few : +ve | some

The lecture was attended by quite _____ students, so the hall was not very_____.

(A) few, quite
(B) a few, quite
(C) few, quiet
(D) a few, quiet

IIT, Madras GATE 2019

unacademy
04

unacademy

5 10 15 20

If E = 10; J = 20; 0 = 30; and T = 40, what will be P + E + S + T ?

(A) 82
(B) 164
(C) 120
(D) 51

$(16+5+19+20) \times 2$

IIT, Madras GATE 2019

unacademy
05

On a horizontal ground, the base of straight ladder is 6m away from the base of a vertical pole. The ladder makes an angle of 45° to the horizontal. If the ladder is resting at a point located at one- fifth of the height of the pole from the bottom, the height of the pole is ____ meter.

**IIT, Madras GATE 2019**

unacademy
06

R Q, R, S and T are related and belong to the same family. P is the brother of S. Q is the wife of P. R and T are the children of the siblings P and S respectively. Which one of the following statements is necessarily FALSE?

(A) S is the sister-in-law of Q
(B) S is the aunt of T
(C) S is the aunt of R
(D) S is the brother of P

**IIT, Madras GATE 2019**

unacademy
07

A square has sides 5cm smaller than the sides of a second square. The area of the larger square is four times the area of the smaller square. The side of the larger square is _____ cm.

(A) 15.10
(B) 18.50
(C) 10.00
(D) 8.50

**IIT, Madras GATE 2019**

unacademy
08

In a sports academy of 300 people, 105 play only cricket, 70 play only hockey, 50 play only football, 25 play both cricket and hockey, 15 play both hockey and football and 30 play both cricket and football. The rest of them play all three sports. What is percentage of people who play at least two sports?

(A) 23.30
(B) 50.00
(C) 28.00
(D) 25.00

**IIT, Madras GATE 2019**

unacademy
09

unacademy

The increasing interest in tribal characters might be a mere coincidence, but the timing is of interest. None of this, though, is to say that the tribal hero has arrived in Hindi cinema, or that the new crop of characters represents the acceptance of the tribal character in the industry. The films and characters are too few to be described as a pattern.
Who does the word 'arrived' mean in the paragraph above?

(A) reached a terminus
(B) came to a conclusion
(C) attained a status
(D) went to a place

**IIT, Madras GATE 2019**

unacademy
10

unacademy

The new cotton technology, Bollgard-II, with herbicide tolerant traits has developed into a thriving business in India. However, the commercial use of this technology is not legal in India.
Notwithstanding that, reports indicate that the herbicide tolerant Bt cotton had been purchased by farmers at an average of Rs 200 more than the control price of ordinary cotton, and planted in 15% of the cotton growing area in the 2017 Kharif season.
Which one of the following statements can be inferred from the given passage?

(A) Farmers want to access the new technology for experimental purposes
(B) Farmers want to access the new technology if India benefits from it
(C) Farmers want to access the new technology by paying high price
(D) Farmers want to access the new technology even if it is not legal

**IIT, Madras GATE 2019**

# GATE 2019 - 02

unacademy
01

Daytime temperature in Delhi can____ 40°C

(A) Peak
(B) reach
(C) get
(D) stand

IIT, Madras GATE 2019

02

unacademy

The growth rate of ABC Motors in 2017 was the same _____ XYZ Motors in 2016 .

(A) As those of
(B) As that off
(C) As that of
(D) As off

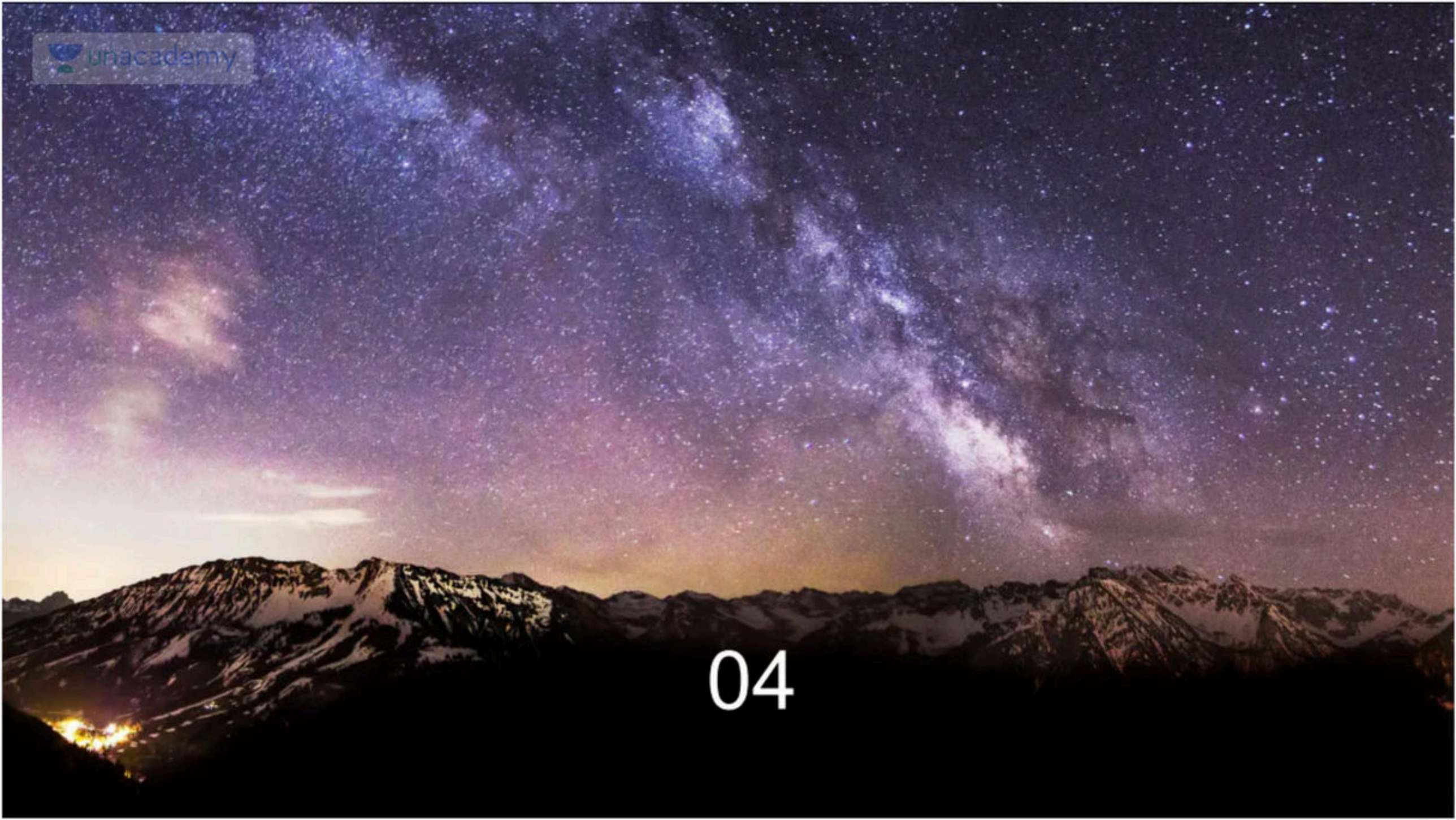
IIT, Madras GATE 2019

unacademy
03

Suresh wanted to lay a new carpet in his new mansion with an area of 70×55 sq. mts. However an area of 550 sq. mts had to be left out for flower pots. If the cost of carpet is Rs. 50 per sq. mts, how much money (in Rs.) will be spent by Suresh for the carpet now?

(A) Rs. 1,65,000
(B) Rs. 1,92,500
(C) Rs. 1,27,500
(D) Rs. 2,75,000

**IIT, Madras GATE 2019**


unacademy
04

A retaining wall with measurements 30 m × 12 m × 6 m was constructed with bricks of dimensions 8 cm × 6 cm × 6 cm. If 60% of the wall consists of bricks, total no of bricks used for the construction is _____ lakhs.

(A) 45
(B) 30
(C) 40
(D) 75

IIT, Madras GATE 2019

unacademy
05

unacademy

Hima Das was _____ only Indian athlete to win _____ gold for India.

(A) the, many
(B) an, the
(C) an, a
(D) the, a

IIT, Madras GATE 2019

unacademy
06

Population of state X increased by x% and the population of state Y increased by y% from 2001 to 2011. Assume that x is greater than y. Let P be the ratio of the population of state X to state Y in a given year. The percentage increase in P from 2001 to 2011 is_____

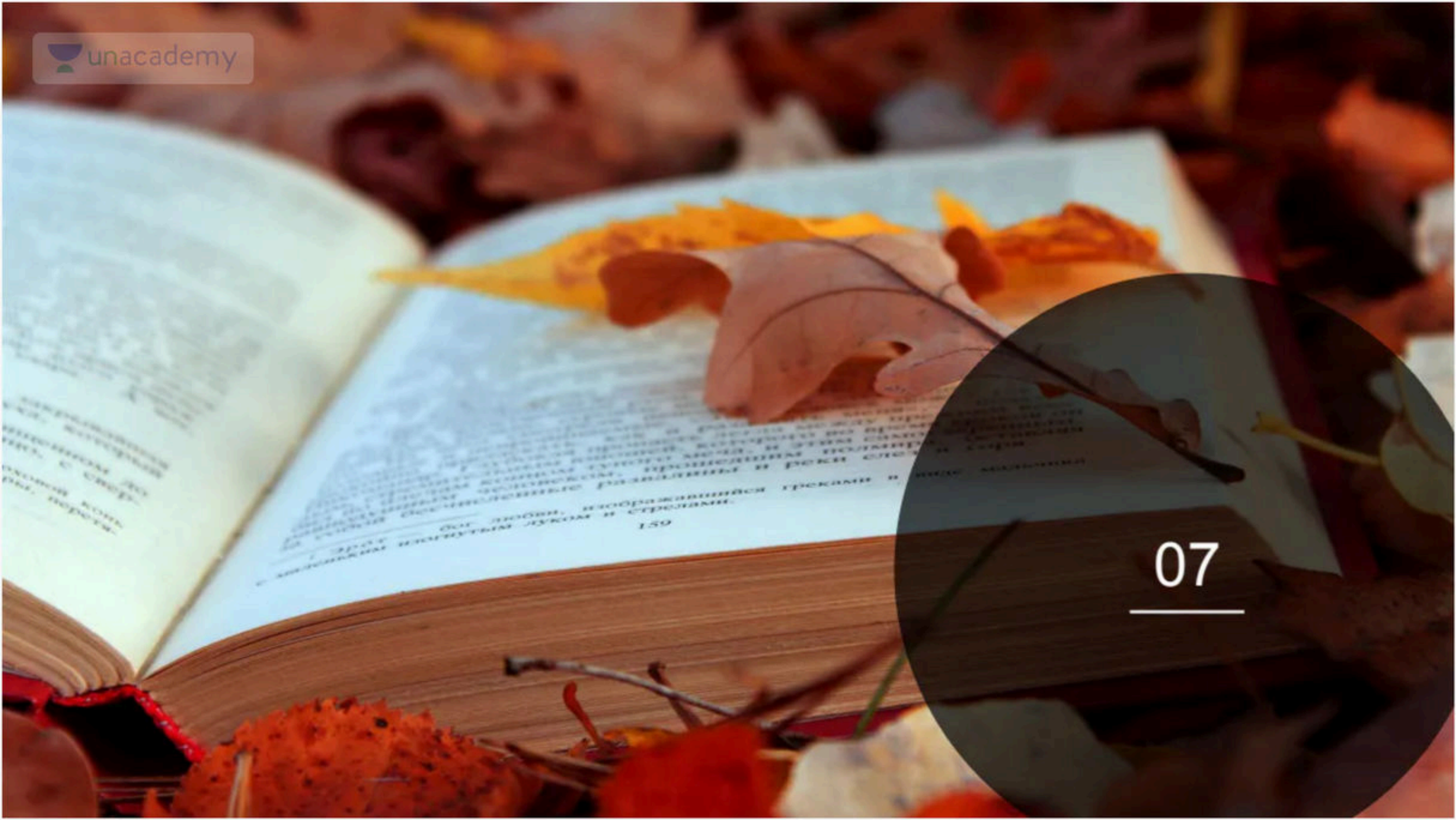
(A) $x - y$

(B) $\frac{100(x-y)}{100+x}$

(C) $\frac{100(x-y)}{100+y}$

(D) $\frac{x}{y}$

**IIT, Madras GATE 2019**


unacademy
07

unacademy

The Newspaper report that over 500 hectares of tribal land spread across 28 tribal settlements in Mohinitampuram forest division have already been "alienated'. A top forest official said, "First the tribals are duped out of their land holdings. Second, the families thus rendered landless are often forced to encroach further into the forests".
On the basis of the information available in the paragraph,_____is/are responsible for duping the tribals.

(A) The newspaper
(B) Landless families
(C) forest officials
(D) it cannot be inferred who

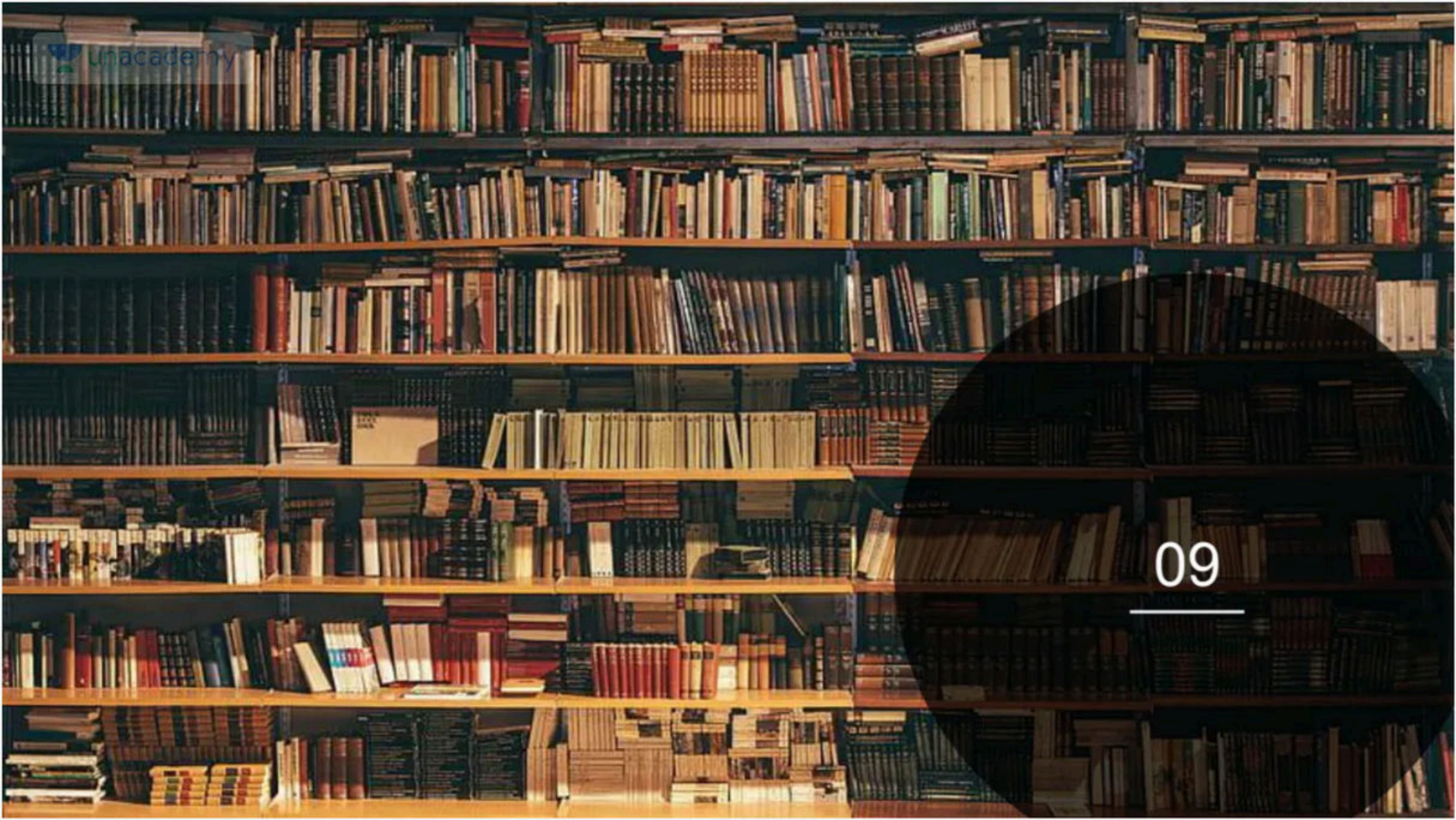
**IIT, Madras GATE 2019**

unacademy
08

An oil tank can be filled by pipe X in 5 hours and pipe Y in 4 hours, each pump working on its own. When the oil tank is full and the drainage hole is open, the oil is drained in 20 hours. If initially the tank was empty and someone started the two pumps together but left the drainage hole open, how many hours will it tak for the tank to be filled? (Assume that the rate of drainage is independent of the head)

(A) 2.50
(B) 1-50
(C) 2.00
(D) 4.00

**IIT, Madras GATE 2019**


09

Mohan, the manager, wants his four workers to work in pairs. No paper should work for more than 5 hours. Ram and John have worked together for 5 hours. Krishna and Amir have worked as a team for 2 hours. Krishna does not want to work with Ram. Whom should Mohan allot to work with John if he wants all the workers to continue working?

(A) Amir
(B) Krishna
(C) Ram
(D) None of the three

**IIT, Madras GATE 2019**

unacademy
10

unacademy

"Popular Hindi fiction, despite - or perhaps because of - its wide reach, often does not appear in our cinema. As ideals that viewers are meant to look up to rather than identify with, Hindi film protagonisits usually read books of apsirational value: textbooks, English books, or high value literature".
Which one of the following CANNOT be inferred from the paragraph above?

(A) Textbooks, English books or high literature have apsirational value, but not popular Hindi fiction
(B) People do not look up to writers of textbooks, English book or high value literature
(C) Though popular hindi fiction was wide readh, it often does not appear in the movies
(D) Protagonists in Hindi movies, being ideals for viewers, read only books of aspirational value.

**IIT, Madras GATE 2019**

# GATE 2020 - 01

unacademy
01

It is a common criticism that most of the academicians live in their_____. So, they are not aware of the real-life challenges.

(A) Ivory towers
(B) Homes
(C) Glass palaces
(D) Big flats

**IIT, Delhi GATE 2020**

unacademy
02
hdwallpapersdesktop.com

His hunger for reading is insatiable. He reads indiscriminately. He is most certainly a/an _____ reader.

(A) all-round
(B) voracious
(C) wise
(D) precocious

**IIT, Delhi GATE 2020**

unacademy
03

Select the word that fits the analogy Fuse : Fusion :: Use : ……

(A) User
(B) Uses
(C) Usage
(D) Usion

IIT, Delhi GATE 2020

unacademy
04

unacademy

XS

Y — 25

U — 21

V — 24

R — 18

A — 1

J — 10

97×5

485

AJIT

₹

If 0,1, 2, .....7, 8, 9 are coded as 0, P, Q, ..... V, W, X, then 45 will be coded as

(A) TS
(B) SS
(C) ST
(D) SU

IIT, Delhi GATE 2020

unacademy
05

The sum of two positive numbers is 100. After subtracting 5 from each number, the product of the resulting numbers is 0. One of the original numbers is.

(A) 95
(B) 85
(C) 80
(D) 90

IIT, Delhi GATE 2020

unacademy
06

unacademy

The American psychologist Howard Gardner expounds that human intelligence can be sub categorised into multiple kinds, in such a way that individuals differ with respect to their relative competence in each kind. Based on this theory, modern educationists insist on prescribing multi-dimensional curriculum and evaluation parameters that enable development and assessment of multiple intelligences.
Which of the following statements can be inferred from the given text?

(A) Howard Gardner insists that the teaching curriculum and evaluation needs to be multi-dimensional.
(B) Modern educationists want to develop and assess the theory of multiple intelligences.
(C) Modem educationists insist that the teaching curriculum and evaluation needs to be multi-dimensional.
(D) Howard Gardner wants to develop and assess the theory of multiple intelligences.

**IIT, Delhi GATE 2020**

unacademy
07

Five friends P, Q, R, S and T went camping. At night, they had to sleep in a row inside the tent. P, Q and T refused to sleep next to R since he snored loudly. P and S wanted to avoid Q as he usually hugged people in sleep.
Assuming everyone was satisfied with the sleeping arrangements, what is the order in which they slept?

(A) RSPTQ
(B) SPRTQ
(C) QTSPR
(D) QRSPT

**IIT, Delhi GATE 2020**

unacademy
08

Insert seven numbers between 2 and 34, such that the resulting sequence including 2 and 34 is an arithmetic progression. The sum of these inserted seven numbers is.

(A) 124
(B) 130
(C) 120
(D) 126

**IIT, Delhi GATE 2020**

unacademy
09

The unit's place in $26591749^{110016}$ is

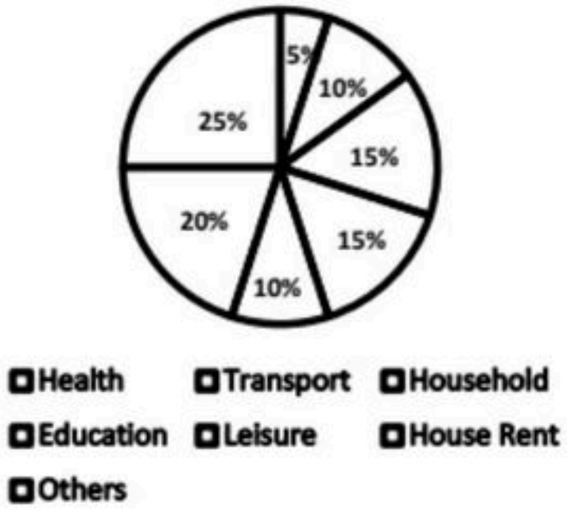
(A) 6
(B) 1
(C) 3
(D) 9

IIT, Delhi GATE 2020

unacademy
10

The total expenditure of a family, on different activities in a month, is shown in the pie-chart. The extra money spent on education as compared to transport (in percent) is

(A) 50
(B) 100
(C) 33.3
(D) 55




IIT, Delhi GATE 2020

# GATE 2020 - 02

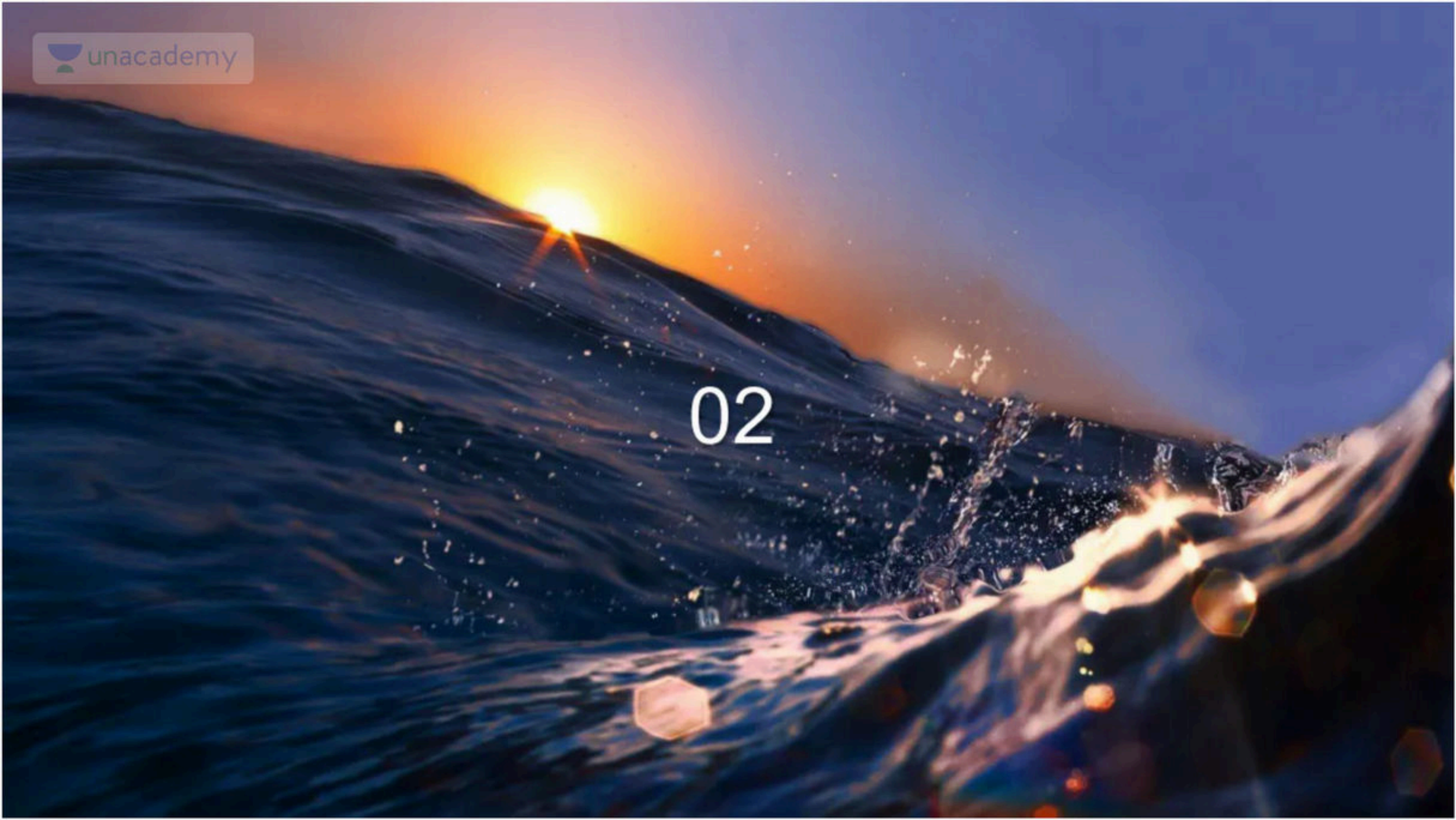
unacademy
01

unacademy

Rescue teams deployed ____ disaster hit areas combat ____ a lot of difficulties to save the people.

(A) with, with
(B) in, with
(C) with, at
(D) to, to

IIT, Delhi GATE 2020


unacademy
02

unacademy

Select the most appropriate word that can replace the underlined word without changing the meaning of the sentence: Now-a-days, most children have a tendency to <u>belittle</u> the legitimate concerns of their parents.

(A) Disparage
(B) Begrudge
(C) Reduce
(D) Applaud

**IIT, Delhi GATE 2020**

unacademy
03

Select the word that fits the analogy : Partial : Impartial :: Popular : _____

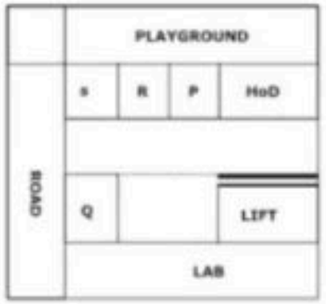
(A) Dispopular
(B) Impopular
(C) Unpopular
(D) Mispopular

**IIT, Delhi GATE 2020**

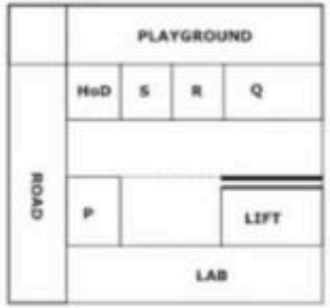
unacademy
Success
Business
Innovation
Branding
Solution
Marketing
Analysis
Ideas
Success
Management
Solution

# 04

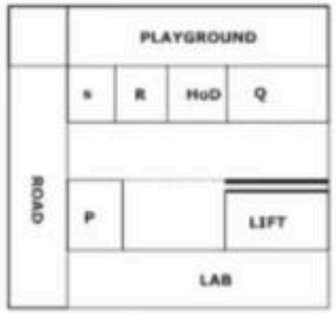
After the inauguration of the new building, the Head of the Department (HoD) collated faculty preferences for office space. P wanted a room adjacent to the lab. Q wanted to be close to the lift. R wanted a view of the playground and S wanted a corner office. Assuming the everyone was satisfied, which among the following shows a possible allocation?



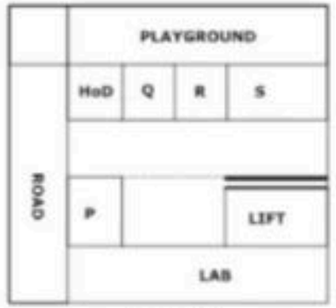

(A)




(B)

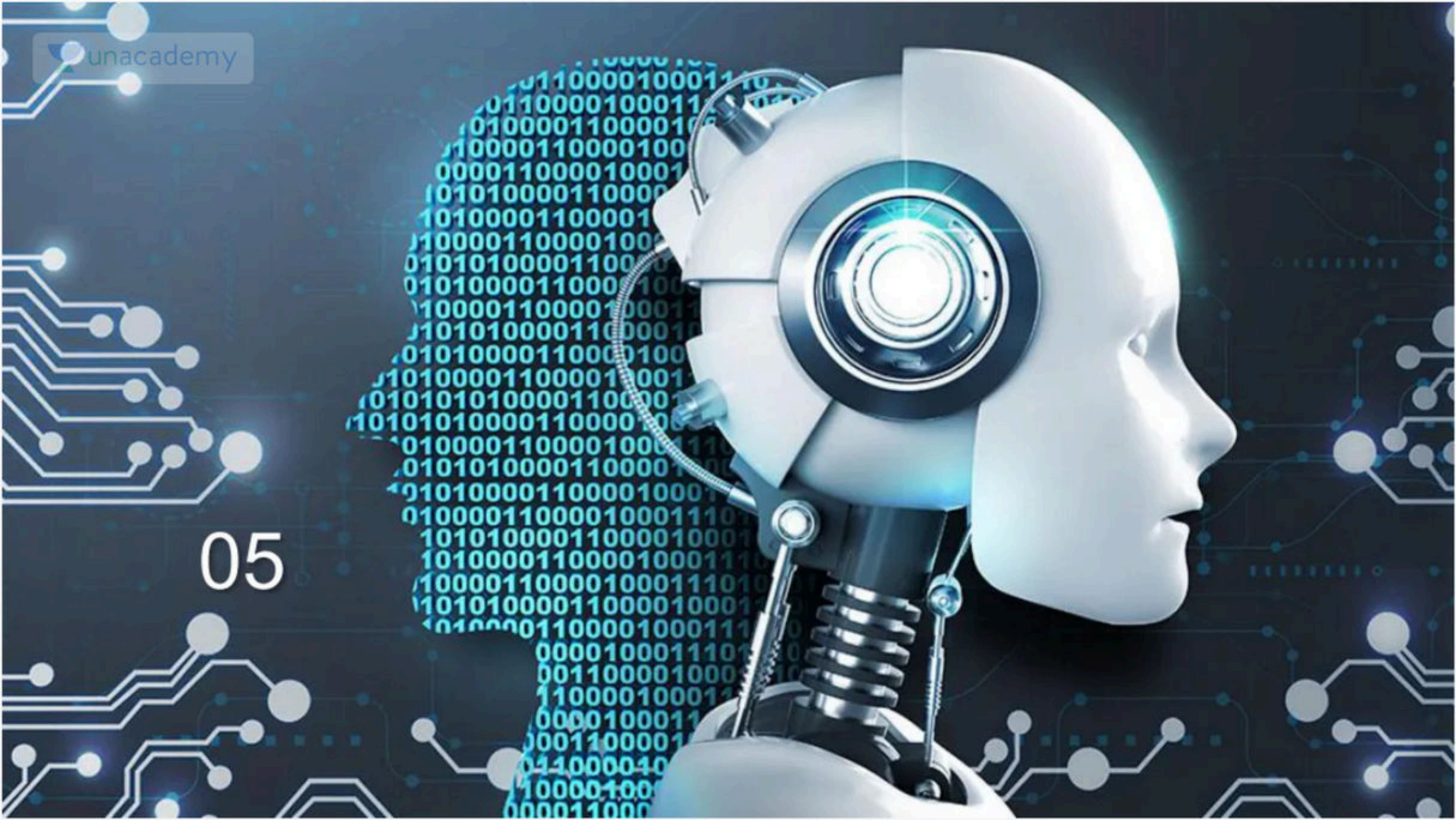



(C)




(D)

**IIT, Delhi GATE 2020**


unacademy
05

If $f(x) = x^2$ for each $x \in (-\infty, \infty)$, then $\frac{f(f(f(x)))}{f(x)}$ is equal to ____.

(A) $(f(x))^4$
(B) $(f(x))^2$
(C) $(f(x))^3$
(D) $f(x)$

IIT, Delhi GATE 2020

unacademy
06

Nominal interest rate is defined as the amount paid by the borrower to the lender for using the borrowed amount for a specific period of time. Real interest rate calculated on the basis of actual value (inflation-adjusted), is approximately equal to the difference between nominal rate and expected rate of inflation in the economy.
Which of the following assertions is best supported by the above information?

(A) Under low inflation, real interest rate is low and borrowers get benefited.
(B) Under high inflation, real interest rate is low and lenders get benefited.
(C) Under high inflation, real interest rate is low and borrowers get benefited.
(D) Under low inflation, real interest rate is high and borrowers get benefited.

**IIT, Delhi GATE 2020**

unacademy
07

For the year 2019, which of the previous year's calendar can be used?

(A) 2013
(B) 2014
(C) 2012
(D) 2011

**IIT, Delhi GATE 2020**

unacademy
08

unacademy

The ratio of 'the sum of the odd positive integers from 1 to 100' to ‘the sum of the even positive integers from 150 to 200’ is_____

(A) 45 : 95
(B) 1 : 2
(C) 50 : 91
(D) 1 :1

IIT, Delhi GATE 2020

09

In a school of 1000 students, 300 students play chess and 600 students play football. If 50 students play both chess and football, the number of students who play neither is____.

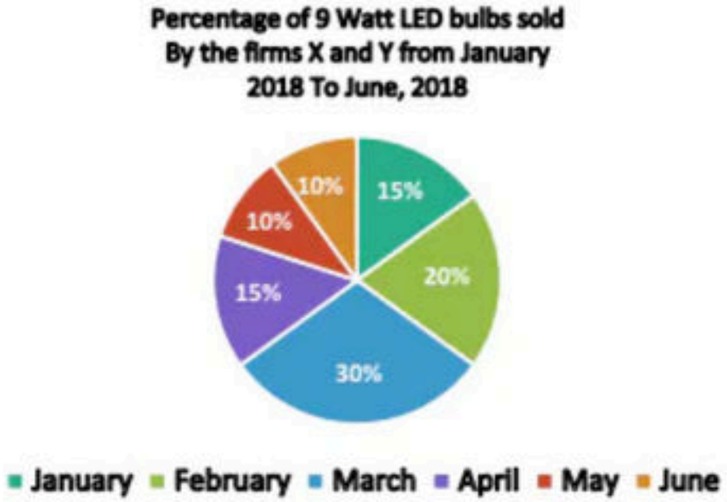
(A) 150
(B) 200
(C) 100
(D) 50

IIT, Delhi GATE 2020

unacademy
10

The monthly distribution of 9 Watt LED bulbs sold by two firms X and Y from January to June 2018 is shown in the piechart and the corresponding table. If the total number of LED bulbs sold by two firms during April-June 2018 is 50000, then the number of LED bulbs sold by the firm Y during April-June 2018 is____.

(A) 8750
(B) 8250
(C) 9750
(D) 11250




| Month | Ratio of LED bulbs sold by two firms (X : Y) |
|---|---|
| January | 7 : 8 |
| February | 2 : 3 |
| March | 2 : 1 |
| April | 3 : 2 |
| May | 1 : 4 |
| June | 9 : 11 |

IIT, Delhi GATE 2020

# GATE 2021 - 01

unacademy
01

unacademy

Getting to the top is _____ than staying on top.

(A) easier
(B) more easier
(C) easiest
(D) much easier

IIT, Bombay GATE 2021

unacademy

WINGS OF KNOWLEDGE'

02

$\oplus$ and $\odot$ are two operators on number p and q such that $p \oplus q = \frac{p^2+q^2}{pq}$ and $p \odot q = \frac{p^2}{q}$; If $x \oplus y = 2 \odot 2$, then x =

(A) y
(B) 3y/2
(C) 2y
(D) y/2

IIT, Bombay GATE 2021

unacademy

03

Consider two rectangular sheets, Sheet M and Sheet N of dimensions 6 cm x 4 cm each.
Folding operation 1: The sheet is folded into half by joining the short edges of the current shape.
Folding operation 2: The sheet is folded into half by joining the long edges of the current shape.
Folding operation 1 is carried out on Sheet M three times.
Folding operation 2 is carried out on Sheet N three times.
The ratio of perimeters of the final folded shape of Sheet N to the final folded shape of Sheet M is____.

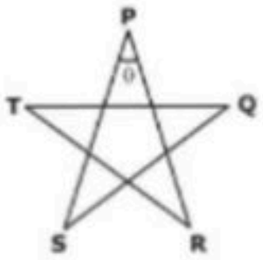
(A) 5 : 13 (B) 13 : 7
(C) 7 : 5 (B) 3 : 2

**IIT, Bombay GATE 2021**

unacademy
04

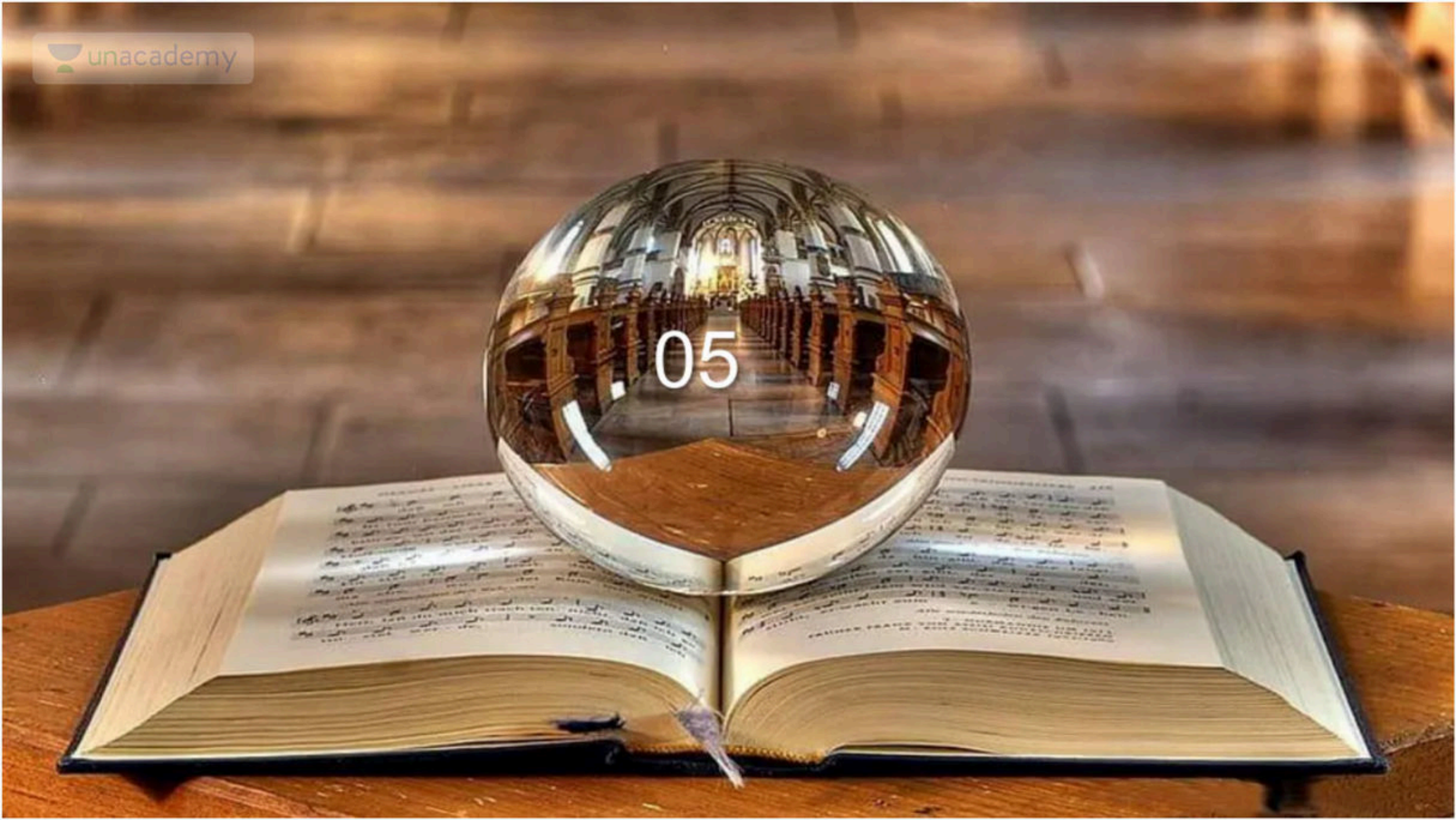
Five line segments of equal lengths, PR, PS, QS, QT and RT are used to form a star as shown in the figure above.
The value of $\theta$, in degrees, is

(A) 45
(B) 72
(C) 36
(D) 108




IIT, Bombay GATE 2021

unacademy



In a company, 35% of the employees drink coffee, 40% of the employees drink tea and 10% of the employees drink both tea and coffee. What % of employees drink neither tea nor coffee?

(A) 35
(B) 25
(C) 40
(D) 15

**IIT, Bombay GATE 2021**

unacademy
Atlantic
Ocean
06

A function, $\lambda$, is defined by $\lambda(p, q) = \begin{Bmatrix} (p-q)^2, \text{if } p \geq q \\ p+q, \text{if } p < q \end{Bmatrix}$

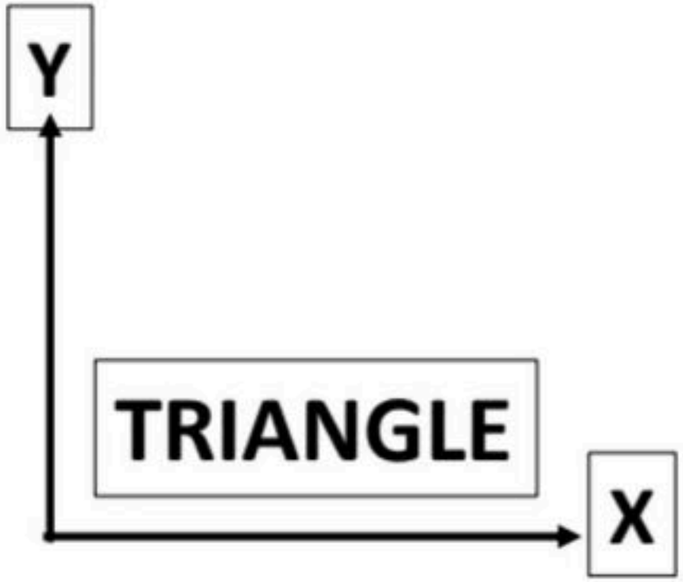
The value of the expression $\frac{\lambda(-(-3+2),(-2+3))}{(-(-2+1))}$ is:

(A) 16
(B) -1
(C) 16/3
(D) 0

IIT, Bombay GATE 2021

unacademy
07

unacademy




(A)

(B)

(C)

(D)

IIT, Bombay GATE 2021

unacademy
08

Statement: Either P marries Q or X marries Y.
Among the options below, the logical NEGATION of the above statement is:

(A) Neither P marries Q nor X marries Y.
(B) X does not marry Y and P marries Q.
(C) P marries Q and X marries Y.
(D) P does not marry Q and X marries Y.

**IIT, Bombay GATE 2021**

unacademy
09

unacademy

Four persons R Q, R and S are to be seated in a row, all facing the same direction, but not necessarily in the same order. P and R cannot sit adjacent to each other. S should be seated to the right of Q. The number of distinct seating arrangements possible is:

(A) 6
(B) 8
(C) 4
(D) 2

**IIT, Bombay GATE 2021**

unacademy
23.328
75.32
19.75
19.352
37.5
2.785
12.45
45.50
2.30
10

unacademy

Humans have the ability to construct worlds entirely in their minds, which don't exist in the physical world. So far as we know, no other species possesses this ability. This skill is so important that we have different words to refer to its different flavors, such as imagination, invention, and innovation.
Based on the above passage, which one of the following 1 s TRUE?

(A) We do not know of any species other than humans who possess the ability to construct mental worlds.
(B) Imagination, invention, and innovation are unrelated to the ability to construct mental worlds.
(C) The terms imagination, invention and innovation refer to unrelated skills.
(D) No species possess the ability to construct worlds in their minds.

**IIT, Bombay GATE 2021**

# GATE 2021 - 02

unacademy
TRAINING
BUSINESS VALUE
?
EMPLOYEE
SUCCESS
EMPLOYEE RECRUITMENT
STRATEGIC OBJECTIVES
REWARDING
01

(i) Arun and Aparna are here
(ii) Arun and Aparna is here
(iii) Aruns families is here
(iv) Aruns family is here
Which of the above sentences are grammatically CORRECT?

(A) (iii) and (iv)
(B) (ii) and (iv)
(C) (i) and (ii)
(D) (i) and (iv)

**IIT, Bombay GATE 2021**

unacademy
02

$\oplus$ and $\odot$ are two operators on numbers p and q such that $p \odot q = p - q$, and $p \oplus q = p \times q$

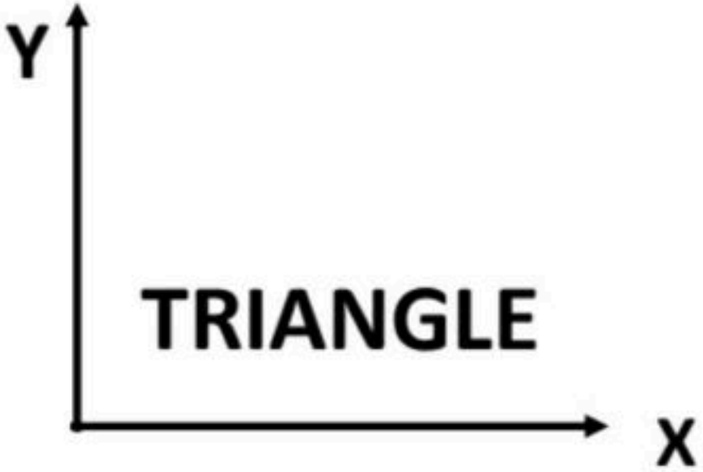
Then, $(9 \odot (6 \oplus 7)) \odot (7 \oplus (6 \odot 5)) =$

(A) 40
(B) -40
(C) -26
(D) -33

**IIT, Bombay GATE 2021**

unacademy
03

unacademy

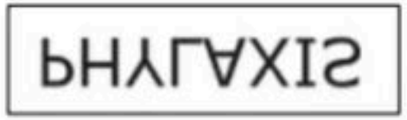



The mirror image of the above text about the X-axis is

(A)

(B)

(C)

(D) 

IIT, Bombay GATE 2021

unacademy
04

In an equilateral triangle PQR, side PQ is divided into four equal parts, side QR is divided into six equal parts and side PR is divided into eight equal parts. The length of each subdivided part in cm is an integer.
The minimum area of the triangle PQR possible, in $cm^2$, is

(A) 24
(B) 18
(C) $144\sqrt{3}$
(D) $48\sqrt{3}$

**IIT, Bombay GATE 2021**

unacademy

05

Two identical cube shaped dice each with faces numbered 1 to 6 are rolled simultaneously. The probability that an even number is rolled out on each dice is :

(A) $\frac{1}{36}$

(B) $\frac{1}{12}$

(C) $\frac{1}{4}$

(D) $\frac{1}{8}$

IIT, Bombay GATE 2021

unacademy
06

unacademy

The author said, "Musicians rehearse before their concerts. Actors rehearse their roles before the opening of a new play. On the other hand, I find it strange that many public speakers think they can just walk on to the stage and start speaking. In my opinion, it is no less important for public speakers to rehearse their talks."
Based on the above passage, which one of the following is TRUE?

(A) The author is of the opinion that rehearsing is important for musicians, actors and public speakers.
(B) The author is of the opinion that rehearsal is more important for actors than musicians.
(C) The author is of the opinion that rehearsing is more important only for musicians than public speakers.
(D) The author is of the opinion that rehearsing is less important for public speakers than for musicians and actors.

**IIT, Bombay GATE 2021**

unacademy
07

In the figure shown above, PQRS is a square. The shaded portion is formed by the intersection of sectors of circles with radius equal to the side of the square and centers at S and Q.

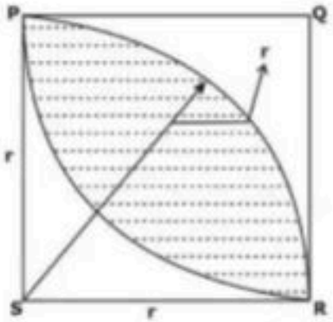
The probability that any point picked randomly within the square falls in the shaded area is_____..

(A) $4 - \frac{\pi}{2}$

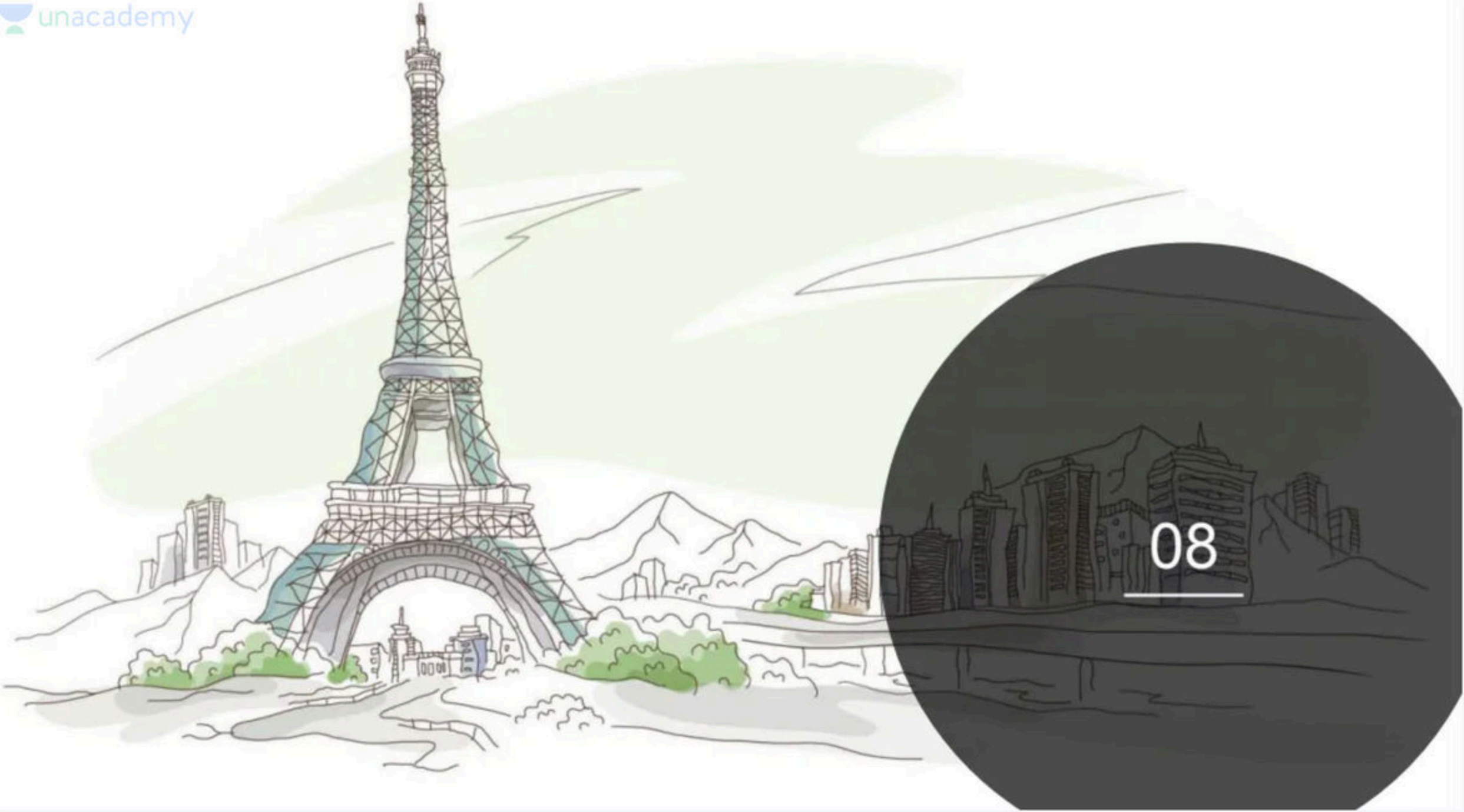
(B) $\frac{\pi}{2} - 1$

(C) $\frac{\pi}{4}$

(D) $\frac{1}{2}$




IIT, Bombay GATE 2021


08

Four persons F > Q, R and S are to be seated in a row. R should not be seated at the second position from the left end of the row. The number of distinct seating arrangements possible is:

(A) 6
(B) 18
(C) 24
(D) 9

**IIT, Bombay GATE 2021**

unacademy
09
Start at monthly
Can we do time?

On a planar field, you travelled 3 units East from a point 0. Next you travelled 4 units South to arrive at point P. Then you travelled from P in the North-East direction such that you arrive at a point that is 6 units East of point P. Next, you travelled in the North-West direction, so that you arrive at point Q that is 8 units North of point P.
The distance of point Q to point 0, in the same units, should be____ .

(A) 4
(B) 5
(C) 3
(D) 6

**IIT, Bombay GATE 2021**

unacademy
OFF
%
MU
10

1) Some football players play cricket.
2) All cricket players play hockey.
Among the options given below, the statement that logically follows from the two statements 1 and 2 above, is :

(A) All hockey players play football.
(B) All football players play hockey.
(C) Some football players play hockey.
(D) No football player plays hockey.

**IIT, Bombay GATE 2021**

# GATE 2022 (ME Set-1) Mechanical Engineering

unacademy
01

unacademy

| | |
|---|---|
| Q. | After playing _____ hours of tennis, I am feeling _____ tired to walk back. |
| (A) | too / too |
| (B) | too / two |
| (C) | two / two |
| (D) | two / too |

IIT, Kharagpur GATE 2022

unacademy
02

| | |
|---|---|
| Q | The average of the monthly salaries of M, N and S is ₹ 4000. The average of the monthly salaries of N, S and P is ₹ 5000. The monthly salary of P is ₹ 6000.<br><br>What is the monthly salary of M as a percentage of the monthly salary of P? |
| (A) | 50% |
| (B) | 75% |
| (C) | 100% |
| (D) | 125% |

IIT, Kharagpur GATE 2022

unacademy
03

unacademy

| | |
|---|---|
| Q. | A person travelled 80 km in 6 hours. If the person travelled the first part with a uniform speed of 10 kmph and the remaining part with a uniform speed of 18 kmph.<br><br>What percentage of the total distance is travelled at a uniform speed of 10 kmph? |
| (A) | 28.25 |
| (B) | 37.25 |
| (C) | 43.75 |
| (D) | 50.00 |

IIT, Kharagpur GATE 2022

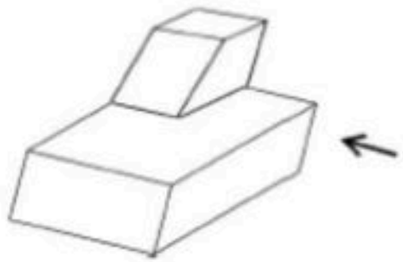
unacademy
04

| | |
|---|---|
| Q | Four girls P, Q, R and S are studying languages in a University. P is learning French and Dutch. Q is learning Chinese and Japanese. R is learning Spanish and French. S is learning Dutch and Japanese.<br><br>Given that: French is easier than Dutch; Chinese is harder than Japanese; Dutch is easier than Japanese, and Spanish is easier than French.<br><br>Based on the above information, which girl is learning the most difficult pair of languages? |
| (A) | P |
| (B) | Q |
| (C) | R |
| (D) | S |

IIT, Kharagpur GATE 2022

unacademy
05

Q.



A block with a trapezoidal cross-section is placed over a block with rectangular cross section as shown above.

Which one of the following is the correct drawing of the view of the 3D object as viewed in the direction indicated by an arrow in the above figure?

(A)

(B)

(C)

(D)

IIT, Kharagpur GATE 2022

unacademy
06

| | |
|---|---|
| Q. | Humans are naturally compassionate and honest. In a study using strategically placed wallets that appear "lost", it was found that wallets with money are more likely to be returned than wallets without money. Similarly, wallets that had a key and money are more likely to be returned than wallets with the same amount of money alone. This suggests that the primary reason for this behavior is compassion and empathy.<br><br>Which one of the following is the CORRECT logical inference based on the information in the above passage? |
| (A) | Wallets with a key are more likely to be returned because people do not care about money |
| (B) | Wallets with a key are more likely to be returned because people relate to suffering of others |
| (C) | Wallets used in experiments are more likely to be returned than wallets that are really lost |
| (D) | Money is always more important than keys |

IIT, Kharagpur GATE 2022

unacademy
07

| | |
|---|---|
| Q. | A rhombus is formed by joining the midpoints of the sides of a unit square.<br><br>What is the diameter of the largest circle that can be inscribed within the rhombus? |
| (A) | $\frac{1}{\sqrt{2}}$ |
| (B) | $\frac{1}{2\sqrt{2}}$ |
| (C) | $\sqrt{2}$ |
| (D) | $2\sqrt{2}$ |

IIT, Kharagpur GATE 2022

08

| | |
|---|---|
| Q. | An equilateral triangle, a square and a circle have equal areas.<br><br>What is the ratio of the perimeters of the equilateral triangle to square to circle? |
| (A) | $3\sqrt{3} : 2 : \sqrt{\pi}$ |
| (B) | $\sqrt{(3\sqrt{3})} : 2 : \sqrt{\pi}$ |
| (C) | $\sqrt{(3\sqrt{3})} : 4 : 2\sqrt{\pi}$ |
| (D) | $\sqrt{(3\sqrt{3})} : 2 : 2\sqrt{\pi}$ |

IIT, Kharagpur GATE 2022

unacademy
09

| | |
|---|---|
| Q | Given below are three conclusions drawn based on the following three statements.<br><br>Statement 1: All teachers are professors.<br><br>Statement 2: No professor is a male.<br><br>Statement 3: Some males are engineers.<br><br>Conclusion I: No engineer is a professor.<br><br>Conclusion II: Some engineers are professors.<br><br>Conclusion III: No male is a teacher.<br><br>Which one of the following options can be logically inferred? |
| (A) | Only conclusion III is correct |
| (B) | Only conclusion I and conclusion II are correct |
| (C) | Only conclusion II and conclusion III are correct |
| (D) | Only conclusion I and conclusion III are correct |

IIT, Kharagpur GATE 2022

unacademy
10

unacademy

| | |
|---|---|
| Q. | In a 12-hour clock that runs correctly, how many times do the second, minute, and hour hands of the clock coincide, in a 12-hour duration from 3 PM in a day to 3 AM the next day? |
| (A) | 11 |
| (B) | 12 |
| (C) | 144 |
| (D) | 2 |

IIT, Kharagpur GATE 2022

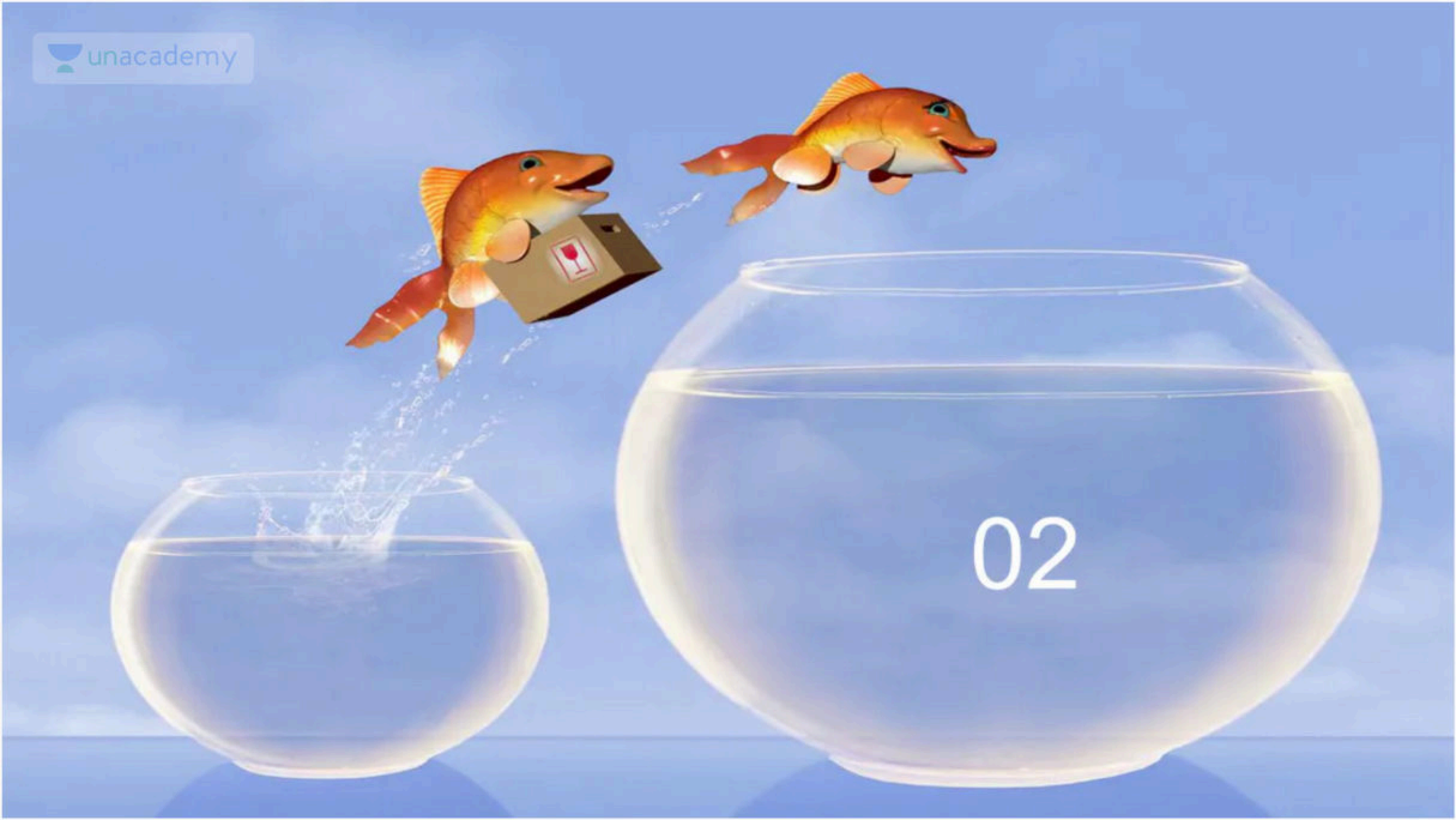
# GATE 2022 (ME Set-2) Mechanical Engineering

unacademy
SUCCESS
01

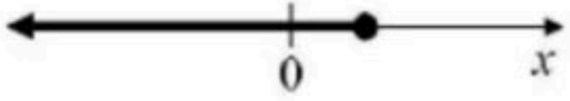
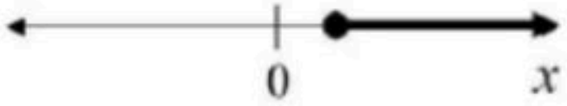
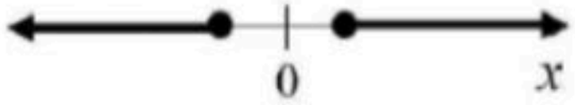
unacademy

| | |
|---|---|
| Q. | Writing too many things on the _____ while teaching could make the students get _____. |
| (A) | bored / board |
| (B) | board / bored |
| (C) | board / board |
| (D) | bored / bored |

IIT, Kharagpur GATE 2022


unacademy
02

unacademy

| | |
|---|---|
| Q. | Which one of the following is a representation (not to scale and in bold) of all values of $x$ satisfying the inequality $2 - 5x \leq -\frac{6x-5}{3}$ on the real number line? |
| (A) |  |
| (B) | |
| (C) |  |
| (D) |  |

IIT, Kharagpur GATE 2022

unacademy
03

| | |
|---|---|
| Q. | If $f(x) = 2\ln\left(\sqrt{e^x}\right)$, what is the area bounded by $f(x)$ for the interval $[0, 2]$ on the $x$-axis? |
| (A) | $\frac{1}{2}$ |
| (B) | 1 |
| (C) | 2 |
| (D) | 4 |

IIT, Kharagpur GATE 2022

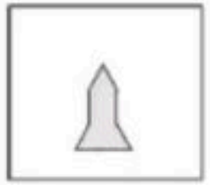
unacademy
04

| | |
|---|---|
| Q. | A person was born on the fifth Monday of February in a particular year.<br><br>Which one of the following statements is correct based on the above information? |
| (A) | The 2nd February of that year is a Tuesday |
| (B) | There will be five Sundays in the month of February in that year |
| (C) | The 1st February of that year is a Sunday |
| (D) | All Mondays of February in that year have even dates |

IIT, Kharagpur GATE 2022

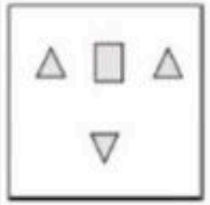
05

Q.

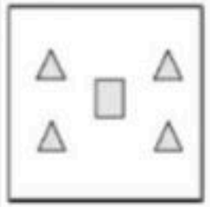


Which one of the groups given below can be assembled to get the shape that is shown above using each piece only once without overlapping with each other? (rotation and translation operations may be used).

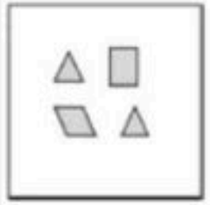
(A)



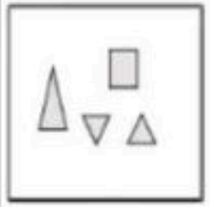
(B)



(C)



(D)



IIT, Kharagpur GATE 2022

unacademy
06

unacademy

| | |
|---|---|
| Q. | Fish belonging to species S in the deep sea have skins that are extremely black (ultra-black skin). This helps them not only to avoid predators but also sneakily attack their prey. However, having this extra layer of black pigment results in lower collagen on their skin, making their skin more fragile.<br><br>Which one of the following is the CORRECT logical inference based on the information in the above passage? |
| (A) | Having ultra-black skin is only advantageous to species S |
| (B) | Species S with lower collagen in their skin are at an advantage because it helps them avoid predators |
| (C) | Having ultra-black skin has both advantages and disadvantages to species S |
| (D) | Having ultra-black skin is only disadvantageous to species S but advantageous only to their predators |

IIT, Kharagpur GATE 2022

unacademy

07

| | |
|---|---|
| Q. | For the past $m$ days, the average daily production at a company was 100 units per day.<br><br>If today's production of 180 units changes the average to 110 units per day, what is the value of $m$? |
| (A) | 18 |
| (B) | 10 |
| (C) | 7 |
| (D) | 5 |

IIT, Kharagpur GATE 2022

unacademy
08

unacademy

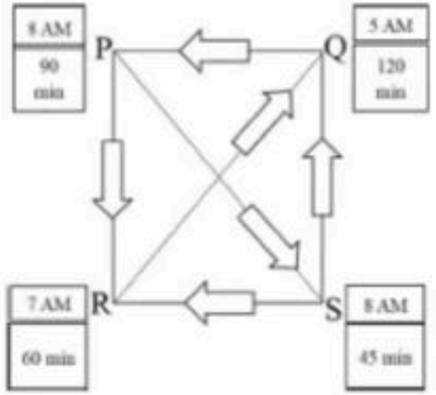
| | |
|---|---|
| Q. | Consider the following functions for non-zero positive integers, $p$ and $q$.<br>$f(p,q) = \underbrace{p \times p \times p \times \ldots\ldots\ldots \times p}_{q \text{ terms}} = p^q; \quad f(p,1) = p$<br>$g(p,q) = p^{p^{p^{p^{\cdot^{\cdot^{\cdot^{(\text{up to } q \text{ terms})}}}}}}} \quad ; \quad g(p,1) = p$<br>Which one of the following options is correct based on the above? |
| (A) | $f(2,2) = g(2,2)$ |
| (B) | $f(g(2,2),2) < f(2,g(2,2))$ |
| (C) | $g(2,1) \neq f(2,1)$ |
| (D) | $f(3,2) > g(3,2)$ |

IIT, Kharagpur GATE 2022

unacademy
09

Q. Four cities P, Q, R and S are connected through one-way routes as shown in the figure. The travel time between any two connected cities is one hour. The boxes beside each city name describe the starting time of first train of the day and their frequency of operation. For example, from city P, the first trains of the day start at 8 AM with a frequency of 90 minutes to each of R and S. A person does not spend additional time at any city other than the waiting time for the next connecting train.

If the person starts from R at 7 AM and is required to visit S and return to R, what is the minimum time required?

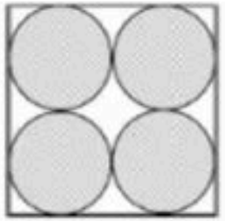
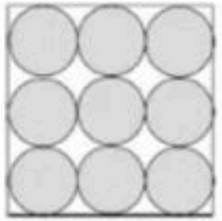



| | |
|---|---|
| (A) | 6 hours 30 minutes |
| (B) | 3 hours 45 minutes |
| (C) | 4 hours 30 minutes |
| (D) | 5 hours 15 minutes |

IIT, Kharagpur GATE 2022

unacademy
10

unacademy

| | |
|---|---|
| Q. | Equal sized circular regions are shaded in a square sheet of paper of 1 cm side length. Two cases, case M and case N, are considered as shown in the figures below. In the case M, four circles are shaded in the square sheet and in the case N, nine circles are shaded in the square sheet as shown.<br><br>What is the ratio of the areas of unshaded regions of case M to that of case N?<br><br>  <br>case M<br>  <br>case N |
| (A) | 2 : 3 |
| (B) | 1 : 1 |
| (C) | 3 : 2 |
| (D) | 2 : 1 |

IIT, Kharagpur GATE 2022

# GATE 2022 (CE Set - 01) Civil Engineering

unacademy
01

unacademy

The movie was funny and I.....

A could help laughing

B couldn't help laughed

C couldn't help laughing

D could helped laughed

IIT, Kharagpur GATE 2022

unacademy
02

unacademy

$x : y : z = \frac{1}{2} : \frac{1}{3} : \frac{1}{4}$

What is the value of $\frac{x + z - y}{y}$?

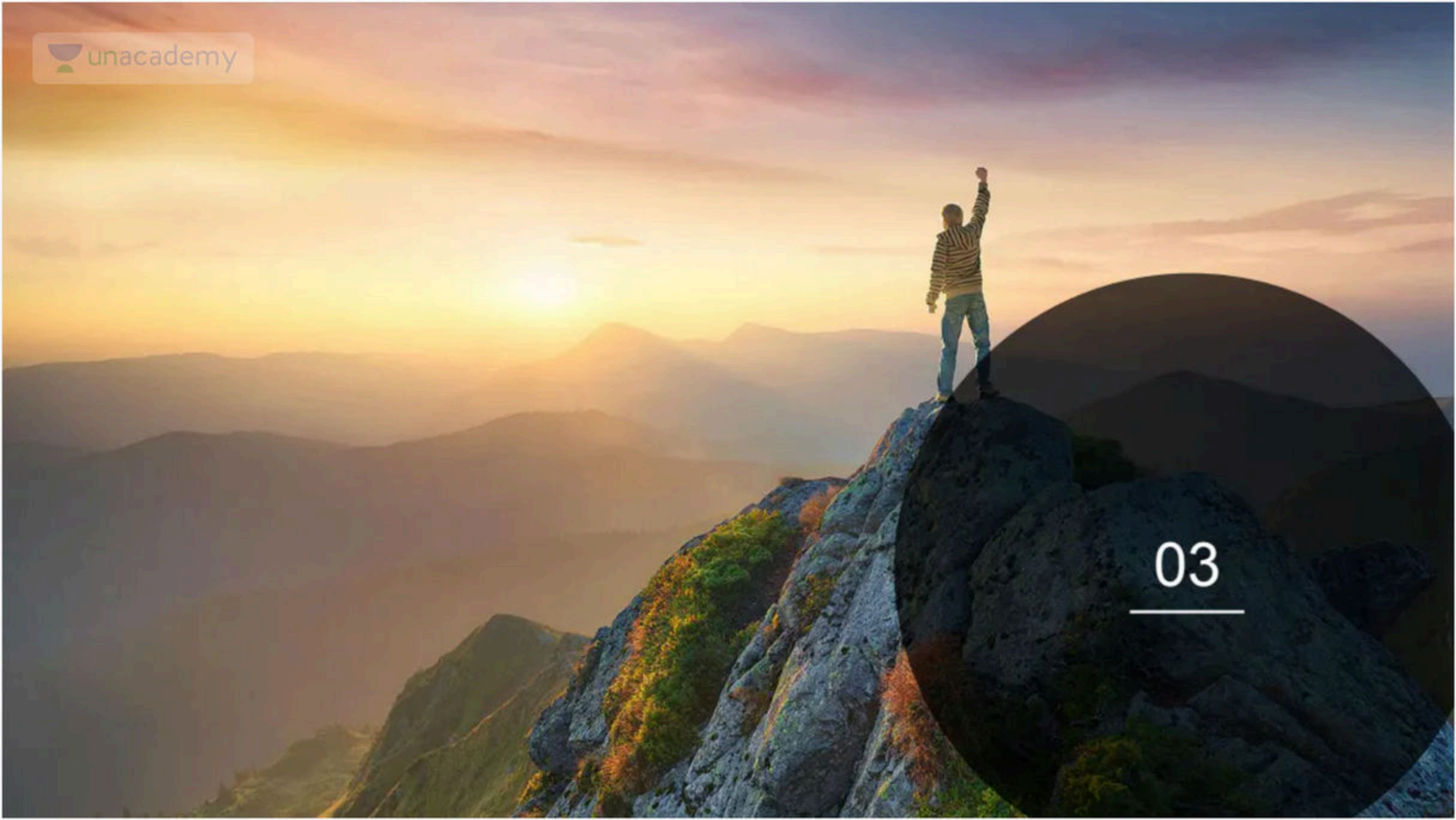
A 0.75

B 1.25

C 2 .25

D 3 .25

IIT, Kharagpur GATE 2022


unacademy
03

unacademy

Both the numerator and the denominator of $\frac{3}{4}$ are increased by a positive integer, x, and those of $\frac{15}{17}$ are decreased by the same integer. This operation results in the same value for both the fractions. What is the value of $x$?

A 1

B 2

C 3

D 4

IIT, Kharagpur GATE 2022

unacademy
04

A survey of 450 students about their subjects of interest resulted in the following outcome:

- 150 students are interested in Mathematics.
- 200 students are interested in Physics.
- 175 students are interested in Chemistry.
- 50 students are interested in Mathematics and Physics.
- 60 students are interested in Physics and Chemistry.
- 40 students are interested in Mathematics and Chemistry.
- 30 students are interested in Mathematics, Physics and Chemistry.
- Remaining students are interested in Humanities.

Based on the above information, the number of students interested in Humanities is

(A) 10

(B) 30

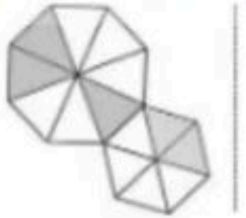
(C) 40

(D) 45

IIT, Kharagpur GATE 2022

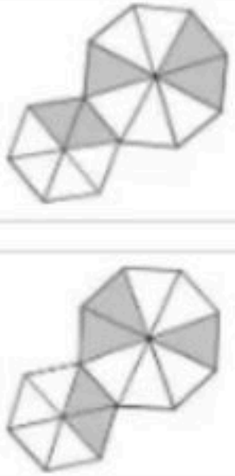
unacademy
05

For the picture shown above, which one of the following is the correct picture representing reflection with respect to the mirror shown as the dotted line?

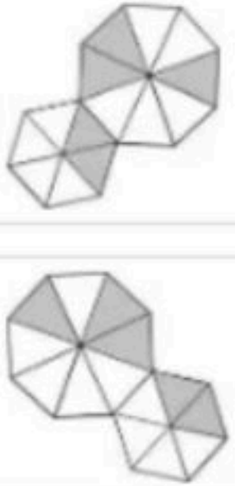


A

B



C



D



IIT, Kharagpur GATE 2022

unacademy
06

In the last few years, several new shopping malls were opened in the city. The total number of visitors in the malls is impressive. However, the total revenue generated through sales in the shops in these malls is generally low.

Which one of the following is the CORRECT logical inference based on the information in the above passage?

A Fewer people are visiting the malls but spending more

B More people are visiting the malls but not spending enough

C More people are visiting the malls and spending more

D Fewer people are visiting the malls and not spending enough

IIT, Kharagpur GATE 2022

© JENNY E. ROSS
unacademy
07

In a partnership business the monthly investment by three friends for the first six months is in the ratio 3: 4: 5 . After six months, they had to increase their monthly investments by 10%, 15% and 20%, respectively, of their initial monthly investment. The new investment ratio was kept constant for the next six months.

What is the ratio of their shares in the total profit (in the same order) at the end of the year such that the share is proportional to their individual total investment over the year?

A 22 : 23 : 24

B 22 : 33 : 50

C 33 : 46 : 60

D 63 : 86 : 110

IIT, Kharagpur GATE 2022

unacademy
08

Consider the following equations of straight lines:

Line L1: $2x - 3y = 5$

Line L2: $3x + 2y = 8$

Line L3: $4x - 6y = 5$

Line L4: $6x - 9y = 6$

Which one among the following is the correct statement?

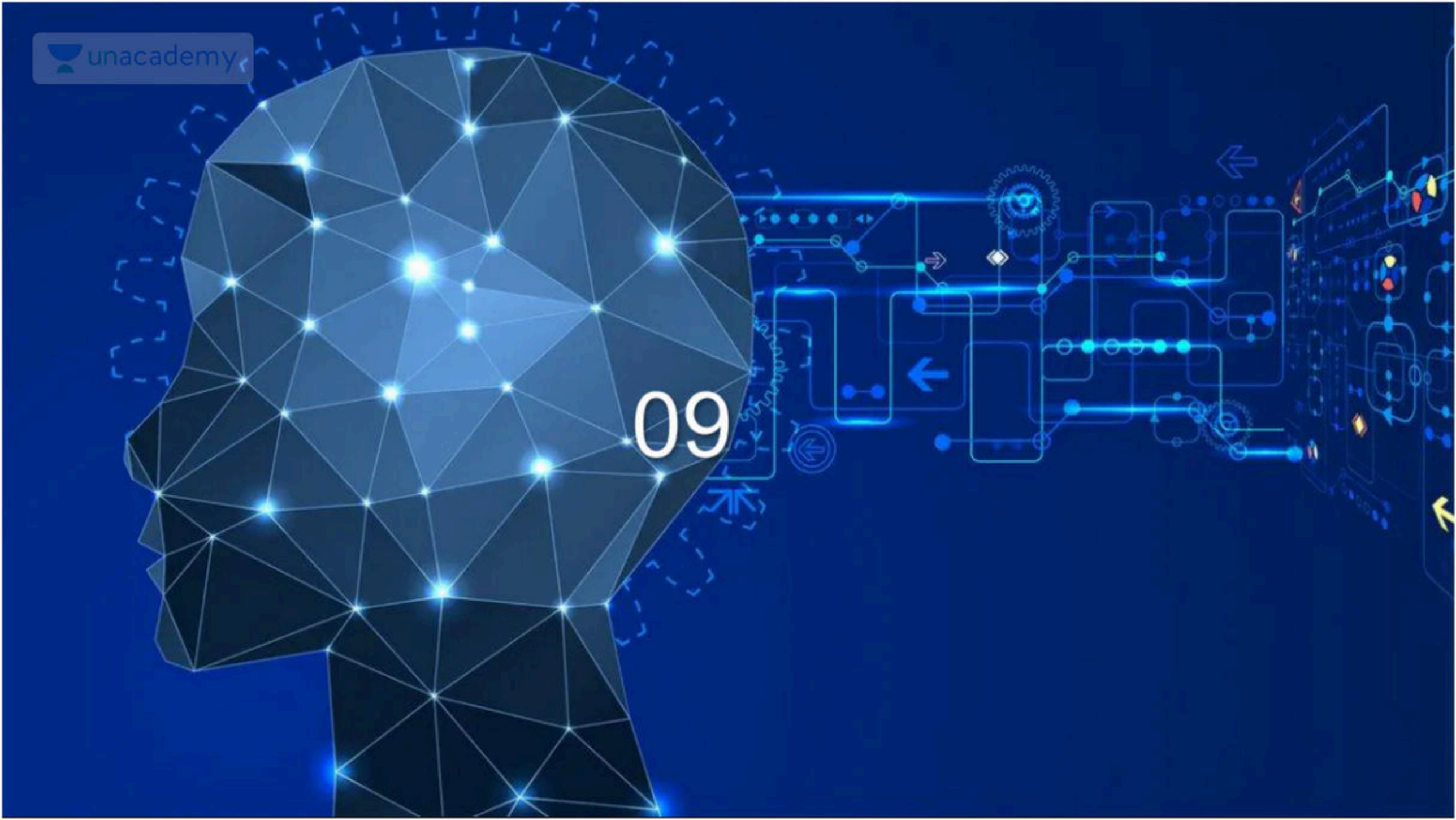
A. L1 is parallel to L2 and L1 is perpendicular to L3

B. L2 is parallel to L4 and L2 is perpendicular to L1

C. L3 is perpendicular to L4 and L3 is parallel to L2

D. L4 is perpendicular to L2 and L4 is parallel to L3

IIT, Kharagpur GATE 2022


unacademy
09

Given below are two statements and four conclusions drawn based on the statements.

unacademy

Statement 1: Some soaps are clean.

Statement 2: All clean objects are wet.

Conclusion I: Some clean objects are soaps.

Conclusion II: No clean object is a soap.

Conclusion III: Some wet objects are soaps.

Conclusion IV: All wet objects are soaps.

Which one of the following options can be logically inferred?

A Only conclusion I is correct

B Either conclusion I or conclusion II is correct

C Either conclusion III or conclusion IV is correct

D Only conclusion I and conclusion III are correct

IIT, Kharagpur GATE 2022

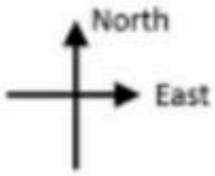
unacademy
10

An ant walks in a straight line on a plane leaving behind a trace of its movement. The initial position of the ant is at point P facing east.

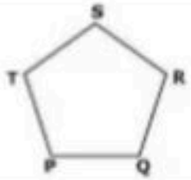
The ant first turns 72° anticlockwise at P, and then does the following two steps in sequence exactly FIVE times before halting.

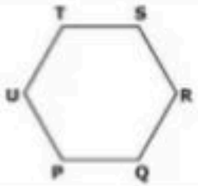
1. moves forward for 10 cm.

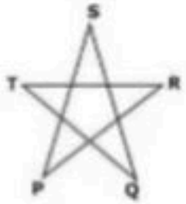
2. turns 144o clockwise.

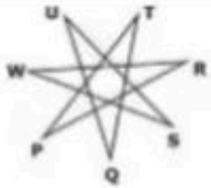



The pattern made by the trace left behind by the ant is

A



B



C



D



**IIT, Kharagpur GATE 2022**

# GATE 2022 (CE Set-02) Civil Engineering

unacademy
01

unacademy

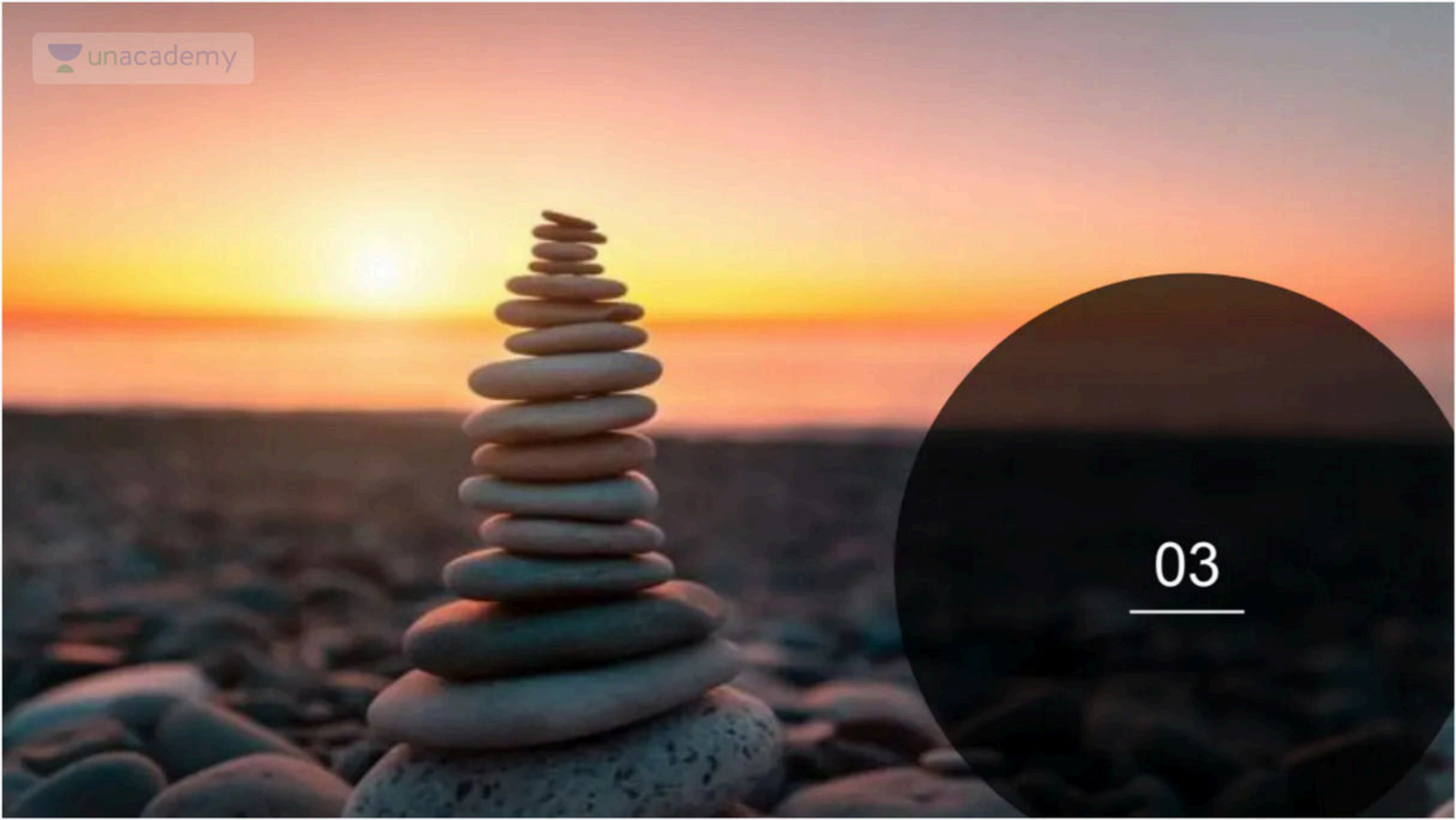
| Q. | You should _____ when to say _____. |
|---|---|
| (A) | no / no |
| (B) | no / know |
| (C) | know / know |
| (D) | know / no |

IIT, Kharagpur GATE 2022

unacademy
02

| | |
|---|---|
| Q. | Two straight lines pass through the origin $(x_0, y_0) = (0,0)$. One of them passes through the point $(x_1, y_1) = (1,3)$ and the other passes through the point $(x_2, y_2) = (1,2)$.<br><br>What is the area enclosed between the straight lines in the interval $[0, 1]$ on the $x$-axis? |
| (A) | 0.5 |
| (B) | 1.0 |
| (C) | 1.5 |
| (D) | 2.0 |

IIT, Kharagpur GATE 2022


unacademy
03

| | |
|---|---|
| Q. | If<br>$p : q = 1 : 2$<br>$q : r = 4 : 3$<br>$r : s = 4 : 5$<br>and $u$ is 50% more than $s$, what is the ratio $p : u$? |
| (A) | $2 : 15$ |
| (B) | $16 : 15$ |
| (C) | $1 : 5$ |
| (D) | $16 : 45$ |

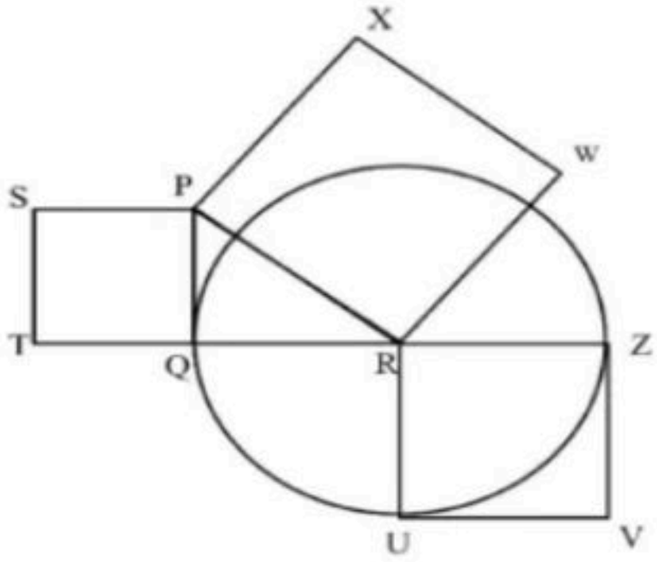
IIT, Kharagpur GATE 2022

04

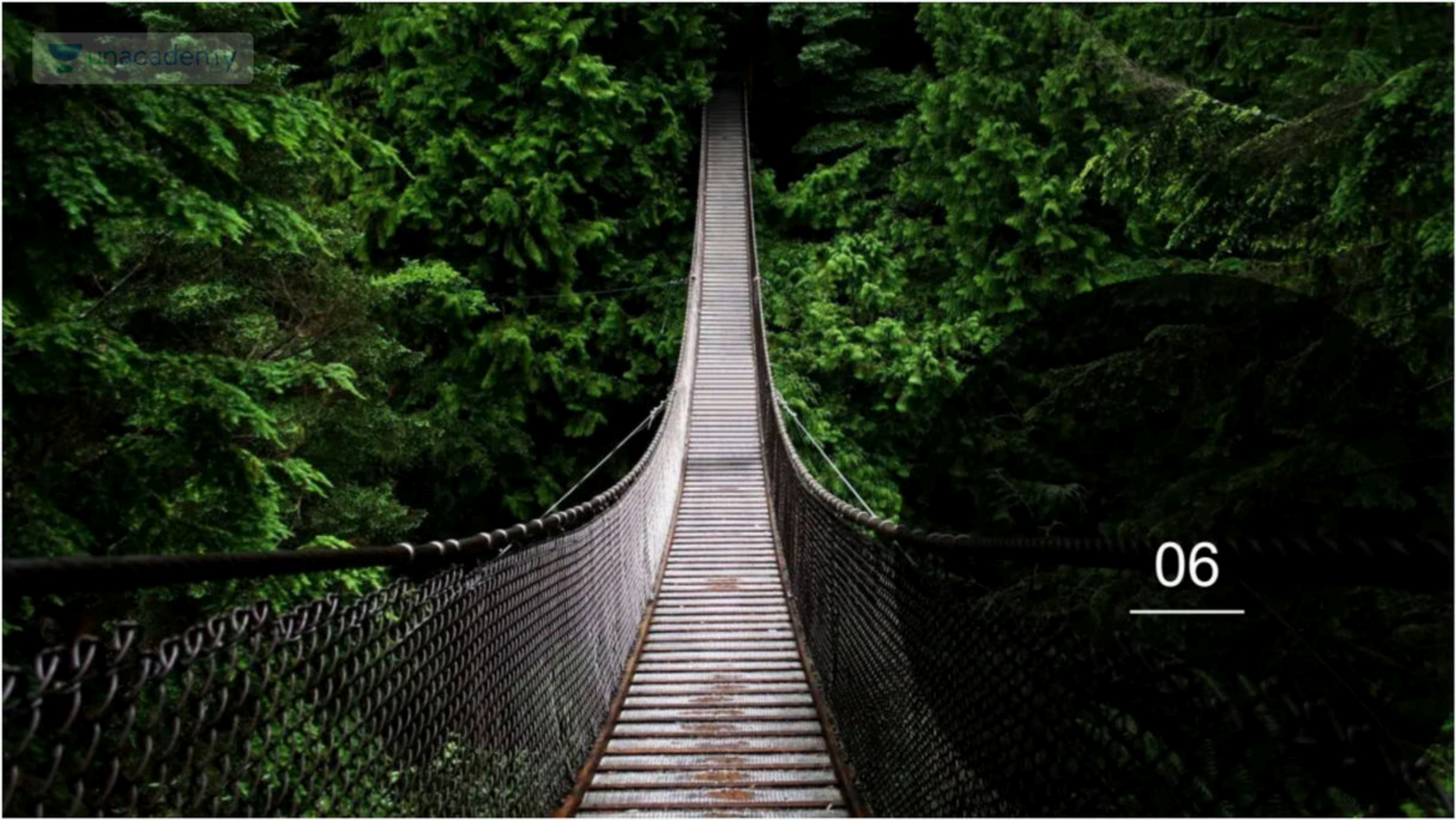
| | |
|---|---|
| Q. | Given the statements:<br>• P is the sister of Q.<br>• Q is the husband of R.<br>• R is the mother of S.<br>• T is the husband of P.<br>Based on the above information, T is _____ of S. |
| (A) | the grandfather |
| (B) | an uncle |
| (C) | the father |
| (D) | a brother |

IIT, Kharagpur GATE 2022

unacademy
05

| | |
|---|---|
| Q | In the following diagram, the point R is the center of the circle. The lines PQ and ZV are tangential to the circle. The relation among the areas of the squares, PXWR, RUVZ and SPQT is   |
| (A) | Area of SPQT = Area of RUVZ = Area of PXWR |
| (B) | Area of SPQT = Area of PXWR – Area of RUVZ |
| (C) | Area of PXWR = Area of SPQT – Area of RUVZ |
| (D) | Area of PXWR = Area of RUVZ – Area of SPQT |

IIT, Kharagpur GATE 2022


unacademy
06

| | |
|---|---|
| Q | Healthy eating is a critical component of healthy aging. When should one start eating healthy? It turns out that it is never too early. For example, babies who start eating healthy in the first year are more likely to have better overall health as they get older.<br><br>Which one of the following is the CORRECT logical inference based on the information in the above passage? |
| (A) | Healthy eating is important for those with good health conditions, but not for others |
| (B) | Eating healthy can be started at any age, earlier the better |
| (C) | Eating healthy and better overall health are more correlated at a young age, but not older age |
| (D) | Healthy eating is more important for adults than kids |

IIT, Kharagpur GATE 2022

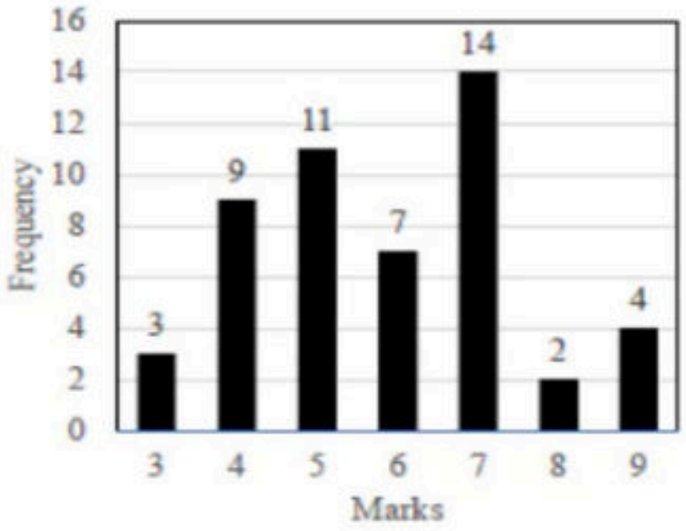
unacademy
07

| | |
|---|---|
| Q. | P invested ₹ 5000 per month for 6 months of a year and Q invested ₹ $x$ per month for 8 months of the year in a partnership business. The profit is shared in proportion to the total investment made in that year.<br><br>If at the end of that investment year, Q receives $\frac{4}{9}$ of the total profit, what is the value of $x$ (in ₹)? |
| (A) | 2500 |
| (B) | 3000 |
| (C) | 4687 |
| (D) | 8437 |

IIT, Kharagpur GATE 2022

unacademy
08

Q.




The above frequency chart shows the frequency distribution of marks obtained by a set of students in an exam.

From the data presented above, which one of the following is CORRECT?

| | |
|---|---|
| (A) | mean > mode > median |
| (B) | mode > median > mean |
| (C) | mode > mean > median |
| (D) | median > mode > mean |

IIT, Kharagpur GATE 2022

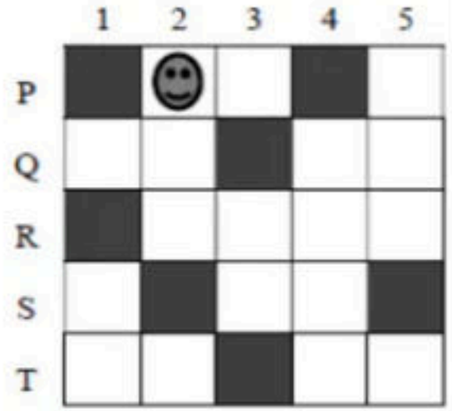
unacademy
09

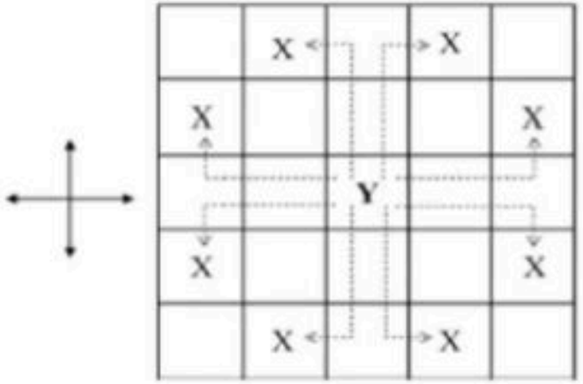
Q. In the square grid shown on the left, a person standing at P2 position is required to move to P5 position.

The only movement allowed for a step involves, "two moves along one direction followed by one move in a perpendicular direction". The permissible directions for movement are shown as dotted arrows in the right.

For example, a person at a given position **Y** can move only to the positions marked X on the right.

Without occupying any of the shaded squares at the end of each step, the minimum number of steps required to go from P2 to P5 is




Example: Allowed steps for a person at **Y**

| | |
|---|---|
| (A) | 4 |
| (B) | 5 |
| (C) | 6 |
| (D) | 7 |

**IIT, Kharagpur GATE 2022**

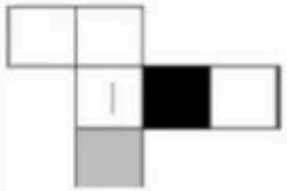
unacademy
10

Q

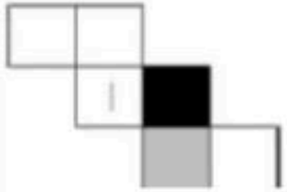
Consider a cube made by folding a single sheet of paper of appropriate shape. The interior faces of the cube are all blank. However, the exterior faces that are not visible in the above view may not be blank.

Which one of the following represents a possible unfolding of the cube?

(A)

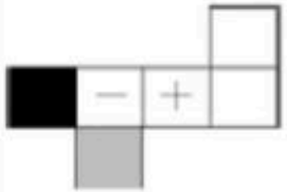


(B)



(C)

(D)



IIT, Kharagpur GATE 2022

# GATE 2022 Computer Science and Information Technology (CS)

unacademy
01

unacademy

| | |
|---|---|
| Q. | The _____ is too high for it to be considered _____. |
| (A) | fair / fare |
| (B) | faer / fair |
| (C) | fare / fare |
| (D) | fare / fair |

IIT, Kharagpur GATE 2022

unacademy
02

unacademy

| | |
|---|---|
| Q. | A function $y(x)$ is defined in the interval $[0, 1]$ on the $x$-axis as $$y(x) = \begin{cases} 2 & \text{if } 0 \le x < \frac{1}{3} \\ 3 & \text{if } \frac{1}{3} \le x < \frac{3}{4} \\ 1 & \text{if } \frac{3}{4} \le x \le 1 \end{cases}$$ Which one of the following is the area under the curve for the interval $[0, 1]$ on the $x$-axis? |
| (A) | $\frac{5}{6}$ |
| (B) | $\frac{6}{5}$ |
| (C) | $\frac{13}{6}$ |
| (D) | $\frac{6}{13}$ |

IIT, Kharagpur GATE 2022

unacademy
03

| | |
|---|---|
| Q. | Let $r$ be a root of the equation $x^2 + 2x + 6 = 0$.<br><br>Then the value of the expression $(r+2)(r+3)(r+4)(r+5)$ is |
| (A) | 51 |
| (B) | $-51$ |
| (C) | 126 |
| (D) | $-126$ |

IIT, Kharagpur GATE 2022

unacademy
04

unacademy

| | |
|---|---|
| Q. | Given below are four statements.<br><br>Statement 1: All students are inquisitive.<br><br>Statement 2: Some students are inquisitive.<br><br>Statement 3: No student is inquisitive.<br><br>Statement 4: Some students are not inquisitive.<br><br>From the given four statements, find the two statements that **CANNOT BE TRUE** simultaneously, assuming that there is at least one student in the class. |
| (A) | Statement 1 and Statement 3 |
| (B) | Statement 1 and Statement 2 |
| (C) | Statement 2 and Statement 4 |
| (D) | Statement 3 and Statement 4 |

**IIT, Kharagpur GATE 2022**

unacademy
05

| | |
|---|---|
| Q. | A palindrome is a word that reads the same forwards and backwards. In a game of words, a player has the following two plates painted with letters.<br><br>A D<br><br>From the additional plates given in the options, which one of the combinations of additional plates would allow the player to construct a five-letter palindrome. The player should use all the five plates exactly once. The plates can be rotated in their plane. |
| (A) | D D J |
| (B) | R A R |
| (C) | Z E D |
| (D) | I L Y |

IIT, Kharagpur GATE 2022

unacademy
06

| | |
|---|---|
| Q. | Some people believe that "what gets measured, improves". Some others believe that "what gets measured, gets gamed". One possible reason for the difference in the beliefs is the work culture in organizations. In organizations with good work culture, metrics help improve outcomes. However, the same metrics are counterproductive in organizations with poor work culture.<br><br>Which one of the following is the CORRECT logical inference based on the information in the above passage? |
| (A) | Metrics are useful in organizations with poor work culture |
| (B) | Metrics are useful in organizations with good work culture |
| (C) | Metrics are always counterproductive in organizations with good work culture |
| (D) | Metrics are never useful in organizations with good work culture |

IIT, Kharagpur GATE 2022

unacademy
07

| | |
|---|---|
| Q. | In a recently conducted national entrance test, boys constituted 65% of those who appeared for the test. Girls constituted the remaining candidates and they accounted for 60% of the qualified candidates.<br><br>Which one of the following is the correct logical inference based on the information provided in the above passage? |
| (A) | Equal number of boys and girls qualified |
| (B) | Equal number of boys and girls appeared for the test |
| (C) | The number of boys who appeared for the test is less than the number of girls who appeared |
| (D) | The number of boys who qualified the test is less than the number of girls who qualified |

IIT, Kharagpur GATE 2022

08

| | |
|---|---|
| Q. | A box contains five balls of same size and shape. Three of them are green coloured balls and two of them are orange coloured balls. Balls are drawn from the box one at a time. If a green ball is drawn, it is not replaced. If an orange ball is drawn, it is replaced with another orange ball.<br><br>First ball is drawn. What is the probability of getting an orange ball in the next draw? |
| (A) | $\frac{1}{2}$ |
| (B) | $\frac{8}{25}$ |
| (C) | $\frac{19}{50}$ |
| (D) | $\frac{23}{50}$ |

IIT, Kharagpur GATE 2022

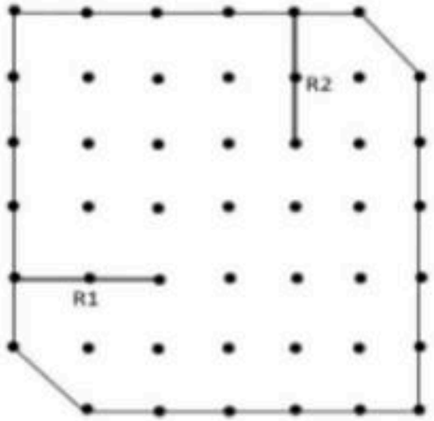
Success
Ahead

unacademy

| | |
|---|---|
| Q. | The corners and mid-points of the sides of a triangle are named using the distinct letters P, Q, R, S, T and U, but not necessarily in the same order. Consider the following statements:<br>• The line joining P and R is parallel to the line joining Q and S.<br>• P is placed on the side opposite to the corner T.<br>• S and U cannot be placed on the same side.<br>Which one of the following statements is correct based on the above information? |
| (A) | P cannot be placed at a corner |
| (B) | S cannot be placed at a corner |
| (C) | U cannot be placed at a mid-point |
| (D) | R cannot be placed at a corner |

IIT, Kharagpur GATE 2022

unacademy
10

| | |
|---|---|
| Q.10 | A plot of land must be divided between four families. They want their individual plots to be similar in shape, not necessarily equal in area. The land has equally spaced poles, marked as dots in the below figure. Two ropes, R1 and R2, are already present and cannot be moved.<br><br>What is the least number of **additional** straight ropes needed to create the desired plots? A single rope can pass through three poles that are aligned in a straight line.<br><br>  <br> |
| (A) | 2 |
| (B) | 4 |
| (C) | 5 |
| (D) | 3 |

IIT, Kharagpur GATE 2022

# GATE 2022 Electrical Engineering (EE)

unacademy
Success
Ahead
01

| | |
|---|---|
| Q. | As you grow older, an injury to your _____ may take longer to _____. |
| (A) | heel / heel |
| (B) | heal / heel |
| (C) | heal / heal |
| (D) | heel / heal |

IIT, Kharagpur GATE 2022

unacademy
02

| | |
|---|---|
| Q. | In a 500 m race, P and Q have speeds in the ratio of 3 : 4. Q starts the race when P has already covered 140 m.<br><br>What is the distance between P and Q (in m) when P wins the race? |
| (A) | 20 |
| (B) | 40 |
| (C) | 60 |
| (D) | 140 |

IIT, Kharagpur GATE 2022

unacademy
03

| | |
|---|---|
| Q.. | Three bells P, Q, and R are rung periodically in a school. P is rung every 20 minutes; Q is rung every 30 minutes and R is rung every 50 minutes.<br><br>If all the three bells are rung at 12:00 PM, when will the three bells ring together again the next time? |
| (A) | 5:00 PM |
| (B) | 5:30 PM |
| (C) | 6:00 PM |
| (D) | 6:30 PM |

IIT, Kharagpur GATE 2022

unacademy

04

unacademy

| | |
|---|---|
| Q. | Given below are two statements and four conclusions drawn based on the statements.<br><br>Statement 1: Some bottles are cups.<br><br>Statement 2: All cups are knives.<br><br>Conclusion I: Some bottles are knives.<br><br>Conclusion II: Some knives are cups.<br><br>Conclusion III: All cups are bottles.<br><br>Conclusion IV: All knives are cups.<br><br>Which one of the following options can be logically inferred? |
| (A) | Only conclusion I and conclusion II are correct |
| (B) | Only conclusion II and conclusion III are correct |
| (C) | Only conclusion II and conclusion IV are correct |
| (D) | Only conclusion III and conclusion IV are correct |

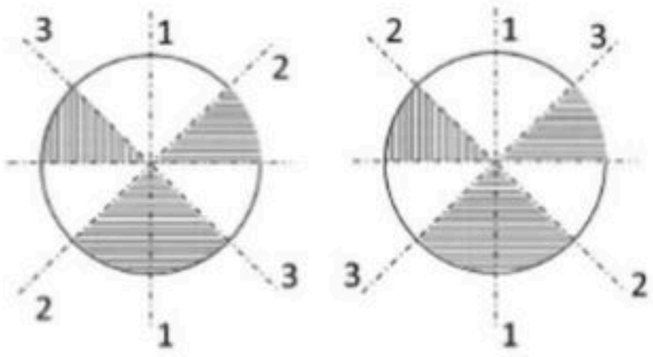
IIT, Kharagpur GATE 2022

unacademy

05

Q. The figure below shows the front and rear view of a disc, which is shaded with identical patterns. The disc is flipped once with respect to any one of the fixed axes 1-1, 2-2 or 3-3 chosen uniformly at random.

What is the probability that the disc **DOES NOT** retain the same front and rear views after the flipping operation?




Front View Rear View

| | |
|---|---|
| (A) | 0 |
| (B) | $\frac{1}{3}$ |
| (C) | $\frac{2}{3}$ |
| (D) | 1 |

IIT, Kharagpur GATE 2022

unacademy
06

unacademy

| | |
|---|---|
| Q. | Altruism is the human concern for the wellbeing of others. Altruism has been shown to be motivated more by social bonding, familiarity and identification of belongingness to a group. The notion that altruism may be attributed to empathy or guilt has now been rejected.<br><br>Which one of the following is the CORRECT logical inference based on the information in the above passage? |
| (A) | Humans engage in altruism due to guilt but not empathy |
| (B) | Humans engage in altruism due to empathy but not guilt |
| (C) | Humans engage in altruism due to group identification but not empathy |
| (D) | Humans engage in altruism due to empathy but not familiarity |

IIT, Kharagpur GATE 2022

07

| | |
|---|---|
| Q. | There are two identical dice with a single letter on each of the faces. The following six letters: Q, R, S, T, U, and V, one on each of the faces. Any of the six outcomes are equally likely.<br><br>The two dice are thrown once independently at random.<br><br>What is the probability that the outcomes on the dice were composed only of any combination of the following possible outcomes: Q, U and V? |
| (A) | $\frac{1}{4}$ |
| (B) | $\frac{3}{4}$ |
| (C) | $\frac{1}{6}$ |
| (D) | $\frac{5}{36}$ |

IIT, Kharagpur GATE 2022

unacademy
08

| | |
|---|---|
| Q. | The price of an item is 10% cheaper in an online store S compared to the price at another online store M. Store S charges ₹ 150 for delivery. There are no delivery charges for orders from the store M. A person bought the item from the store S and saved ₹ 100.<br><br>What is the price of the item at the online store S (in ₹) if there are no other charges than what is described above? |
| (A) | 2500 |
| (B) | 2250 |
| (C) | 1750 |
| (D) | 1500 |

IIT, Kharagpur GATE 2022

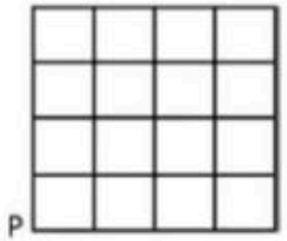
unacademy
09

| | |
|---|---|
| Q. | The letters P, Q, R, S, T and U are to be placed one per vertex on a regular convex hexagon, but not necessarily in the same order.<br><br>Consider the following statements:<br><br>• The line segment joining R and S is longer than the line segment joining P and Q.<br>• The line segment joining R and S is perpendicular to the line segment joining P and Q.<br>• The line segment joining R and U is parallel to the line segment joining T and Q.<br><br>Based on the above statements, which one of the following options is CORRECT? |
| (A) | The line segment joining R and T is parallel to the line segment joining Q and S |
| (B) | The line segment joining T and Q is parallel to the line joining P and U |
| (C) | The line segment joining R and P is perpendicular to the line segment joining U and Q |
| (D) | The line segment joining Q and S is perpendicular to the line segment joining R and P |

IIT, Kharagpur GATE 2022

unacademy
10

Q.

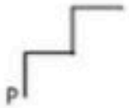



An ant is at the bottom-left corner of a grid (point P) as shown above. It aims to move to the top-right corner of the grid. The ant moves only along the lines marked in the grid such that the current distance to the top-right corner strictly decreases.

Which one of the following is a part of a possible trajectory of the ant during the movement?

(A)


(B)


(C) 


(D)


IIT, Kharagpur GATE 2022

# GATE 2022 Metallurgical Engineering (MT)

unacademy
01

unacademy

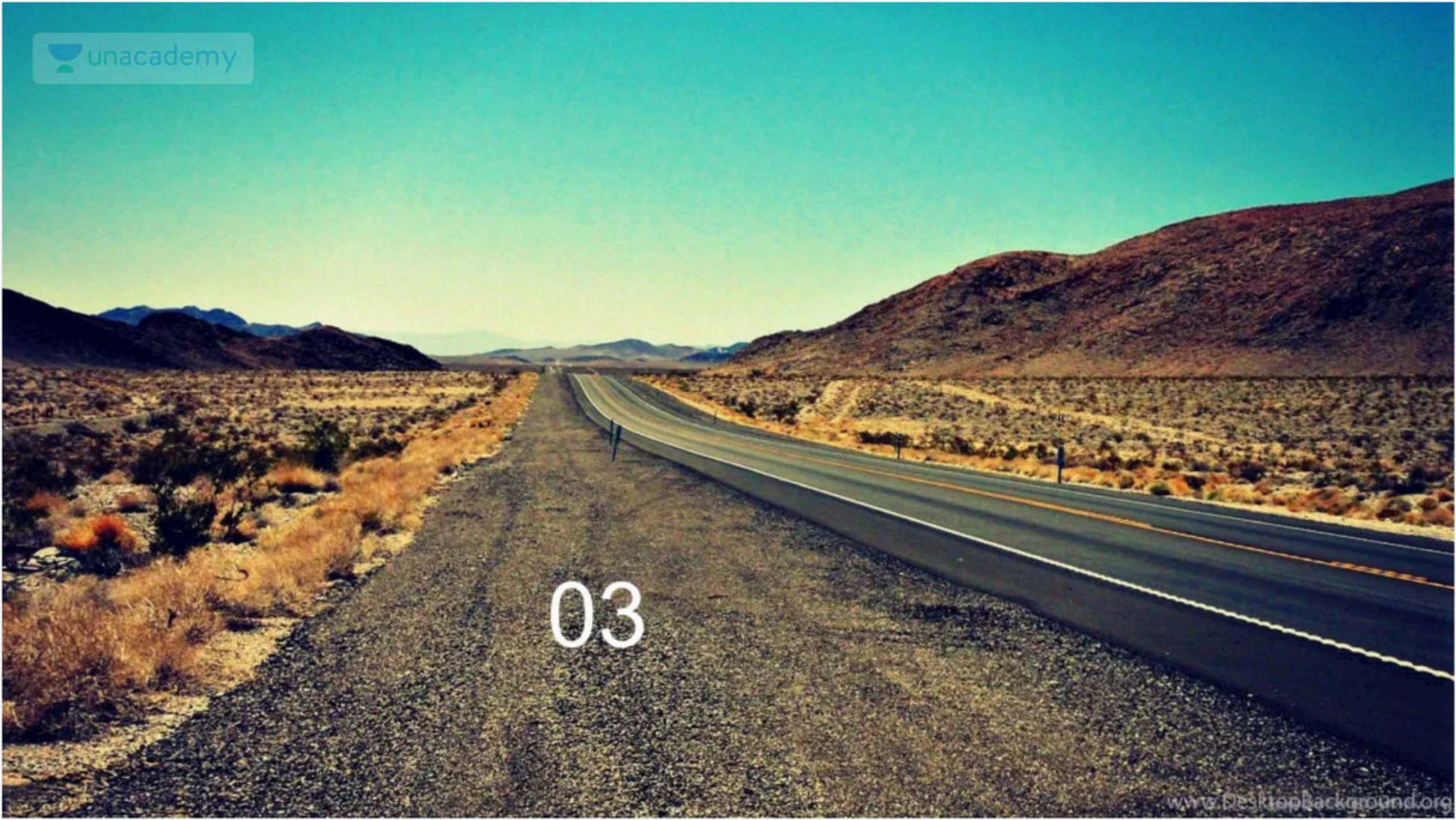
| Q. | Mr. X speaks _____ Japanese _____ Chinese. |
|---|---|
| (A) | neither / or |
| (B) | either / nor |
| (C) | neither / nor |
| (D) | also / but |

IIT, Kharagpur GATE 2022

unacademy
02

| | |
|---|---|
| Q. | A sum of money is to be distributed among P, Q, R, and S in the proportion 5 : 2 : 4 : 3, respectively.<br><br>If R gets ₹ 1000 more than S, what is the share of Q (in ₹)? |
| (A) | 500 |
| (B) | 1000 |
| (C) | 1500 |
| (D) | 2000 |

IIT, Kharagpur GATE 2022

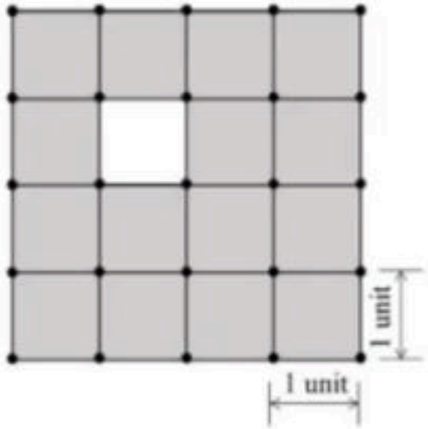

unacademy
03
www.DesktopBackground.org

| | |
|---|---|
| Q. | A trapezium has vertices marked as P, Q, R and S (in that order anticlockwise). The side PQ is parallel to side SR.<br><br>Further, it is given that, PQ = 11 cm, QR = 4 cm, RS = 6 cm and SP = 3 cm.<br><br>What is the shortest distance between PQ and SR (in cm)? |
| (A) | 1.80 |
| (B) | 2.40 |
| (C) | 4.20 |
| (D) | 5.76 |

IIT, Kharagpur GATE 2022

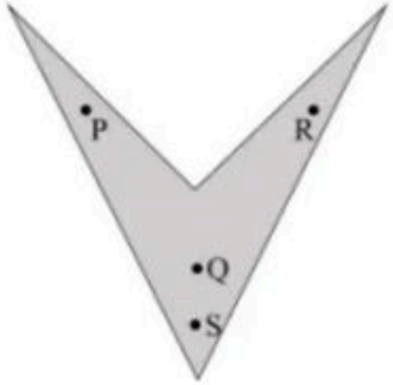
unacademy
04

unacademy

| | |
|---|---|
| Q. | The figure shows a grid formed by a collection of unit squares. The unshaded unit square in the grid represents a hole.<br>  <br><br>What is the maximum number of squares without a "hole in the interior" that can be formed within the $4 \times 4$ grid using the unit squares as building blocks? |
| (A) | 15 |
| (B) | 20 |
| (C) | 21 |
| (D) | 26 |

IIT, Kharagpur GATE 2022

unacademy
05

| | |
|---|---|
| Q. | An art gallery engages a security guard to ensure that the items displayed are protected. The diagram below represents the plan of the gallery where the boundary walls are opaque. The location the security guard posted is identified such that all the inner space (shaded region in the plan) of the gallery is within the line of sight of the security guard.<br><br>If the security guard does not move around the posted location and has a 360° view, which one of the following correctly represents the set of ALL possible locations among the locations P, Q, R and S, where the security guard can be posted to watch over the entire inner space of the gallery.<br><br>  |
| (A) | P and Q |
| (B) | Q |
| (C) | Q and S |
| (D) | R and S |

IIT, Kharagpur GATE 2022

unacademy
06

| | |
|---|---|
| Q. | Mosquitoes pose a threat to human health. Controlling mosquitoes using chemicals may have undesired consequences. In Florida, authorities have used genetically modified mosquitoes to control the overall mosquito population. It remains to be seen if this novel approach has unforeseen consequences.<br><br>Which one of the following is the correct logical inference based on the information in the above passage? |
| (A) | Using chemicals to kill mosquitoes is better than using genetically modified mosquitoes because genetic engineering is dangerous |
| (B) | Using genetically modified mosquitoes is better than using chemicals to kill mosquitoes because they do not have any side effects |
| (C) | Both using genetically modified mosquitoes and chemicals have undesired consequences and can be dangerous |
| (D) | Using chemicals to kill mosquitoes may have undesired consequences but it is not clear if using genetically modified mosquitoes has any negative consequence |

IIT, Kharagpur GATE 2022

unacademy
07
A Dreamy World

| | |
|---|---|
| Q. | Consider the following inequalities.<br>(i) $2x - 1 > 7$<br>(ii) $2x - 9 < 1$<br><br>Which one of the following expressions below satisfies the above two inequalities? |
| (A) | $x \leq -4$ |
| (B) | $-4 < x \leq 4$ |
| (C) | $4 < x < 5$ |
| (D) | $x \geq 5$ |

IIT, Kharagpur GATE 2022

unacademy
08

| | |
|---|---|
| Q. | Four points $P(0,1)$, $Q(0,-3)$, $R(-2,-1)$, and $S(2,-1)$ represent the vertices of a quadrilateral.<br><br>What is the area enclosed by the quadrilateral? |
| (A) | 4 |
| (B) | $4\sqrt{2}$ |
| (C) | 8 |
| (D) | $8\sqrt{2}$ |

IIT, Kharagpur GATE 2022

unacademy
09

| | |
|---|---|
| Q. | In a class of five students P, Q, R, S and T, only one student is known to have copied in the exam. The disciplinary committee has investigated the situation and recorded the statements from the students as given below.<br><br>**Statement of P**: R has copied in the exam.<br><br>**Statement of Q**: S has copied in the exam.<br><br>**Statement of R**: P did not copy in the exam.<br><br>**Statement of S**: Only one of us is telling the truth.<br><br>**Statement of T**: R is telling the truth.<br><br>The investigating team had authentic information that S never lies.<br><br>Based on the information given above, the person who has copied in the exam is |
| (A) | R |
| (B) | P |
| (C) | Q |
| (D) | T |

IIT, Kharagpur GATE 2022

unacademy
10

unacademy

| | |
|---|---|
| Q.10 | Consider the following square with the four corners and the center marked as P, Q, R, S and T respectively.<br> <br><br>Let X, Y and Z represent the following operations:<br>X: rotation of the square by 180 degree with respect to the S-Q axis.<br>Y: rotation of the square by 180 degree with respect to the P-R axis.<br>Z: rotation of the square by 90 degree clockwise with respect to the axis perpendicular, going into the screen and passing through the point T.<br>Consider the following three distinct sequences of operation (which are applied in the left to right order).<br>(1) XYZZ<br>(2) XY<br>(3) ZZZZ<br>Which one of the following statements is correct as per the information provided above? |
| (A) | The sequence of operations (1) and (2) are equivalent |
| (B) | The sequence of operations (1) and (3) are equivalent |
| (C) | The sequence of operations (2) and (3) are equivalent |
| (D) | The sequence of operations (1), (2) and (3) are equivalent |

IIT, Kharagpur GATE 2022

# GATE 2022 Chemical Engineering- CH

unacademy
01

| Q. | Inhaling the smoke from a burning _____ could _____ you quickly. |
|---|---|
| (A) | tire / tier |
| (B) | tire / tyre |
| (C) | tyre / tire |
| (D) | tyre / tier |

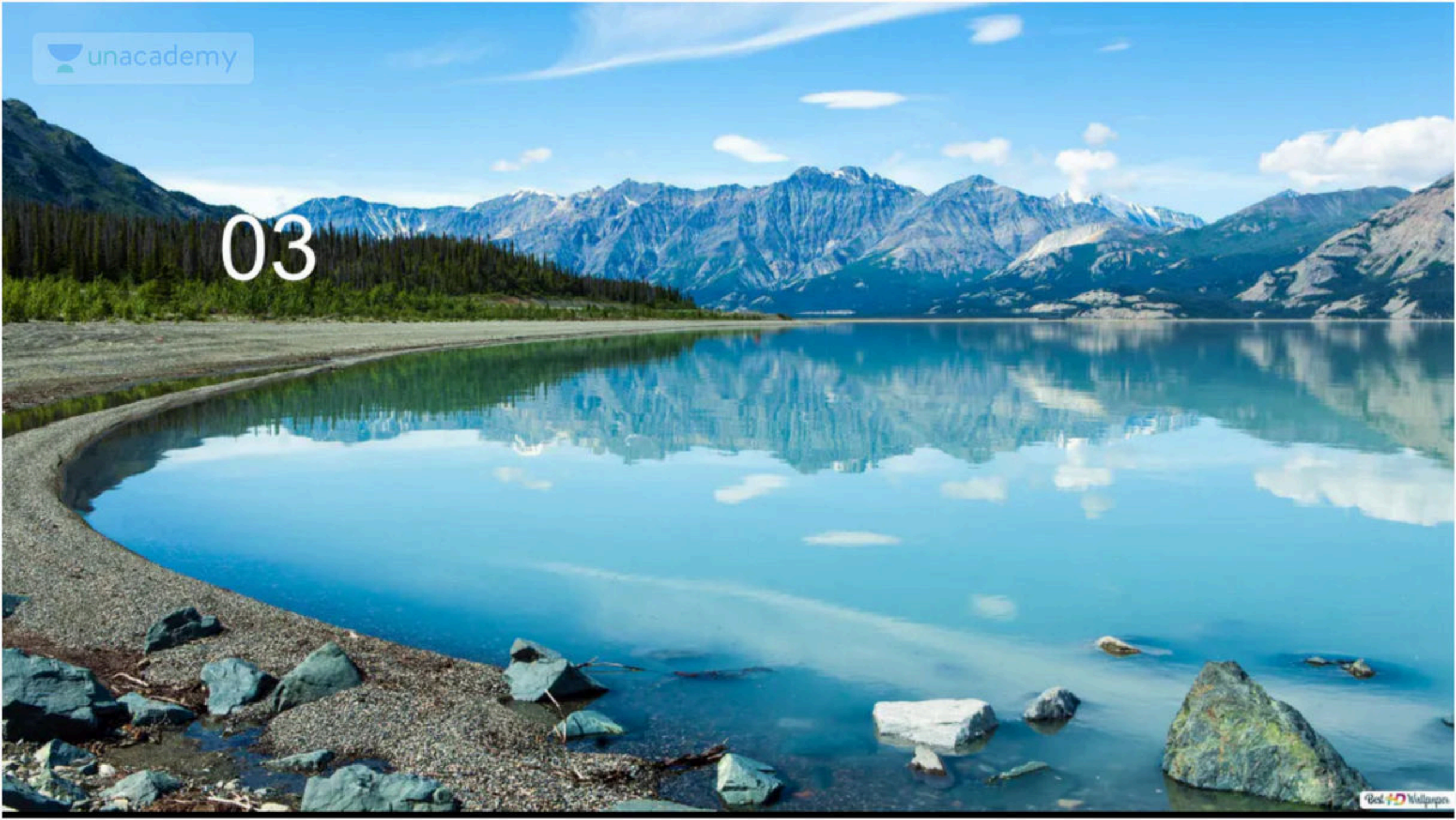
IIT, Kharagpur GATE 2022

unacademy
02

unacademy

| | |
|---|---|
| Q. | A sphere of radius $r$ cm is packed in a box of cubical shape.<br><br>What should be the minimum volume (in $cm^3$) of the box that can enclose the sphere? |
| (A) | $\frac{r^3}{8}$ |
| (B) | $r^3$ |
| (C) | $2r^3$ |
| (D) | $8r^3$ |

IIT, Kharagpur GATE 2022


unacademy
03

| | |
|---|---|
| Q. | Pipes P and Q can fill a storage tank in full with water in 10 and 6 minutes, respectively. Pipe R draws the water out from the storage tank at a rate of 34 litres per minute. P, Q and R operate at a constant rate.<br><br>If it takes one hour to completely empty a full storage tank with all the pipes operating simultaneously, what is the capacity of the storage tank (in litres)? |
| (A) | 26.8 |
| (B) | 60.0 |
| (C) | 120.0 |
| (D) | 127.5 |

IIT, Kharagpur GATE 2022

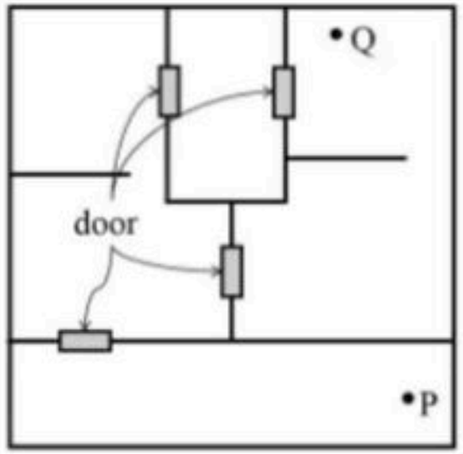
unacademy
04

unacademy

| | |
|---|---|
| Q. | Six persons P, Q, R, S, T and U are sitting around a circular table facing the center not necessarily in the same order. Consider the following statements:<br>• P sits next to S and T.<br>• Q sits diametrically opposite to P.<br>• The shortest distance between S and R is equal to the shortest distance between T and U.<br>Based on the above statements, Q is a neighbor of |
| (A) | U and S |
| (B) | R and T |
| (C) | R and U |
| (D) | P and S |

IIT, Kharagpur GATE 2022

unacademy
05

| | |
|---|---|
| Q.5 | A building has several rooms and doors as shown in the top view of the building given below. The doors are closed initially.<br><br>What is the minimum number of doors that need to be opened in order to go from the point P to the point Q?<br><br>  |
| (A) | 4 |
| (B) | 3 |
| (C) | 2 |
| (D) | 1 |

IIT, Kharagpur GATE 2022

unacademy
06

| | |
|---|---|
| Q. | Rice, a versatile and inexpensive source of carbohydrate, is a critical component of diet worldwide. Climate change, causing extreme weather, poses a threat to sustained availability of rice. Scientists are working on developing Green Super Rice (GSR), which is resilient under extreme weather conditions yet gives higher yields sustainably.<br><br>Which one of the following is the CORRECT logical inference based on the information given in the above passage? |
| (A) | GSR is an alternative to regular rice, but it grows only in an extreme weather |
| (B) | GSR may be used in future in response to adverse effects of climate change |
| (C) | GSR grows in an extreme weather, but the quantity of produce is lesser than regular rice |
| (D) | Regular rice will continue to provide good yields even in extreme weather |

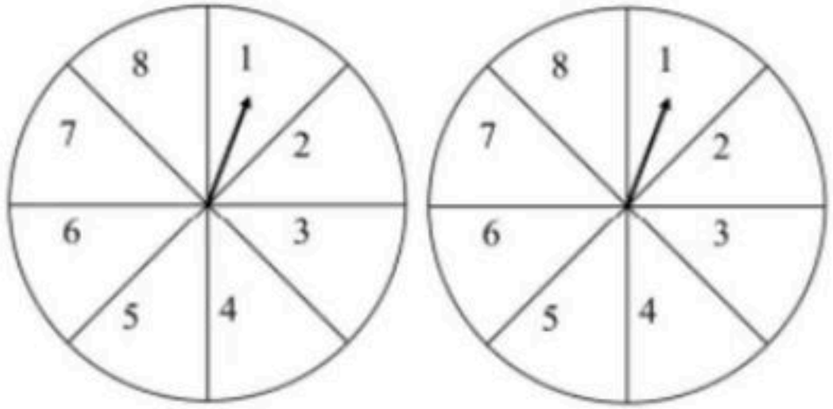
IIT, Kharagpur GATE 2022

unacademy
07

Q. A game consists of spinning an arrow around a stationary disk as shown below. When the arrow comes to rest, there are eight equally likely outcomes. It could come to rest in any one of the sectors numbered 1, 2, 3, 4, 5, 6, 7 or 8 as shown.

Two such disks are used in a game where their arrows are independently spun.

What is the probability that the sum of the numbers on the resulting sectors upon spinning the two disks is equal to 8 after the arrows come to rest?




(A) $\frac{1}{16}$

(B) $\frac{5}{64}$

(C) $\frac{3}{32}$

(D) $\frac{7}{64}$

IIT, Kharagpur GATE 2022

unacademy
08

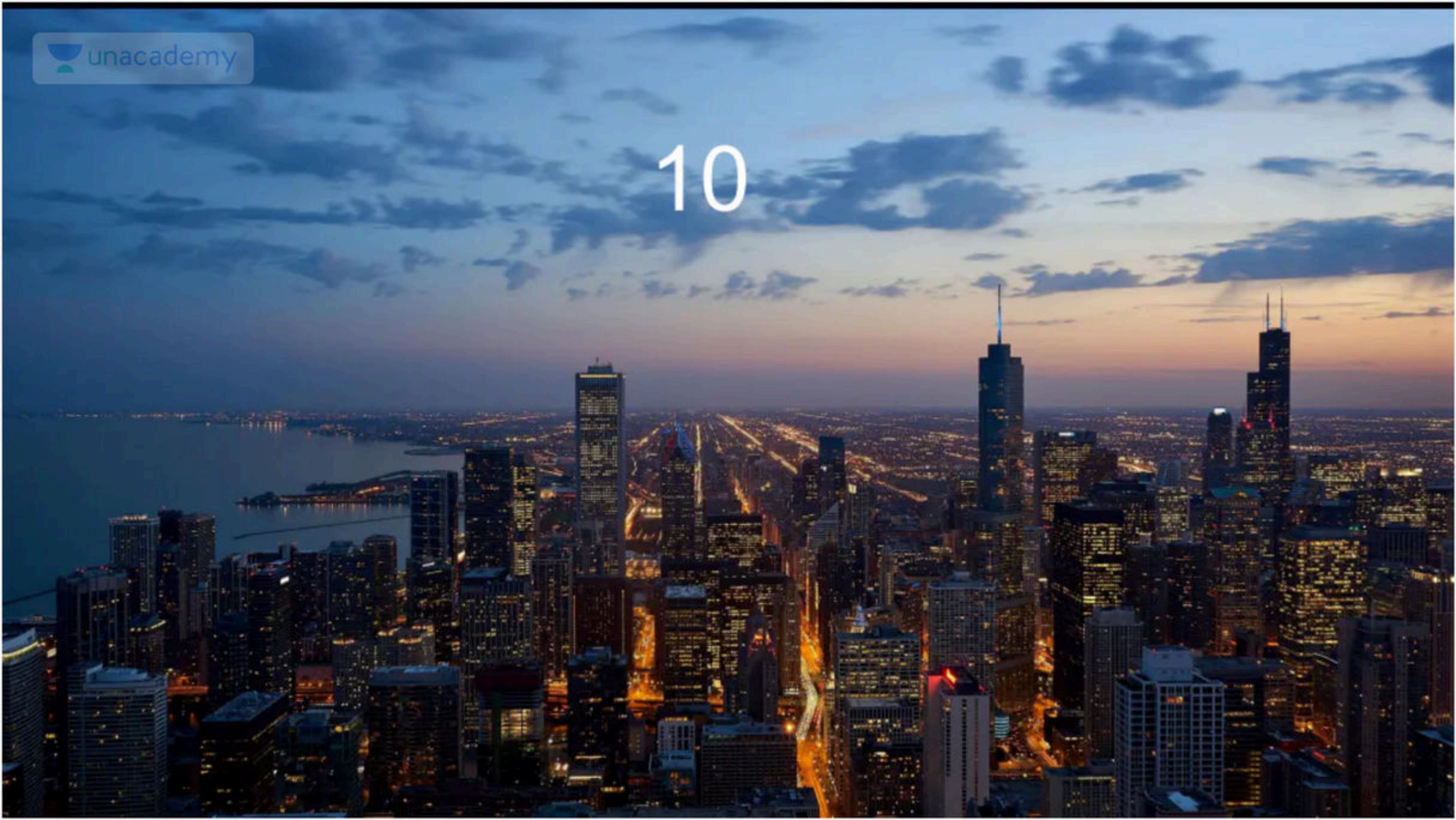
| | |
|---|---|
| Q. | Consider the following inequalities.<br>(i) $3p - q < 4$<br>(ii) $3q - p < 12$<br>Which one of the following expressions below satisfies the above two inequalities? |
| (A) | $p + q < 8$ |
| (B) | $p + q = 8$ |
| (C) | $8 \leq p + q < 16$ |
| (D) | $p + q \geq 16$ |

IIT, Kharagpur GATE 2022

unacademy
09

| | |
|---|---|
| Q. | Given below are three statements and four conclusions drawn based on the statements.<br><br>Statement 1: Some engineers are writers.<br><br>Statement 2: No writer is an actor.<br><br>Statement 3: All actors are engineers.<br><br>Conclusion I: Some writers are engineers.<br><br>Conclusion II: All engineers are actors.<br><br>Conclusion III: No actor is a writer.<br><br>Conclusion IV: Some actors are writers.<br><br>Which one of the following options can be logically inferred? |
| (A) | Only conclusion I is correct |
| (B) | Only conclusion II and conclusion III are correct |
| (C) | Only conclusion I and conclusion III are correct |
| (D) | Either conclusion III or conclusion IV is correct |

IIT, Kharagpur GATE 2022

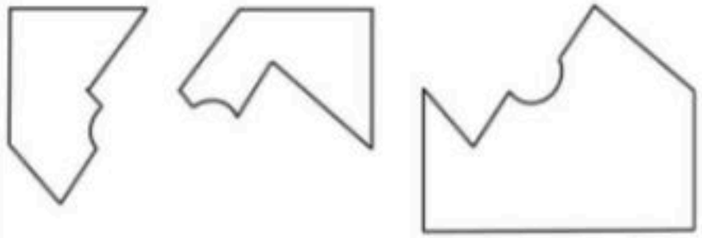

unacademy
10

Q. Which one of the following sets of pieces can be assembled to form a square with a single round hole near the center? Pieces cannot overlap.

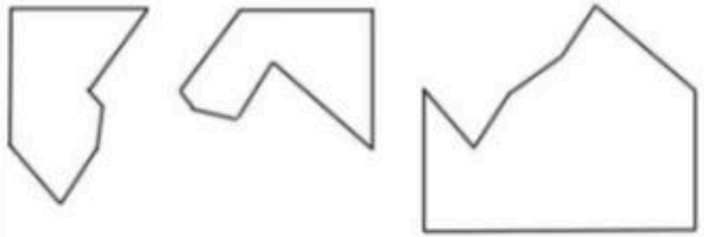
(A)

(B)

(C)



(D)



IIT, Kharagpur GATE 2022

# GATE 2022 Electronics and Communications (EC)

unacademy
01

unacademy

Mr. X speaks _____ Japanese _____ Chinese.

A neither/or

B either/nor

C neither/nor

D also/but

IIT, Kharagpur GATE 2022

unacademy
02

unacademy

A sum of money is to be distributed among P, Q, R, and S in the proportion 5 : 2 : 4 : 3, respectively. If R gets ₹ 1000 more than S, what is the share of Q (in ₹)?

A 500

B 1000

C 1500

D 2000

IIT, Kharagpur GATE 2022

unacademy

03

unacademy

A trapezium has vertices marked as P, Q, R and S (in that order anticlockwise). The side PQ is parallel to side SR. Further, it is given that, PQ = 11 cm, QR = 4 cm, RS = 6 cm and SP = 3 cm. What is the shortest distance between PQ and SR (in cm)?

A 1.80

B 2.40

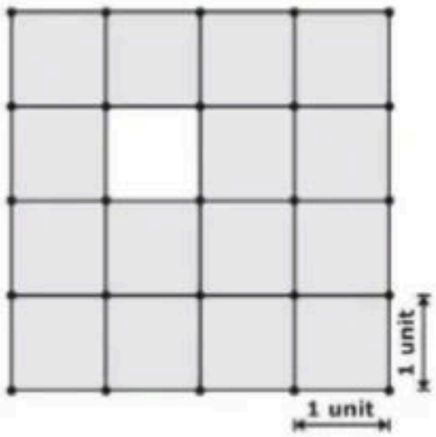
C 4.20

D 5.76

IIT, Kharagpur GATE 2022

unacademy
04

The figure shows a grid formed by a collection of unit squares. The unshaded unit square in the grid represents a hole.




What is the maximum number of squares without a "hole in the interior" that can be formed within the 4 × 4 grid using the unit squares as building blocks?

A 15

B 20

C 21

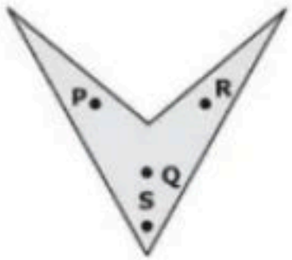
D 26

IIT, Kharagpur GATE 2022

unacademy
05

An art gallery engages a security guard to ensure that the items displayed are protected. The diagram below represents the plan of the gallery where the boundary walls are opaque. The location the security guard posted is identified such that all the inner space (shaded region in the plan) of the gallery is within the line of sight of the security guard.

If the security guard does not move around the posted location and has a 360° view, which one of the following correctly represents the set of ALL possible locations among the locations P, Q, R and S, where the security guard can be posted to watch over the entire inner space of the gallery.




(A) P and Q

(B) Q

(C) Q and S

(D) R and S

IIT, Kharagpur GATE 2022

unacademy
06

Mosquitoes pose a threat to human health. Controlling mosquitoes using chemicals may have undesired consequences. In Florida, authorities have used genetically modified mosquitoes to control the overall mosquito population. It remains to be seen if this novel approach has unforeseen consequences.

Which one of the following is the correct logical inference based on the information in the above passage?

A. Using chemicals to kill mosquitoes is better than using genetically modified mosquitoes because genetic engineering is dangerous

B. Using genetically modified mosquitoes is better than using chemicals to kill mosquitoes because they do not have any side effects

C. Both using genetically modified mosquitoes and chemicals have undesired consequences and can be dangerous

D. Using chemicals to kill mosquitoes may have undesired consequences but it is not clear if using genetically modified mosquitoes has any negative consequence

IIT, Kharagpur GATE 2022

unacademy

Consider the following inequalities.

(i) $2x - 1 > 7$

(ii) $2x - 9 < 1$

Which one of the following expressions below satisfies the above two inequalities?

A $x \leq -4$

B $-4 < x \leq 4$

C $4 < x < 4$

D x Â 5

IIT, Kharagpur GATE 2022

unacademy
08

unacademy

Four points P(0, 1), Q(0, − 3), R(− 2, − 1), and S(2, − 1) represent the vertices of a quadrilateral. What is the area enclosed by the quadrilateral?

A 4

B $4\sqrt{2}$

C 8

D $8\sqrt{2}$

IIT, Kharagpur GATE 2022

unacademy
09

In a class of five students P, Q, R, S and T, only one student is known to have copied in the exam. The disciplinary committee has investigated the situation and recorded the statements from the students as given below.

Statement of P: R has copied in the exam.

Statement of Q: S has copied in the exam.

Statement of R: P did not copy in the exam.

Statement of S: Only one of us is telling the truth.

Statement of T: R is telling the truth.

The investigating team had authentic information that S never lies.

Based on the information given above, the person who has copied in the exam is

A R

B P

C Q

D T

IIT, Kharagpur GATE 2022

unacademy
10

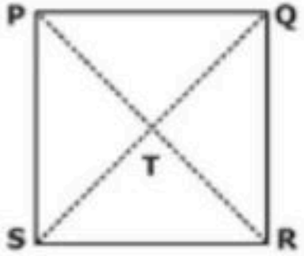
Consider the following square with the four corners and the center marked as P, Q, R, S and T respectively.

Let X, Y and Z represent the following operations:

X: rotation of the square by 180 degree with respect to the S-Q axis.

Y: rotation of the square by 180 degree with respect to the P-R axis.

Z: rotation of the square by 90 degree clockwise with respect to the axis perpendicular, going into the screen and passing through the point T.




Consider the following three distinct sequences of operation (which are applied in the left to right order).

(1) XYZZ

(2) XY

(3) ZZZZ

unacademy

Which one of the following statements is correct as per the information provided above?

A The sequence of operations (1) and (2) are equivalent

B The sequence of operations (1) and (3) are equivalent

C The sequence of operations (2) and (3) are equivalent

D The sequence of operations (1), (2) and (3) are equivalent

IIT, Kharagpur GATE 2022

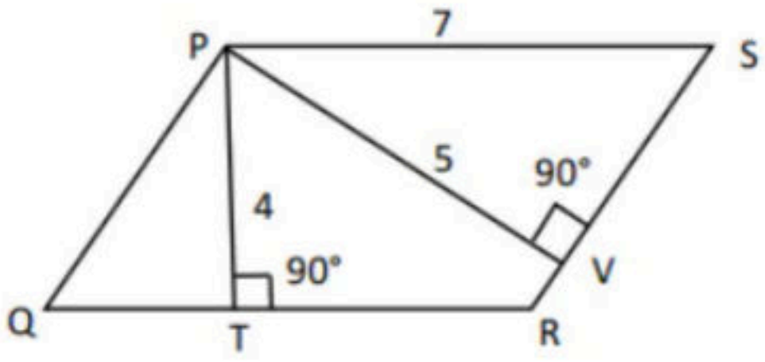
# Chemical Engineering CH 2023

| | |
|---|---|
| Q.1 | "You are delaying the completion of the task. Send _____ contributions at the earliest." |
| | |
| (A) | you are |
| (B) | your |
| (C) | you're |
| (D) | yore |

IIT, Kanpur GATE 2023 (CH)

| | |
|---|---|
| Q.2 | References : _____ : : Guidelines : Implement<br>(By word meaning) |
| | |
| (A) | Sight |
| (B) | Site |
| (C) | Cite |
| (D) | Plagiarise |

IIT, Kanpur GATE 2023 (CH)

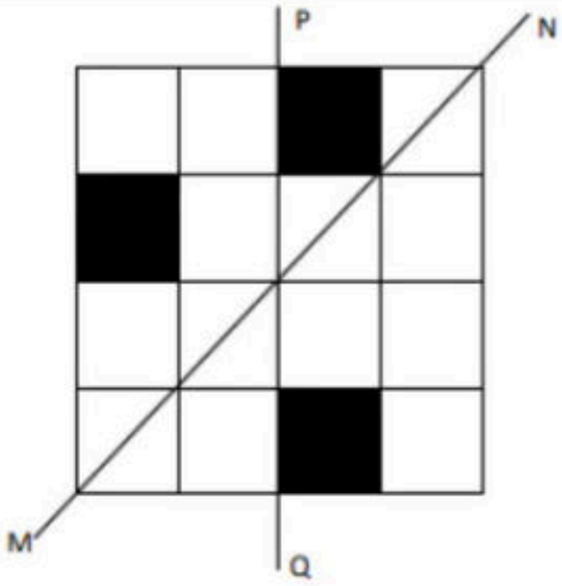
| | |
|---|---|
| Q.3 | In the given figure, PQRS is a parallelogram with PS = 7 cm, PT = 4 cm and PV = 5 cm. What is the length of RS in cm? (The diagram is representative.) |
| |  |
| (A) | $\frac{20}{7}$ |
| (B) | $\frac{28}{5}$ |
| (C) | $\frac{9}{2}$ |
| (D) | $\frac{35}{4}$ |

IIT, Kanpur GATE 2023 (CH)

unacademy

| | |
|---|---|
| Q.4 | In 2022, June Huh was awarded the Fields medal, which is the highest prize in Mathematics.<br><br>When he was younger, he was also a poet. He did not win any medals in the International Mathematics Olympiads. He dropped out of college.<br><br>Based only on the above information, which one of the following statements can be logically inferred with *certainty*? |
| | |
| (A) | Every Fields medalist has won a medal in an International Mathematics Olympiad. |
| (B) | Everyone who has dropped out of college has won the Fields medal. |
| (C) | All Fields medalists are part-time poets. |
| (D) | Some Fields medalists have dropped out of college. |

IIT, Kanpur GATE 2023 (CH)

| | |
|---|---|
| Q.5 | A line of symmetry is defined as a line that divides a figure into two parts in a way such that each part is a mirror image of the other part about that line.<br><br>The given figure consists of 16 unit squares arranged as shown. In addition to the three black squares, what is the minimum number of squares that must be coloured black, such that both PQ and MN form lines of symmetry? (The figure is representative) |
| |  |
| (A) | 3 |
| (B) | 4 |
| (C) | 5 |
| (D) | 6 |

IIT, Kanpur GATE 2023 (CH)

| | |
|---|---|
| Q.6 | Human beings are one among many creatures that inhabit an imagined world. In this imagined world, some creatures are cruel. If in this imagined world, it is given that the statement "Some human beings are not cruel creatures" is FALSE, then which of the following set of statement(s) can be logically inferred with *certainty*?<br><br>(i) All human beings are cruel creatures.<br>(ii) Some human beings are cruel creatures.<br>(iii) Some creatures that are cruel are human beings.<br>(iv) No human beings are cruel creatures. |
| | |
| (A) | only (i) |
| (B) | only (iii) and (iv) |
| (C) | only (i) and (ii) |
| (D) | (i), (ii) and (iii) |

**IIT, Kanpur GATE 2023 (CH)**

unacademy

| | |
|---|---|
| Q.7 | To construct a wall, sand and cement are mixed in the ratio of 3:1. The cost of sand and that of cement are in the ratio of 1:2.<br><br>If the total cost of sand and cement to construct the wall is 1000 rupees, then what is the cost (in rupees) of cement used? |
| | |
| (A) | 400 |
| (B) | 600 |
| (C) | 800 |
| (D) | 200 |

IIT, Kanpur GATE 2023 (CH)

| | |
|---|---|
| Q.8 | The World Bank has declared that it does not plan to offer new financing to Sri Lanka, which is battling its worst economic crisis in decades, until the country has an adequate macroeconomic policy framework in place. In a statement, the World Bank said Sri Lanka needed to adopt structural reforms that focus on economic stabilisation and tackle the root causes of its crisis. The latter has starved it of foreign exchange and led to shortages of food, fuel, and medicines. The bank is repurposing resources under existing loans to help alleviate shortages of essential items such as medicine, cooking gas, fertiliser, meals for children, and cash for vulnerable households.<br><br>Based only on the above passage, which one of the following statements can be inferred with *certainty*? |
| | |
| (A) | According to the World Bank, the root cause of Sri Lanka's economic crisis is that it does not have enough foreign exchange. |
| (B) | The World Bank has stated that it will advise the Sri Lankan government about how to tackle the root causes of its economic crisis. |
| (C) | According to the World Bank, Sri Lanka does not yet have an adequate macroeconomic policy framework. |
| (D) | The World Bank has stated that it will provide Sri Lanka with additional funds for essentials such as food, fuel, and medicines. |

IIT, Kanpur GATE 2023 (CH)

unacademy

| | |
|---|---|
| Q.9 | The coefficient of $x^4$ in the polynomial $(x-1)^3(x-2)^3$ is equal to _____. |
| | |
| (A) | 33 |
| (B) | $-3$ |
| (C) | 30 |
| (D) | 21 |

IIT, Kanpur GATE 2023 (CH)

unacademy

| | |
|---|---|
| Q.10 | Which one of the following shapes can be used to tile (completely cover by repeating) a flat plane, extending to infinity in all directions, without leaving any empty spaces in between them? The copies of the shape used to tile are identical and are not allowed to overlap. |
| | |
| (A) | circle |
| (B) | regular octagon |
| (C) | regular pentagon |
| (D) | rhombus |

IIT, Kanpur GATE 2023 (CH)

# Electrical Engineering (EE) 2023

| | |
|---|---|
| Q.1 | Rafi told Mary, "I am thinking of watching a film this weekend."<br>The following reports the above statement in indirect speech:<br>Rafi told Mary that he _____ of watching a film that weekend. |
| | |
| (A) | thought |
| (B) | is thinking |
| (C) | am thinking |
| (D) | was thinking |

IIT, Kanpur GATE 2023 (EE)

| | |
|---|---|
| Q.2 | Permit : _____ : : Enforce : Relax<br>(By word meaning) |
| | |
| (A) | Allow |
| (B) | Forbid |
| (C) | License |
| (D) | Reinforce |
| | |

IIT, Kanpur GATE 2023 (EE)

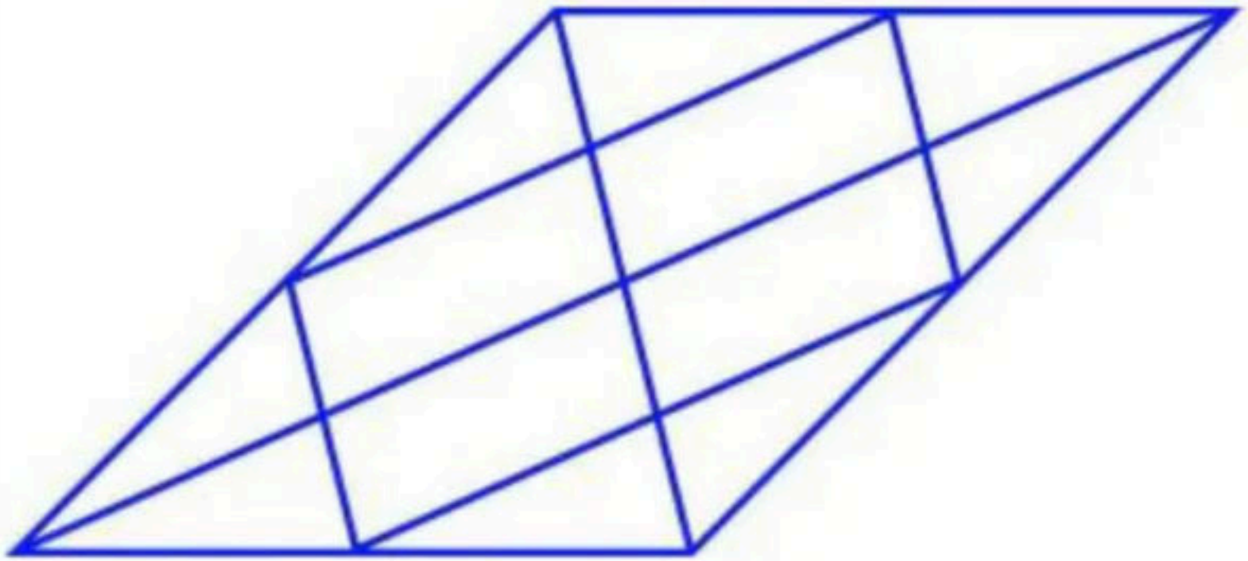
unacademy

| | |
|---|---|
| Q.3 | Given a fair six-faced dice where the faces are labelled '1', '2', '3', '4', '5', and '6', what is the probability of getting a '1' on the first roll of the dice and a '4' on the second roll? |
| | |
| (A) | $\frac{1}{36}$ |
| (B) | $\frac{1}{6}$ |
| (C) | $\frac{5}{6}$ |
| (D) | $\frac{1}{3}$ |

IIT, Kanpur GATE 2023 (EE)

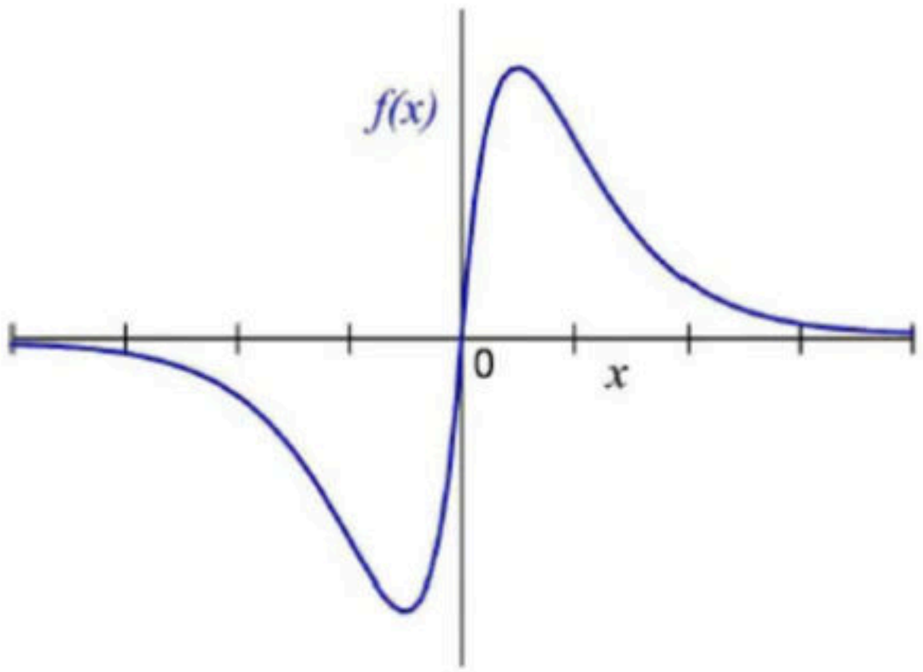
| | |
|---|---|
| Q.4 | A recent survey shows that 65% of tobacco users were advised to stop consuming tobacco. The survey also shows that 3 out of 10 tobacco users attempted to stop using tobacco.<br><br>Based only on the information in the above passage, which one of the following options can be logically inferred with *certainty*? |
| | |
| (A) | A majority of tobacco users who were advised to stop consuming tobacco made an attempt to do so. |
| (B) | A majority of tobacco users who were advised to stop consuming tobacco did not attempt to do so. |
| (C) | Approximately 30% of tobacco users successfully stopped consuming tobacco. |
| (D) | Approximately 65% of tobacco users successfully stopped consuming tobacco. |

IIT, Kanpur GATE 2023 (EE)

| | |
|---|---|
| Q.5 | How many triangles are present in the given figure? |
| |  |
| (A) | 12 |
| (B) | 16 |
| (C) | 20 |
| (D) | 24 |

IIT, Kanpur GATE 2023 (EE)

| | |
|---|---|
| Q.6 | Students of all the departments of a college who have successfully completed the registration process are eligible to vote in the upcoming college elections. However, by the time the due date for registration was over, it was found that suprisingly none of the students from the Department of Human Sciences had completed the registration process.<br><br>Based only on the information provided above, which one of the following sets of statement(s) can be logically inferred with *certainty*?<br><br>(i) All those students who would not be eligible to vote in the college elections would certainly belong to the Department of Human Sciences.<br>(ii) None of the students from departments other than Human Sciences failed to complete the registration process within the due time.<br>(iii) All the eligible voters would certainly be students who are not from the Department of Human Sciences. |
| | |
| (A) | (i) and (ii) |
| (B) | (i) and (iii) |
| (C) | only (i) |
| (D) | only (iii) |

| | |
|---|---|
| Q.7 | Which one of the following options represents the given graph? |
| |  |
| (A) | $f(x)=x^2 2^{-\lvert x\rvert}$ |
| (B) | $f(x)=x\,2^{-\lvert x\rvert}$ |
| (C) | $f(x)=\lvert x\rvert 2^{-x}$ |
| (D) | $f(x)=x\,2^{-x}$ |

IIT, Kanpur GATE 2023 (EE)

| | |
|---|---|
| Q.8 | Which one of the options does NOT describe the passage below or follow from it?<br><br>We tend to think of cancer as a 'modern' illness because its metaphors are so modern. It is a disease of overproduction, of sudden growth, a growth that is unstoppable, tipped into the abyss of no control. Modern cell biology encourages us to imagine the cell as a molecular machine. Cancer is that machine unable to quench its intial command (to grow) and thus transform into an indestructible, self-propelled automaton.<br><br>[Adapted from *The Emperor of All Maladies* by Siddhartha Mukherjee] |
| | |
| (A) | It is a reflection of why cancer seems so modern to most of us. |
| (B) | It tells us that modern cell biology uses and promotes metaphors of machinery. |
| (C) | Modern cell biology encourages metaphors of machinery, and cancer is often imagined as a machine. |
| (D) | Modern cell biology never uses figurative language, such as metaphors, to describe or explain anything. |

IIT, Kanpur GATE 2023 (EE)

unacademy

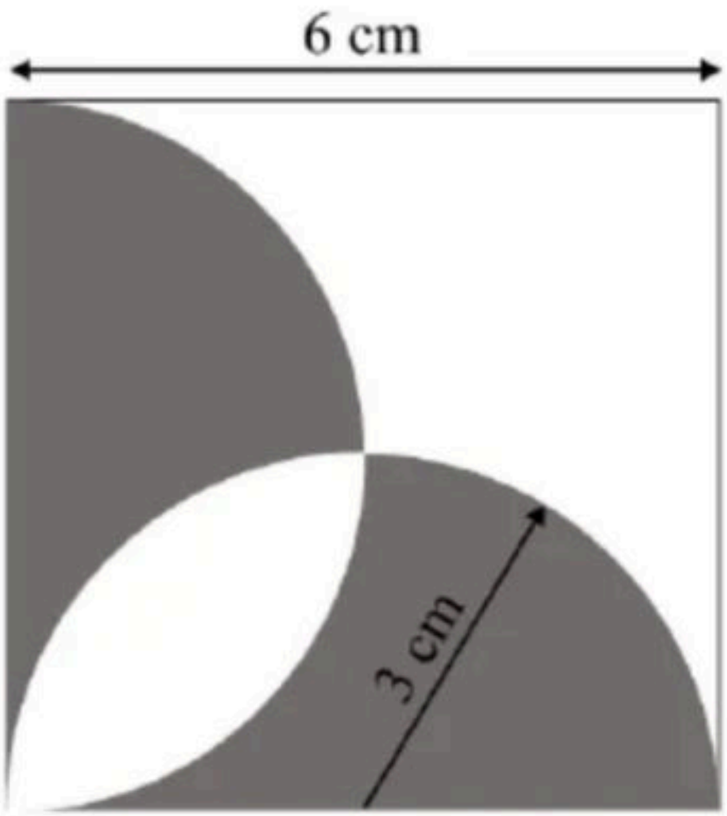
| | |
|---|---|
| Q.9 | The digit in the unit's place of the product $3^{999} \times 7^{1000}$ is _____. |
| | |
| (A) | 7 |
| (B) | 1 |
| (C) | 3 |
| (D) | 9 |

IIT, Kanpur GATE 2023 (EE)

unacademy

Q.10 A square with sides of length 6 cm is given. The boundary of the shaded region is defined by two semi-circles whose diameters are the sides of the square, as shown.

The area of the shaded region is _____ $cm^2$.




| | |
|---|---|
| (A) | $6\pi$ |
| (B) | 18 |
| (C) | 20 |
| (D) | $9\pi$ |

IIT, Kanpur GATE 2023 (EE)

# Instrumentation Engineering IN 2023

unacademy

| | |
|---|---|
| Q.1 | The village was nestled in a green spot, _____ the ocean and the hills. |
| | |
| (A) | through |
| (B) | in |
| (C) | at |
| (D) | between |

IIT, Kanpur GATE 2023 (IN)

| | |
|---|---|
| Q.2 | Disagree : Protest : : Agree : _____<br>(By word meaning) |
| | |
| (A) | Refuse |
| (B) | Pretext |
| (C) | Recommend |
| (D) | Refute |

IIT, Kanpur GATE 2023 (IN)

unacademy

| | |
|---|---|
| Q.3 | A 'frabjous' number is defined as a 3 digit number with all digits odd, and no two adjacent digits being the same. For example, 137 is a frabjous number, while 133 is not. How many such frabjous numbers exist? |
| | |
| (A) | 125 |
| (B) | 720 |
| (C) | 60 |
| (D) | 80 |

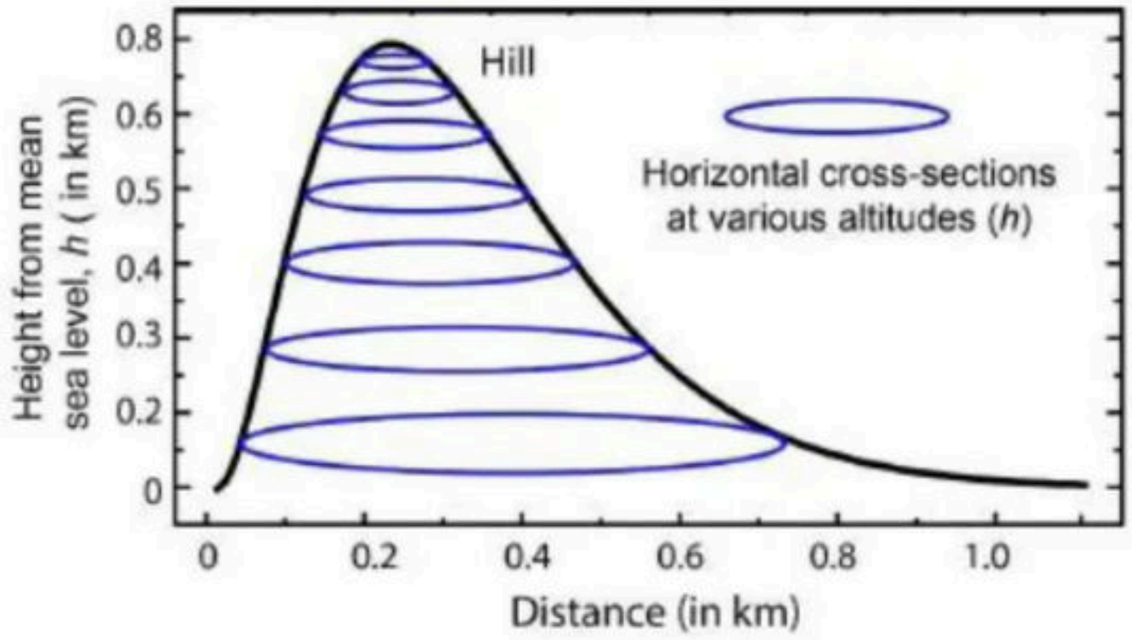
IIT, Kanpur GATE 2023 (IN)

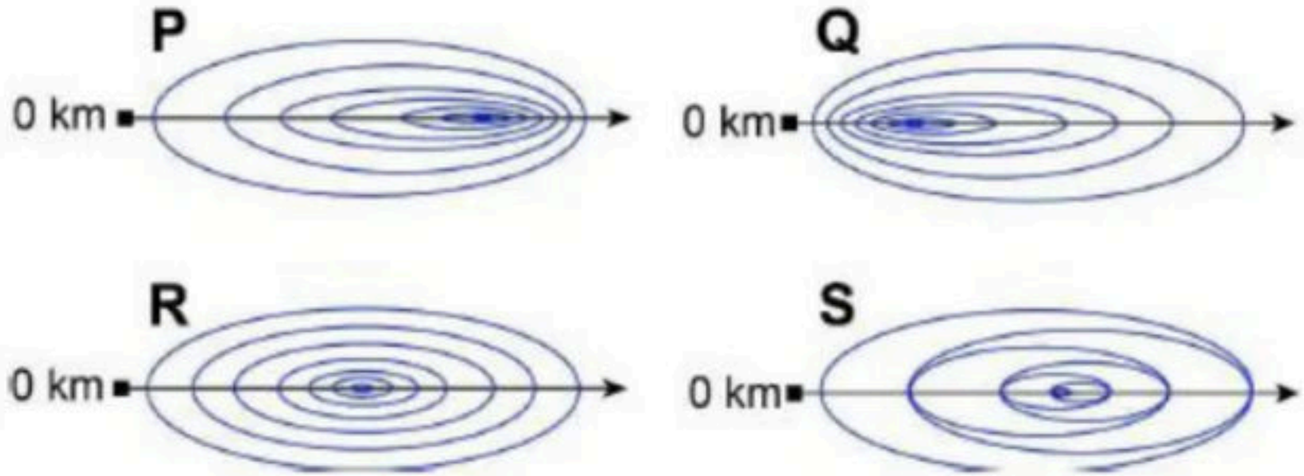
unacademy

| | |
|---|---|
| Q.4 | Which one among the following statements must be TRUE about the mean and the median of the scores of all candidates appearing for GATE 2023? |
| | |
| (A) | The median is at least as large as the mean. |
| (B) | The mean is at least as large as the median. |
| (C) | At most half the candidates have a score that is larger than the median. |
| (D) | At most half the candidates have a score that is larger than the mean. |

IIT, Kanpur GATE 2023 (IN)

Q.5 In the given diagram, ovals are marked at different heights ($h$) of a hill. Which one of the following options P, Q, R, and S depicts the top view of the hill?




| | |
|---|---|
| (A) | P |
| (B) | Q |
| (C) | R |
| (D) | S |

IIT, Kanpur GATE 2023 (IN)

| | |
|---|---|
| Q.6 | Residency is a famous housing complex with many well-established individuals among its residents. A recent survey conducted among the residents of the complex revealed that all of those residents who are well established in their respective fields happen to be academicians. The survey also revealed that most of these academicians are authors of some best-selling books.<br><br>Based only on the information provided above, which one of the following statements can be logically inferred with *certainty*? |
| | |
| (A) | Some residents of the complex who are well established in their fields are also authors of some best-selling books. |
| (B) | All academicians residing in the complex are well established in their fields. |
| (C) | Some authors of best-selling books are residents of the complex who are well established in their fields. |
| (D) | Some academicians residing in the complex are well established in their fields. |

IIT, Kanpur GATE 2023 (IN)

| | |
|---|---|
| Q.7 | Ankita has to climb 5 stairs starting at the ground, while respecting the following rules:<br><br>1. At any stage, Ankita can move either one or two stairs up.<br>2. At any stage, Ankita cannot move to a lower step.<br><br>Let $F(N)$ denote the number of possible ways in which Ankita can reach the $N^{th}$ stair. For example, $F(1) = 1,\ F(2) = 2,\ F(3) = 3$.<br><br>The value of $F(5)$ is _____. |
| | |
| (A) | 8 |
| (B) | 7 |
| (C) | 6 |
| (D) | 5 |

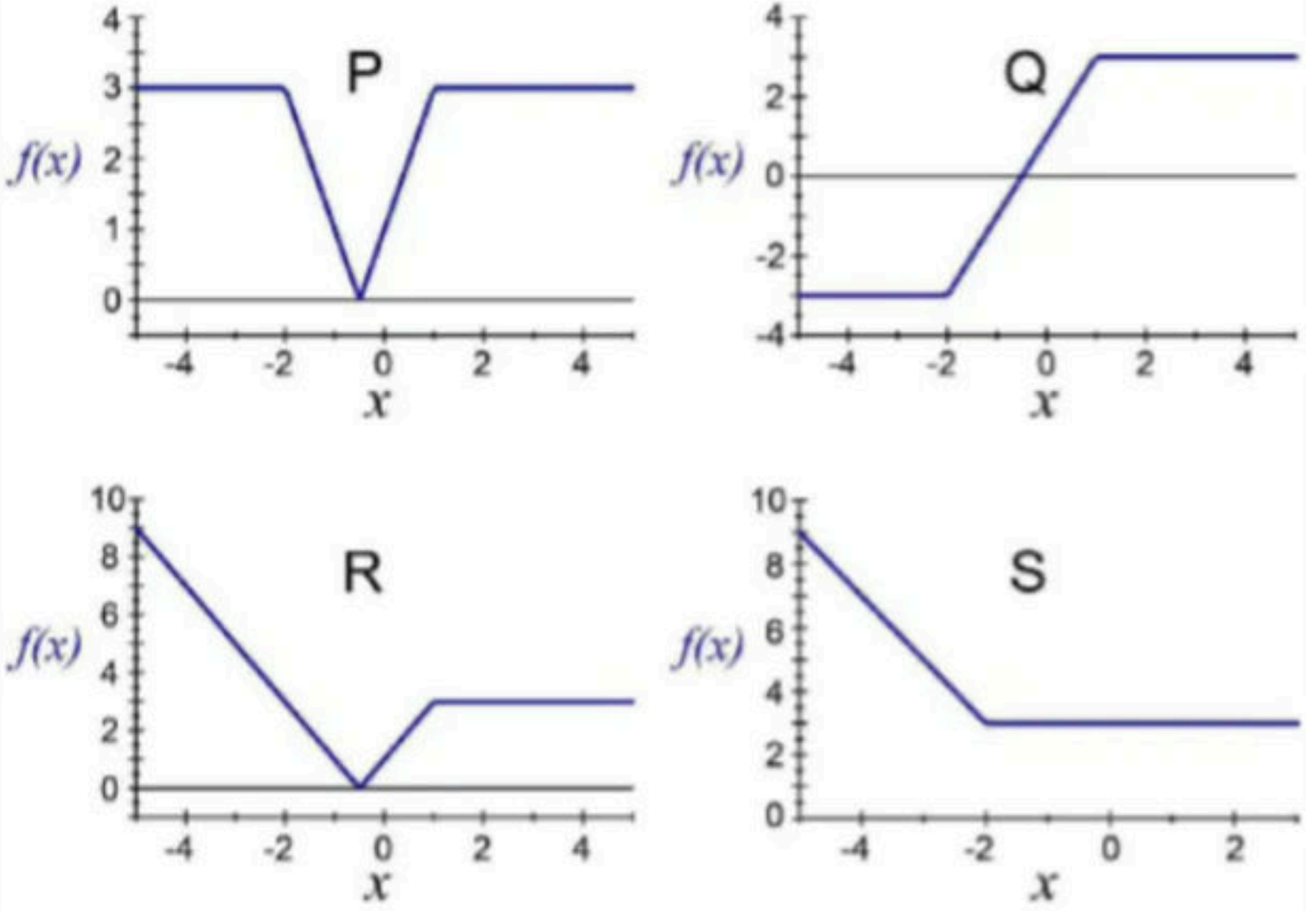
IIT, Kanpur GATE 2023 (IN)

| | |
|---|---|
| Q.8 | The information contained in DNA is used to synthesize proteins that are necessary for the functioning of life. DNA is composed of four nucleotides: Adenine (A), Thymine (T), Cytosine (C), and Guanine (G). The information contained in DNA can then be thought of as a sequence of these four nucleotides: A, T, C, and G. DNA has coding and non-coding regions. Coding regions—where the sequence of these nucleotides are read in groups of three to produce individual amino acids—constitute only about 2% of human DNA. For example, the triplet of nucleotides CCG codes for the amino acid glycine, while the triplet GGA codes for the amino acid proline. Multiple amino acids are then assembled to form a protein.<br><br>Based only on the information provided above, which of the following statements can be logically inferred with *certainty*?<br><br>(i) The majority of human DNA has no role in the synthesis of proteins.<br>(ii) The function of about 98% of human DNA is not understood. |
| | |
| (A) | only (i) |
| (B) | only (ii) |
| (C) | both (i) and (ii) |
| (D) | neither (i) nor (ii) |

IIT, Kanpur GATE 2023 (IN)

Q.9 Which one of the given figures P, Q, R and S represents the graph of the following function?

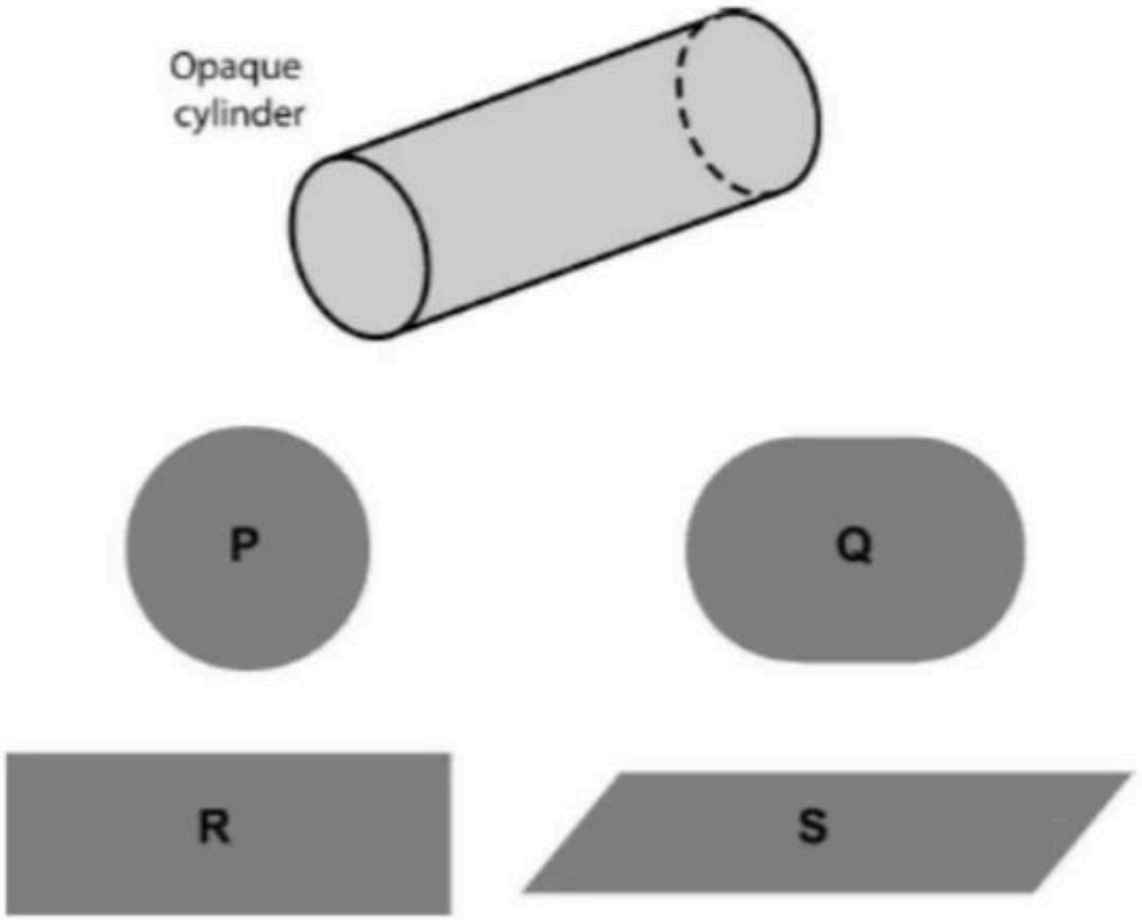
$$f(x) = \left| \, |x+2| - |x-1| \, \right|$$




| | |
|---|---|
| (A) | P |
| (B) | Q |
| (C) | R |
| (D) | S |

IIT, Kanpur GATE 2023 (IN)

| | |
|---|---|
| Q.10 | An opaque cylinder (shown below) is suspended in the path of a parallel beam of light, such that its shadow is cast on a screen oriented perpendicular to the direction of the light beam. The cylinder can be reoriented in any direction within the light beam. Under these conditions, which one of the shadows P, Q, R, and **S** is NOT possible? |




| | |
|---|---|
| (A) | **P** |
| (B) | **Q** |
| (C) | **R** |
| (D) | **S** |

**IIT, Kanpur GATE 2023 (IN)**

# Mechanical Engineering ME 2023

unacademy

| | |
|---|---|
| Q.1 | He did not manage to fix the car himself, so he _____ in the garage. |
| | |
| (A) | got it fixed |
| (B) | getting it fixed |
| (C) | gets fixed |
| (D) | got fixed |

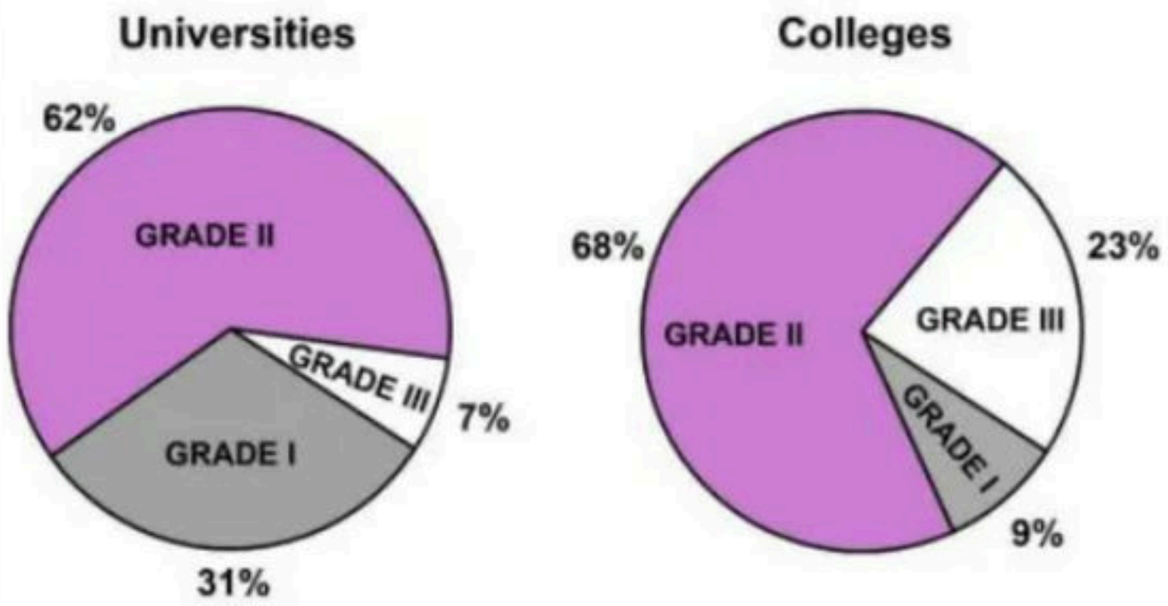
IIT, Kanpur GATE 2023 (ME)

unacademy

| | |
|---|---|
| Q.2 | Planting : Seed : : Raising : _____<br>(By word meaning) |
| | |
| (A) | Child |
| (B) | Temperature |
| (C) | Height |
| (D) | Lift |

IIT, Kanpur GATE 2023 (ME)

| | |
|---|---|
| Q.3 | A certain country has 504 universities and 25951 colleges. These are categorised into Grades I, II, and III as shown in the given pie charts.<br><br>What is the percentage, correct to one decimal place, of higher education institutions (colleges and universities) that fall into Grade III? |




| | |
|---|---|
| (A) | 22.7 |
| (B) | 23.7 |
| (C) | 15.0 |
| (D) | 66.8 |

IIT, Kanpur GATE 2023 (ME)

unacademy

| | |
|---|---|
| Q.4 | The minute-hand and second-hand of a clock cross each other _____ times between 09:15:00 AM and 09:45:00 AM on a day. |
| | |
| (A) | 30 |
| (B) | 15 |
| (C) | 29 |
| (D) | 31 |

IIT, Kanpur GATE 2023 (ME)

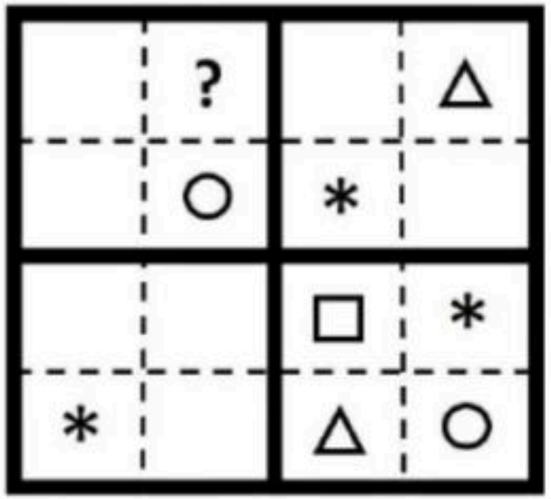
unacademy

Q.5 The symbols ○, ∗, △, and □ are to be filled, one in each box, as shown below.

The rules for filling in the four symbols are as follows.

1) Every row and every column must contain each of the four symbols.
2) Every 2×2 square delineated by bold lines must contain each of the four symbols.

Which symbol will occupy the box marked with '?' in the partially filled figure?




| | |
|---|---|
| (A) | ○ |
| (B) | ∗ |
| (C) | △ |
| (D) | □ |

IIT, Kanpur GATE 2023 (ME)

| | |
|---|---|
| Q.6 | In a recently held parent-teacher meeting, the teachers had very few complaints about Ravi. After all, Ravi was a hardworking and kind student. Incidentally, almost all of Ravi's friends at school were hardworking and kind too. But the teachers drew attention to Ravi's complete lack of interest in sports. The teachers believed that, along with some of his friends who showed similar disinterest in sports, Ravi needed to engage in some sports for his overall development.<br><br>Based only on the information provided above, which one of the following statements can be logically inferred with *certainty*? |
| | |
| (A) | All of Ravi's friends are hardworking and kind. |
| (B) | No one who is not a friend of Ravi is hardworking and kind. |
| (C) | None of Ravi's friends are interested in sports. |
| (D) | Some of Ravi's friends are hardworking and kind. **IIT, Kanpur GATE 2023 (ME)** |

| | |
|---|---|
| Q.7 | Consider the following inequalities<br>$$p^2 - 4q < 4$$<br>$$3p + 2q < 6$$<br>where $p$ and $q$ are positive integers.<br>The value of $(p + q)$ is _____. |
| | |
| (A) | 2 |
| (B) | 1 |
| (C) | 3 |
| (D) | 4 |

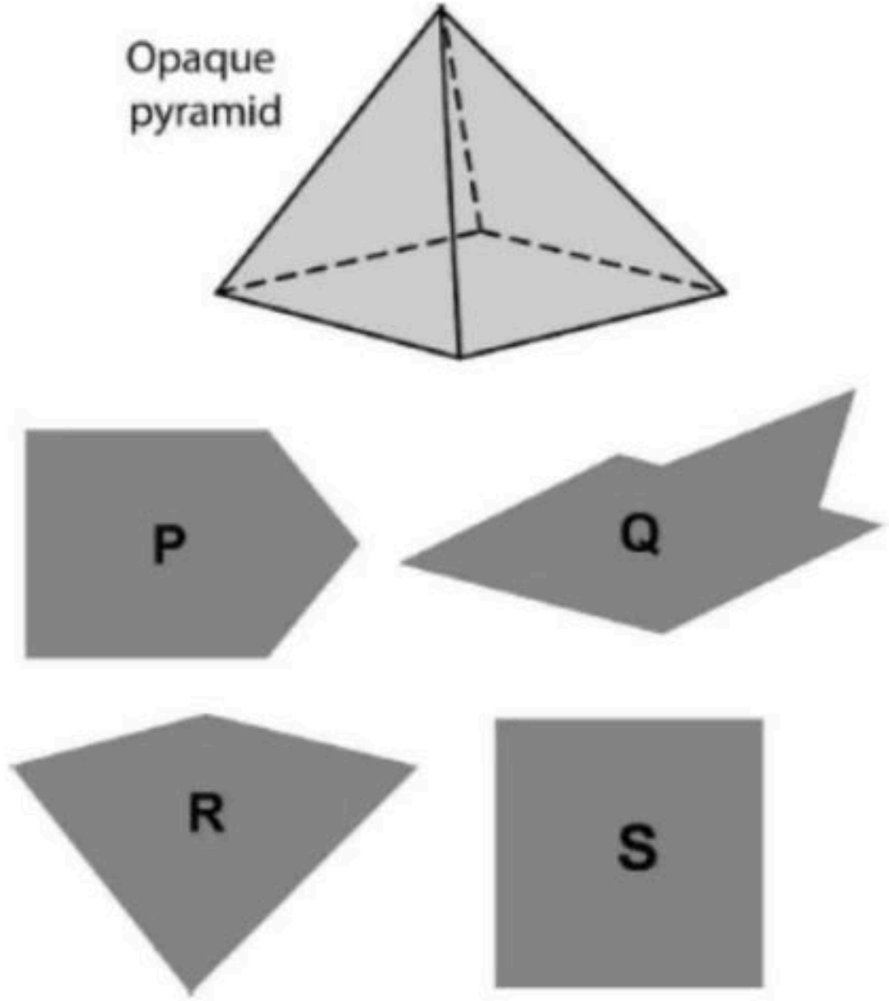
IIT, Kanpur GATE 2023 (ME)

| | |
|---|---|
| Q.8 | Which one of the sentence sequences in the given options creates a coherent narrative?<br><br>(i) I could not bring myself to knock.<br>(ii) There was a murmur of unfamiliar voices coming from the big drawing room and the door was firmly shut.<br>(iii) The passage was dark for a bit, but then it suddenly opened into a bright kitchen.<br>(iv) I decided I would rather wander down the passage. |
| | |
| (A) | (iv), (i), (iii), (ii) |
| (B) | (iii), (i), (ii), (iv) |
| (C) | (ii), (i), (iv), (iii) |
| (D) | (i), (iii), (ii), (iv) **IIT, Kanpur GATE 2023 (ME)** |

| | |
|---|---|
| Q.9 | How many pairs of sets (S,T) are possible among the subsets of {1, 2, 3, 4, 5, 6} that satisfy the condition that S is a subset of T? |
| | |
| (A) | 729 |
| (B) | 728 |
| (C) | 665 |
| (D) | 664 |

IIT, Kanpur GATE 2023 (ME)

| | |
|---|---|
| Q.10 | An opaque pyramid (shown below), with a square base and isosceles faces, is suspended in the path of a parallel beam of light, such that its shadow is cast on a screen oriented perpendicular to the direction of the light beam. The pyramid can be reoriented in any direction within the light beam. Under these conditions, which one of the shadows P, Q, R, and **S** is NOT possible? |




| | |
|---|---|
| (A) | **P** |
| (B) | **Q** |
| (C) | **R** |
| (D) | **S** |

**IIT, Kanpur GATE 2023 (ME)**

# Civil Engineering CE Set 01 - 2023

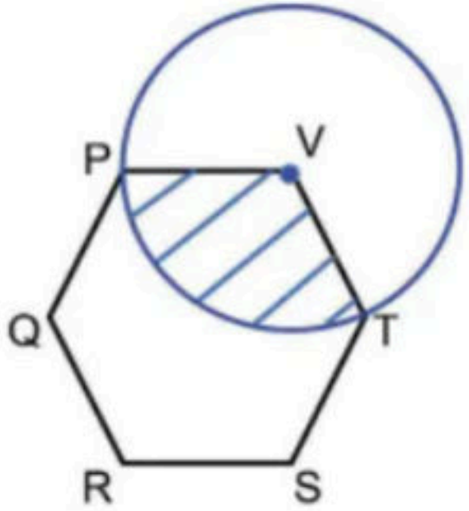
unacademy

| | |
|---|---|
| Q.1 | "I have not yet decided what I will do this evening; I _____ visit a friend." |
| | |
| (A) | mite |
| (B) | would |
| (C) | might |
| (D) | didn't |

IIT, Kanpur GATE 2023 (CE - I)

| | |
|---|---|
| Q.2 | Eject : Insert : : Advance : _____<br>(By word meaning) |
| | |
| (A) | Advent |
| (B) | Progress |
| (C) | Retreat |
| (D) | Loan |

IIT, Kanpur GATE 2023 (CE - I)

| | |
|---|---|
| Q.3 | In the given figure, PQRSTV is a regular hexagon with each side of length 5 cm. A circle is drawn with its centre at V such that it passes through P. What is the area (in $cm^2$) of the shaded region? (The diagram is representative) |
| |  |
| (A) | $\frac{25\pi}{3}$ |
| (B) | $\frac{20\pi}{3}$ |
| (C) | $6\pi$ |
| (D) | $7\pi$ |

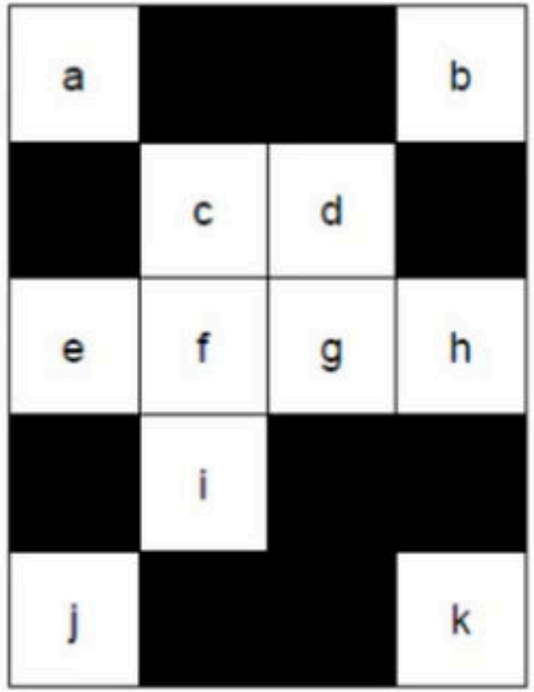
IIT, Kanpur GATE 2023 (CE - I)

| | |
|---|---|
| Q.4 | A duck named Donald Duck says "All ducks always lie."<br><br>Based only on the information above, which one of the following statements can be logically inferred with *certainty*? |
| | |
| (A) | Donald Duck always lies. |
| (B) | Donald Duck always tells the truth. |
| (C) | Donald Duck's statement is true. |
| (D) | Donald Duck's statement is false. |

IIT, Kanpur GATE 2023 (CE - I)

Q.5 A line of symmetry is defined as a line that divides a figure into two parts in a way such that each part is a mirror image of the other part about that line.

The figure below consists of 20 unit squares arranged as shown. In addition to the given black squares, upto 5 more may be coloured black. Which one among the following options depicts the minimum number of boxes that must be coloured black to achieve two lines of symmetry? (The figure is representative)



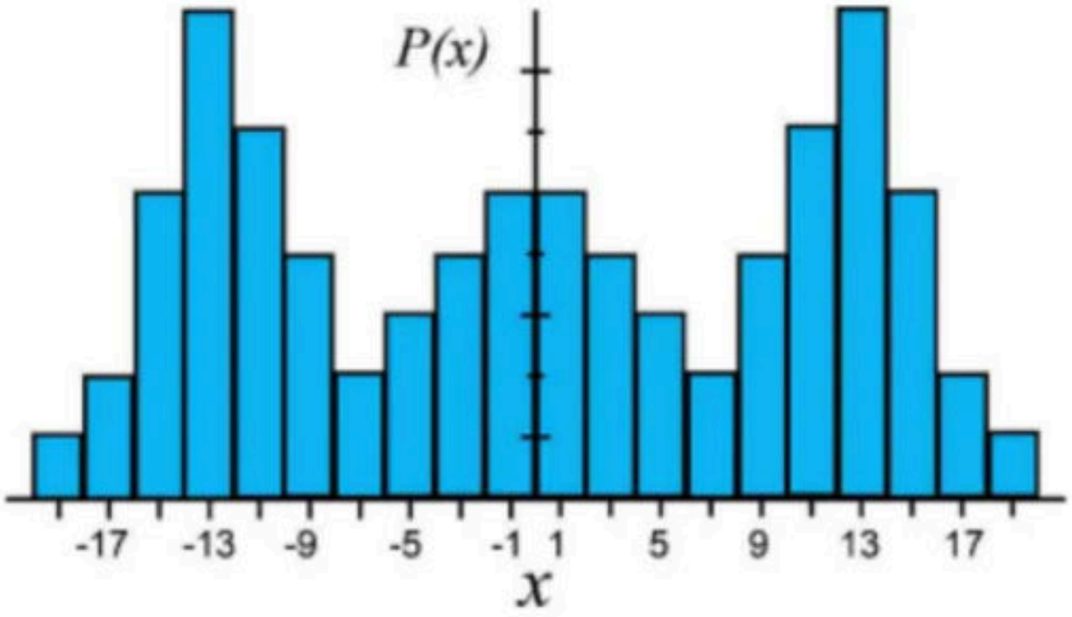

| | |
|---|---|
| (A) | d |
| (B) | c, d, i |
| (C) | c, i |
| (D) | c, d, i, f, g |

IIT, Kanpur GATE 2023 (CE - I)

unacademy

| | |
|---|---|
| Q.6 | Based only on the truth of the statement 'Some humans are intelligent', which one of the following options can be logically inferred with *certainty*? |
| | |
| (A) | No human is intelligent. |
| (B) | All humans are intelligent. |
| (C) | Some non-humans are intelligent. |
| (D) | Some intelligent beings are humans. |

IIT, Kanpur GATE 2023 (CE - I)

| | |
|---|---|
| Q.7 | Which one of the options can be inferred about the mean, median, and mode for the given probability distribution (*i.e.* probability mass function), $P(x)$, of a variable $x$? |
| |   |
| (A) | mean = median ≠ mode |
| (B) | mean = median = mode |
| (C) | mean ≠ median = mode |
| (D) | mean ≠ mode = median |

IIT, Kanpur GATE 2023 (CE - I)

| | |
|---|---|
| Q.8 | The James Webb telescope, recently launched in space, is giving humankind unprecedented access to the depths of time by imaging very old stars formed almost 13 billion years ago. Astrophysicists and cosmologists believe that this odyssey in space may even shed light on the existence of dark matter. Dark matter is supposed to interact only via the gravitational interaction and not through the electromagnetic-, the weak- or the strong-interaction. This may justify the epithet "dark" in dark matter.<br><br>Based on the above paragraph, which one of the following statements is FALSE? |
| | |
| (A) | No other telescope has captured images of stars older than those captured by the James Webb telescope. |
| (B) | People other than astrophysicists and cosmologists may also believe in the existence of dark matter. |
| (C) | The James Webb telescope could be of use in the research on dark matter. |
| (D) | If dark matter was known to interact via the strong-interaction, then the epithet "dark" would be justified. |

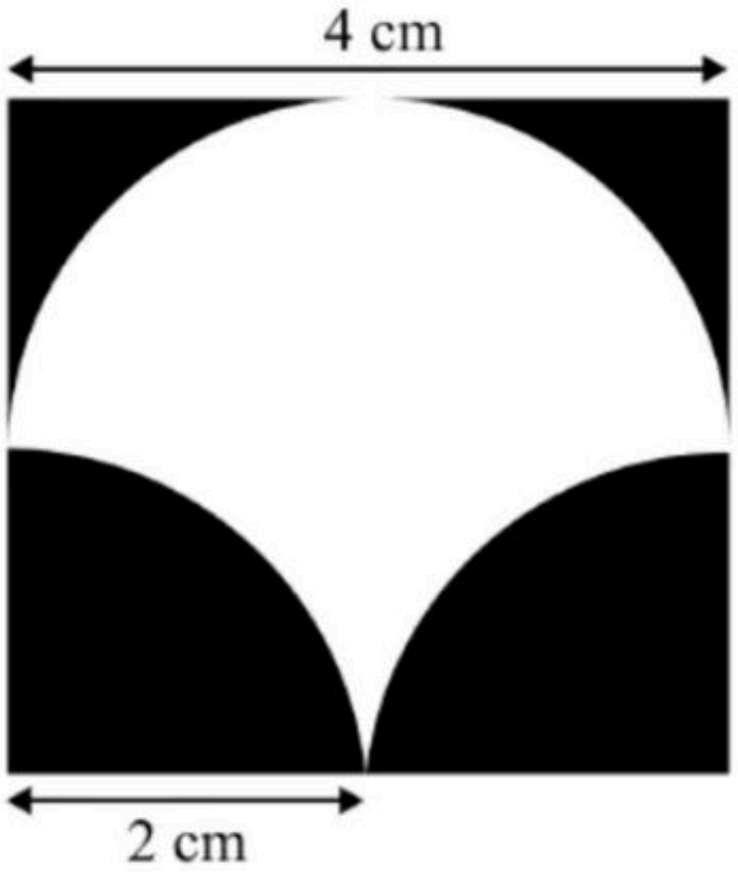
IIT, Kanpur GATE 2023 (CE - I)

unacademy

| | |
|---|---|
| Q.9 | Let $a = 30!$, $b = 50!$, and $c = 100!$. Consider the following numbers: $\log_a c, \quad \log_c a, \quad \log_b a, \quad \log_a b$ Which one of the following inequalities is CORRECT? |
| | |
| (A) | $\log_c a < \log_b a < \log_a b < \log_a c$ |
| (B) | $\log_c a < \log_a b < \log_b a < \log_b c$ |
| (C) | $\log_c a < \log_b a < \log_a c < \log_a b$ |
| (D) | $\log_b a < \log_c a < \log_a b < \log_a c$ |

IIT, Kanpur GATE 2023 (CE - I)

| | |
|---|---|
| Q.10 | A square of side length 4 cm is given. The boundary of the shaded region is defined by one semi-circle on the top and two circular arcs at the bottom, each of radius 2 cm, as shown.<br><br>The area of the shaded region is _____ $cm^2$. |




| | |
|---|---|
| (A) | 8 |
| (B) | 4 |
| (C) | 12 |
| (D) | 10 |

IIT, Kanpur GATE 2023 (CE - I)

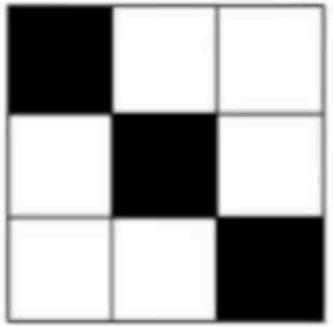
# Civil Engineering CE Set 02 - 2023

| | |
|---|---|
| Q.1 | The line ran _____ the page, right through the centre, and divided the page into two. |
| | |
| (A) | across |
| (B) | of |
| (C) | between |
| (D) | about |

IIT, Kanpur GATE 2023 (CE - II)

unacademy

| | |
|---|---|
| Q.2 | Kind : _____ : : Often : Seldom<br><br>(By word meaning) |
| | |
| (A) | Cruel |
| (B) | Variety |
| (C) | Type |
| (D) | Kindred |

| | |
|---|---|
| Q.3 | In how many ways can cells in a $3 \times 3$ grid be shaded, such that each row and each column have exactly one shaded cell? An example of one valid shading is shown. |
| |  |
| (A) | 2 |
| (B) | 9 |
| (C) | 3 |
| (D) | 6 |

IIT, Kanpur GATE 2023 (CE - II)

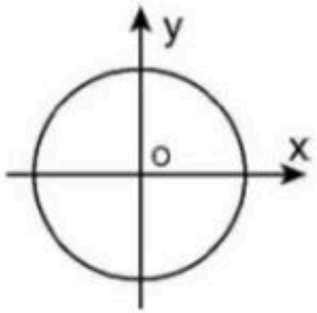
| | |
|---|---|
| Q.4 | There are 4 red, 5 green, and 6 blue balls inside a box. If $N$ number of balls are picked simultaneously, what is the smallest value of $N$ that guarantees there will be at least two balls of the same colour?<br><br>One cannot see the colour of the balls until they are picked. |
| | |
| (A) | 4 |
| (B) | 15 |
| (C) | 5 |
| (D) | 2 |

IIT, Kanpur GATE 2023 (CE - II)

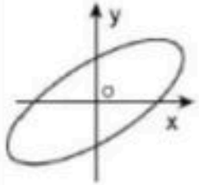
Q.5 Consider a circle with its centre at the origin (O), as shown. Two operations are allowed on the circle.

*Operation 1*: Scale independently along the x and y axes.
*Operation 2*: Rotation in any direction about the origin.

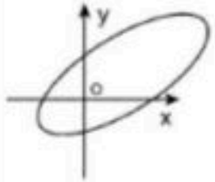
Which figure among the options can be achieved through a combination of these two operations on the given circle?



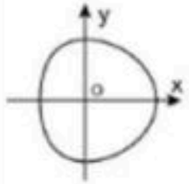

(A)



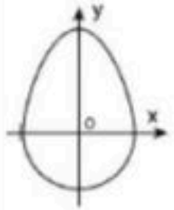

(B)




(C)




(D)




IIT, Kanpur GATE 2023 (CE - II)

| | |
|---|---|
| Q.6 | Elvesland is a country that has peculiar beliefs and practices. They express almost all their emotions by gifting flowers. For instance, if anyone gifts a white flower to someone, then it is always taken to be a declaration of one's love for that person. In a similar manner, the gifting of a yellow flower to someone often means that one is angry with that person.<br><br>Based only on the information provided above, which one of the following sets of statement(s) can be logically inferred with *certainty*?<br><br>(i) In Elvesland, one always declares one's love by gifting a white flower.<br><br>(ii) In Elvesland, all emotions are declared by gifting flowers.<br><br>(iii) In Elvesland, sometimes one expresses one's anger by gifting a flower that is not yellow.<br><br>(iv) In Elvesland, sometimes one expresses one's love by gifting a white flower. |
| | |
| (A) | only (ii) |
| (B) | (i), (ii) and (iii) |
| (C) | (i), (iii) and (iv) |
| (D) | only (iv) |

unacademy

| | |
|---|---|
| Q.7 | Three husband-wife pairs are to be seated at a circular table that has six identical chairs. Seating arrangements are defined only by the relative position of the people. How many seating arrangements are possible such that every husband sits next to his wife? |
| | |
| (A) | 16 |
| (B) | 4 |
| (C) | 120 |
| (D) | 720 |

IIT, Kanpur GATE 2023 (CE - II)

| | |
|---|---|
| Q.8 | Based only on the following passage, which one of the options can be inferred with *certainty*?<br><br>When the congregation sang together, Apenyo would also join, though her little screams were not quite audible because of the group singing. But whenever there was a special number, trouble would begin; Apenyo would try singing along, much to the embarrassment of her mother. After two or three such mortifying Sunday evenings, the mother stopped going to church altogether until Apenyo became older and learnt to behave.<br><br>At home too, Apenyo never kept quiet; she hummed or made up silly songs to sing by herself, which annoyed her mother at times but most often made her become pensive. She was by now convinced that her daughter had inherited her love of singing from her father who had died unexpectedly away from home.<br><br>[Excerpt from *These Hills Called Home* by Temsula Ao] |
| | |
| (A) | The mother was embarrassed about her daughter's singing at home. |
| (B) | The mother's feelings about her daughter's singing at home were only of annoyance. |
| (C) | The mother was not sure if Apenyo had inherited her love of singing from her father. |
| (D) | When Apenyo hummed at home, her mother tended to become thoughtful. |

IIT, Kanpur GATE 2023 (CE - II)

| | |
|---|---|
| Q.9 | If $x$ satisfies the equation $4^{8^x} = 256$, then $x$ is equal to _____. |
| | |
| (A) | $\frac{1}{2}$ |
| (B) | $\log_{16} 8$ |
| (C) | $\frac{2}{3}$ |
| (D) | $\log_4 8$ |

IIT, Kanpur GATE 2023 (CE - II)

| | |
|---|---|
| Q.10 | Consider a spherical globe rotating about an axis passing through its poles. There are three points $P$, $Q$, and $R$ situated respectively on the equator, the north pole, and midway between the equator and the north pole in the northern hemisphere. Let $P$, $Q$, and $R$ move with speeds $v_P$, $v_Q$, and $v_R$, respectively.<br><br>Which one of the following options is CORRECT? |
| | |
| (A) | $v_P < v_R < v_Q$ |
| (B) | $v_P < v_Q < v_R$ |
| (C) | $v_P > v_R > v_Q$ |
| (D) | $v_P = v_R \neq v_Q$ |

IIT, Kanpur GATE 2023 (CE - II)

# Computer Science and Information Technology (CS) 2023

unacademy

| | |
|---|---|
| Q.1 | We reached the station late, and _____ missed the train. |
| | |
| (A) | near |
| (B) | nearly |
| (C) | utterly |
| (D) | mostly |

IIT, Kanpur GATE 2023 (CS)

unacademy

| | |
|---|---|
| Q.2 | Kind : _____ : : Often : Frequently<br><br>(By word meaning) |
| | |
| (A) | Mean |
| (B) | Type |
| (C) | Cruel |
| (D) | Kindly |

IIT, Kanpur GATE 2023 (CS)

| | |
|---|---|
| Q.3 | A series of natural numbers $F_1,\ F_2,\ F_3,\ F_4,\ F_5,\ F_6,\ F_7, \ldots$ obeys $F_{n+1} = F_n + F_{n-1}$ for all integers $n \geq 2$ .<br><br>If $F_6 = 37$, and $F_7 = 60$, then what is $F_1$ ? |
| | |
| (A) | 4 |
| (B) | 5 |
| (C) | 8 |
| (D) | 9 |

IIT, Kanpur GATE 2023 (CS)

| | |
|---|---|
| Q.4 | A survey for a certain year found that 90% of pregnant women received medical care at least once before giving birth. Of these women, 60% received medical care from doctors, while 40% received medical care from other healthcare providers.<br><br>Given this information, which one of the following statements can be inferred with *certainty*? |
| | |
| (A) | More than half of the pregnant women received medical care at least once from a doctor. |
| (B) | Less than half of the pregnant women received medical care at least once from a doctor. |
| (C) | More than half of the pregnant women received medical care at most once from a doctor. |
| (D) | Less than half of the pregnant women received medical care at most once from a doctor. |

IIT, Kanpur GATE 2023 (CS)

unacademy

| | |
|---|---|
| Q.5 | Looking at the surface of a smooth 3-dimensional object from the outside, which one of the following options is TRUE? |
| | |
| (A) | The surface of the object must be concave everywhere. |
| (B) | The surface of the object must be convex everywhere. |
| (C) | The surface of the object may be concave in some places and convex in other places. |
| (D) | The object can have edges, but no corners. |

IIT, Kanpur GATE 2023 (CS)

| | |
|---|---|
| Q.6 | The country of Zombieland is in distress since more than 75% of its working population is suffering from serious health issues. Studies conducted by competent health experts concluded that a complete lack of physical exercise among its working population was one of the leading causes of their health issues. As one of the measures to address the problem, the Government of Zombieland has decided to provide monetary incentives to those who ride bicycles to work.<br><br>Based only on the information provided above, which one of the following statements can be logically inferred with *certainty*? |
| | |
| (A) | All the working population of Zombieland will henceforth ride bicycles to work. |
| (B) | Riding bicycles will ensure that all of the working population of Zombieland is free of health issues. |
| (C) | The health experts suggested to the Government of Zombieland to declare riding bicycles as mandatory. |
| (D) | The Government of Zombieland believes that riding bicycles is a form of physical exercise. |

IIT, Kanpur GATE 2023 (CS)

| | |
|---|---|
| Q.7 | Consider two functions of time $(t)$,<br>$$f(t) = 0.01\,t^2$$<br>$$g(t) = 4\,t$$<br>where $0 < t < \infty$.<br>Now consider the following two statements:<br>(i) For some $t > 0$, $g(t) > f(t)$.<br>(ii) There exists a $T$, such that $f(t) > g(t)$ for all $t > T$.<br>Which one of the following options is TRUE? |
| | |
| (A) | only (i) is correct |
| (B) | only (ii) is correct |
| (C) | both (i) and (ii) are correct |
| (D) | neither (i) nor (ii) is correct |

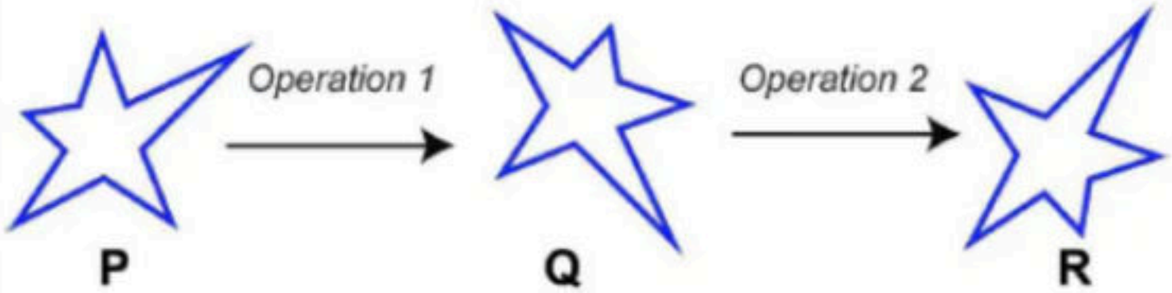
IIT, Kanpur GATE 2023 (CS)

| | |
|---|---|
| Q.8 | Which one of the following sentence sequences creates a coherent narrative?<br><br>(i) Once on the terrace, on her way to her small room in the corner, she notices the man right away.<br>(ii) She begins to pant by the time she has climbed all the stairs.<br>(iii) Mina has bought vegetables and rice at the market, so her bags are heavy.<br>(iv) He was leaning against the parapet, watching the traffic below. |
| | |
| (A) | (i), (ii), (iv), (iii) |
| (B) | (ii), (iii), (i), (iv) |
| (C) | (iv), (ii), (i), (iii) |
| (D) | (iii), (ii), (i), (iv) |

IIT, Kanpur GATE 2023 (CS)

| | |
|---|---|
| Q.9 | $f(x)$ and $g(y)$ are functions of $x$ and $y$, respectively, and $f(x)=g(y)$ for all real values of $x$ and $y$. Which one of the following options is *necessarily* TRUE for all $x$ and $y$? |
| | |
| (A) | $f(x)=0$ and $g(y)=0$ |
| (B) | $f(x)=g(y)=$ constant |
| (C) | $f(x)\neq$ constant and $g(y)\neq$ constant |
| (D) | $f(x)+g(y)=f(x)-g(y)$ |

IIT, Kanpur GATE 2023 (CS)

| | |
|---|---|
| Q.10 | Which one of the options best describes the transformation of the 2-dimensional figure P to Q, and then to R, as shown? |
| |  |
| (A) | *Operation 1*: A clockwise rotation by 90° about an axis perpendicular to the plane of the figure<br><br>*Operation 2*: A reflection along a horizontal line |
| (B) | *Operation 1*: A counter clockwise rotation by 90° about an axis perpendicular to the plane of the figure<br><br>*Operation 2*: A reflection along a horizontal line |
| (C) | *Operation 1*: A clockwise rotation by 90° about an axis perpendicular to the plane of the figure<br><br>*Operation 2*: A reflection along a vertical line |
| (D) | *Operation 1*: A counter clockwise rotation by 180° about an axis perpendicular to the plane of the figure<br><br>*Operation 2*: A reflection along a vertical line |

IIT, Kanpur GATE 2023 (CS)

unacademy

unacademy

unacademy
01

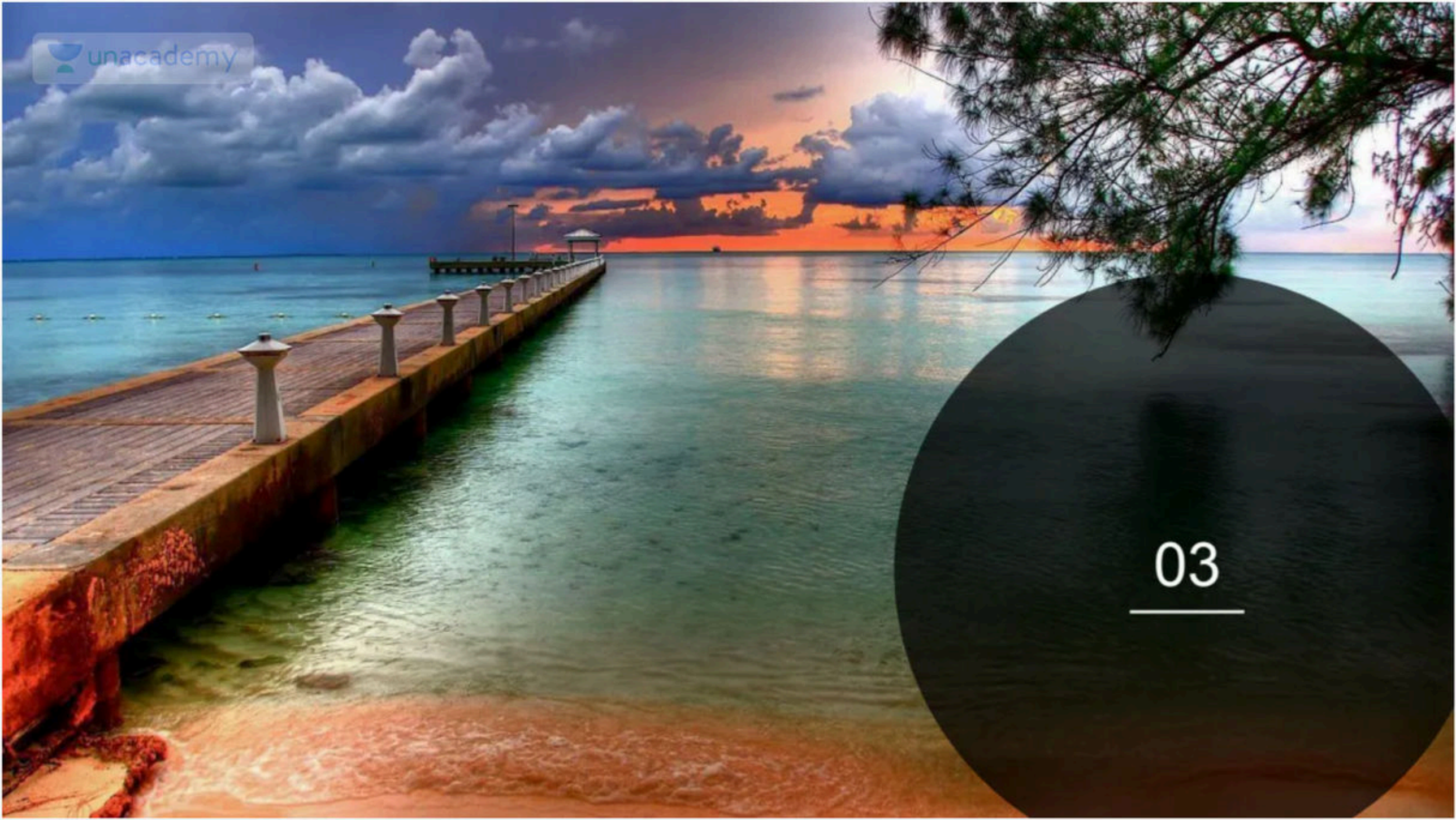
Using the digits : 1,2,3,4 and 5 how many three digit numbers can be formed :

(A) Repetition allowed.
(B) Repetition not allowed.

unacademy
02

Using the digits : 0,1,2,3,4 and 5 how many three digit numbers can be formed :

(A) Repetition allowed.
(B) Repetition not allowed.


unacademy
03

How many four digit numbers can be formed with the 10 digits 0, 1, 2, ..... 9 if no number can start with 0 and if repetitions are not allowed?

**[GATE 2015 : IIT Kanpur (CE Set - 2)]**

unacademy
04

How many numbers between 0 and 1 million can be formed using 0, 7 and 8?

(A) 486 (B) 1086
(C) 728 (D) 900

[GATE 2014 : IIT Kharagpur]

unacademy
05

How many 3 digit no. are there from100 – 1000

(A) All three digits prime and distinct.
(B) All 3 digits odd.

unacademy
06

Using the digits : 1,2,3,4 and 5 how many three digit numbers can be formed , such that it must have :

(A) Exactly one 5
(B) Eaxactly two 5
(C) At least one 5

© JENNY E. ROSS
unacademy
07

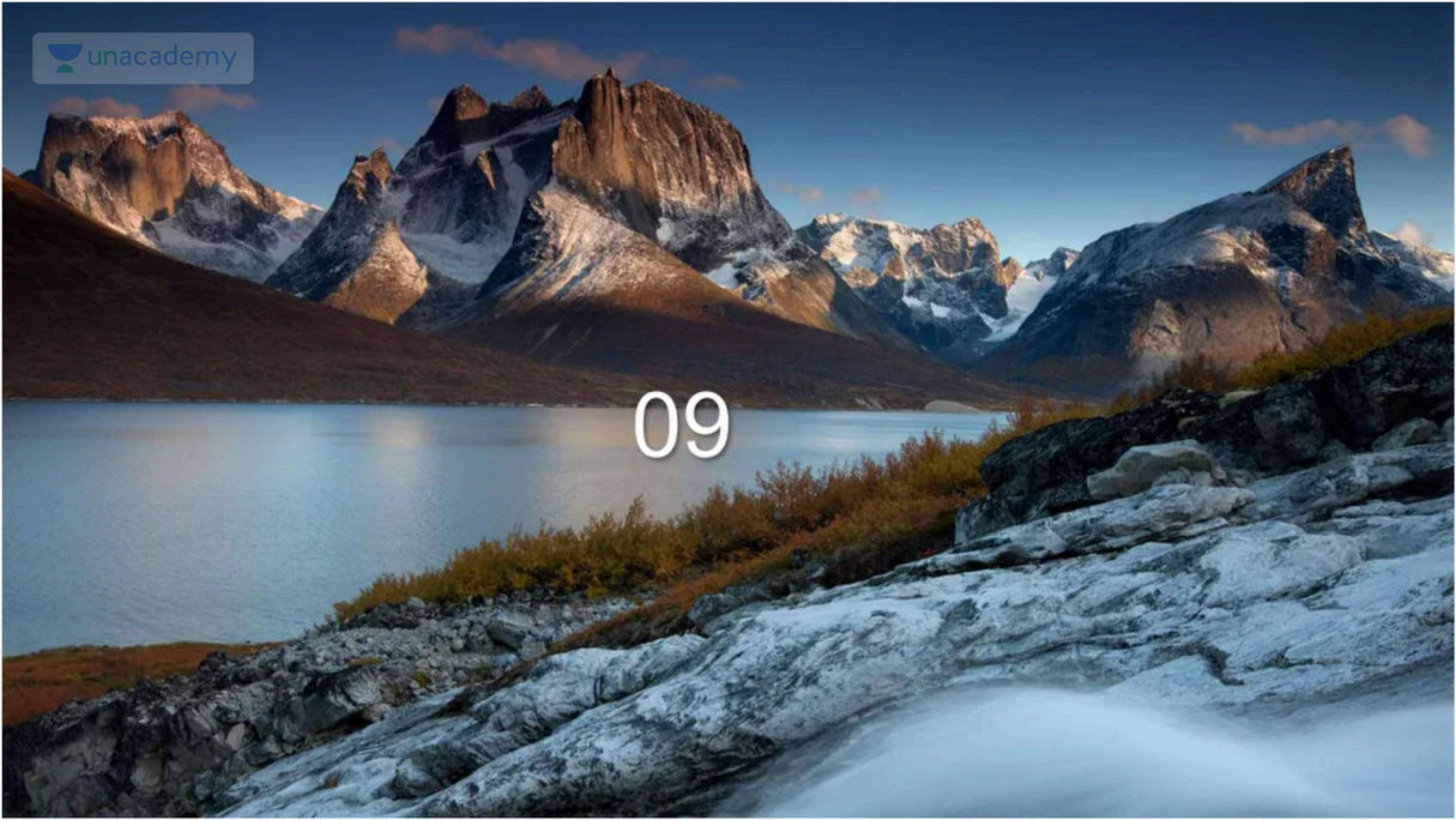
Using the digits : 0,1,2,3,4 and 5 how many three digit numbers can be formed , such that it must have :

(A) Exactly one 5
(B) Exactly two 5
(C) At least one 5

unacademy
08

Using the digits : (1) 1,2,3,4,5,6,7,8 and 9 (2) 0, 1,2,3,4,5,6,7,8 and 9 how many three digit numbers can be formed , such that it must have :

(A) Exactly one 7 (B) Exactly two 7
(C) At least one 7


unacademy
09

Using the digits : (1) 1,2,3,4 and 5 (2) 0, 1,2,3,4 and 5 how many three digit numbers can be formed , such that :

(A) The ten's place is greater than the unit's place digit .
(B) The ten's place is greater than the unit's place digit and less the hundred's place digit.

unacademy
10

Using the digits : (1) 1,2,3,4,5,6,7,8 and 9 (2) 0,1,2,3,4,5,6,7,8 and 9 how many three digit numbers can be formed , such that :

(A) The ten's place is greater than the unit's place digit.
(B) The ten's place is greater than the unit's place digit and less the hundred's place digit.

unacademy
11

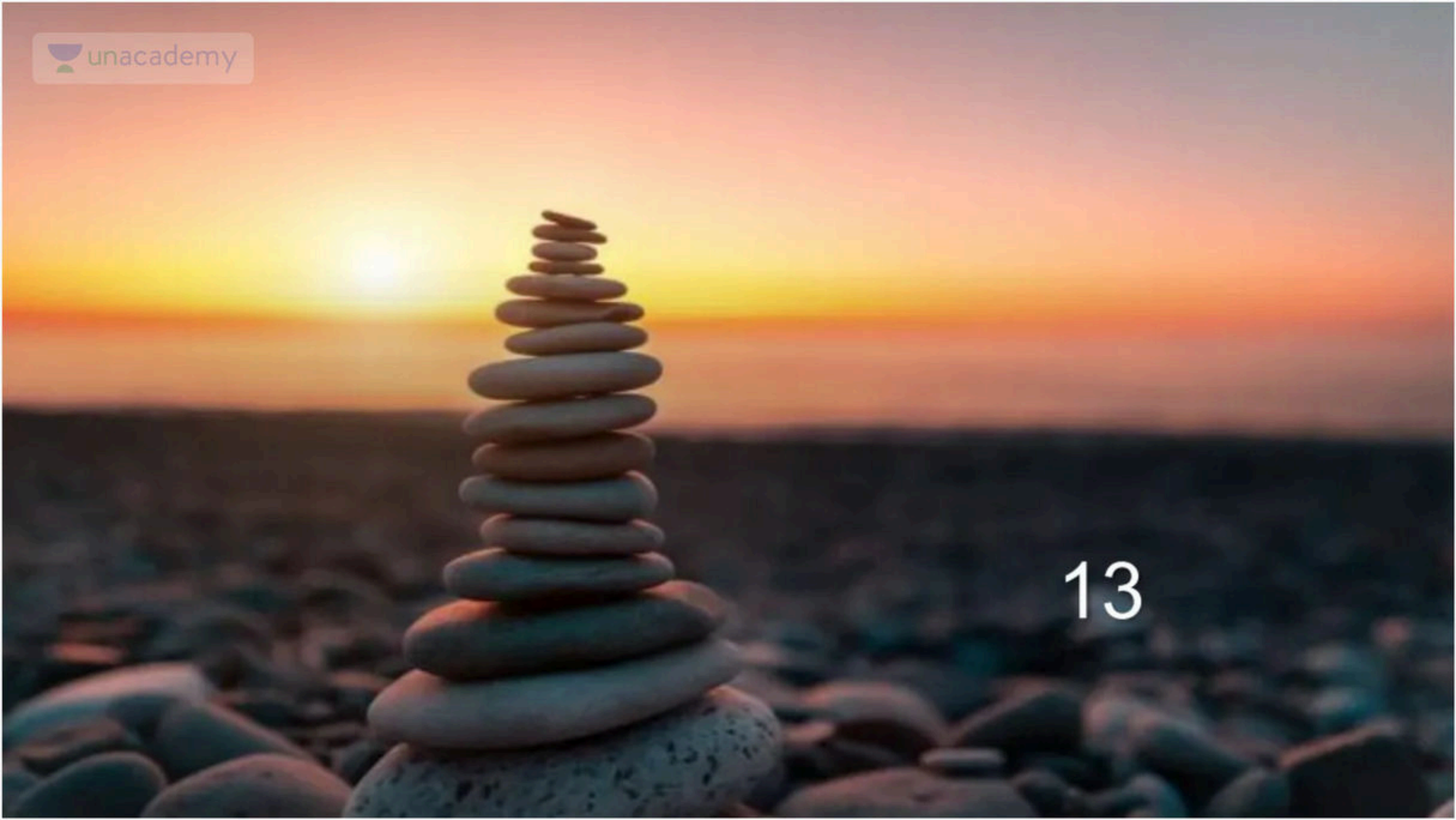
How many different words can be formed from the letters of the word GANESHPURI when:

(A) All the letters are taken.
(B) The letter G always occupies the first place.
(C) The letters P and E respectively occupy the first and last places.
(D) All the vowels are always together.
(E) How many words of 5 letters each can be formed each containing 3 consonants and 2 vowels?
(F) All the vowels are never together.
(G) No 2 vowels are together.

unacademy
1
12

How many committees of 5 members each can be formed from 8 official and 4 non-official members in the following cases :

(A) Each consisting of 3 official and 2 nonofficial members.
(B) Each contains at least two non-official members.
(C) Each consisting of at most two official members.
(D) A particular official member is always included.
(E) A particular non-official member is never included.


unacademy
13

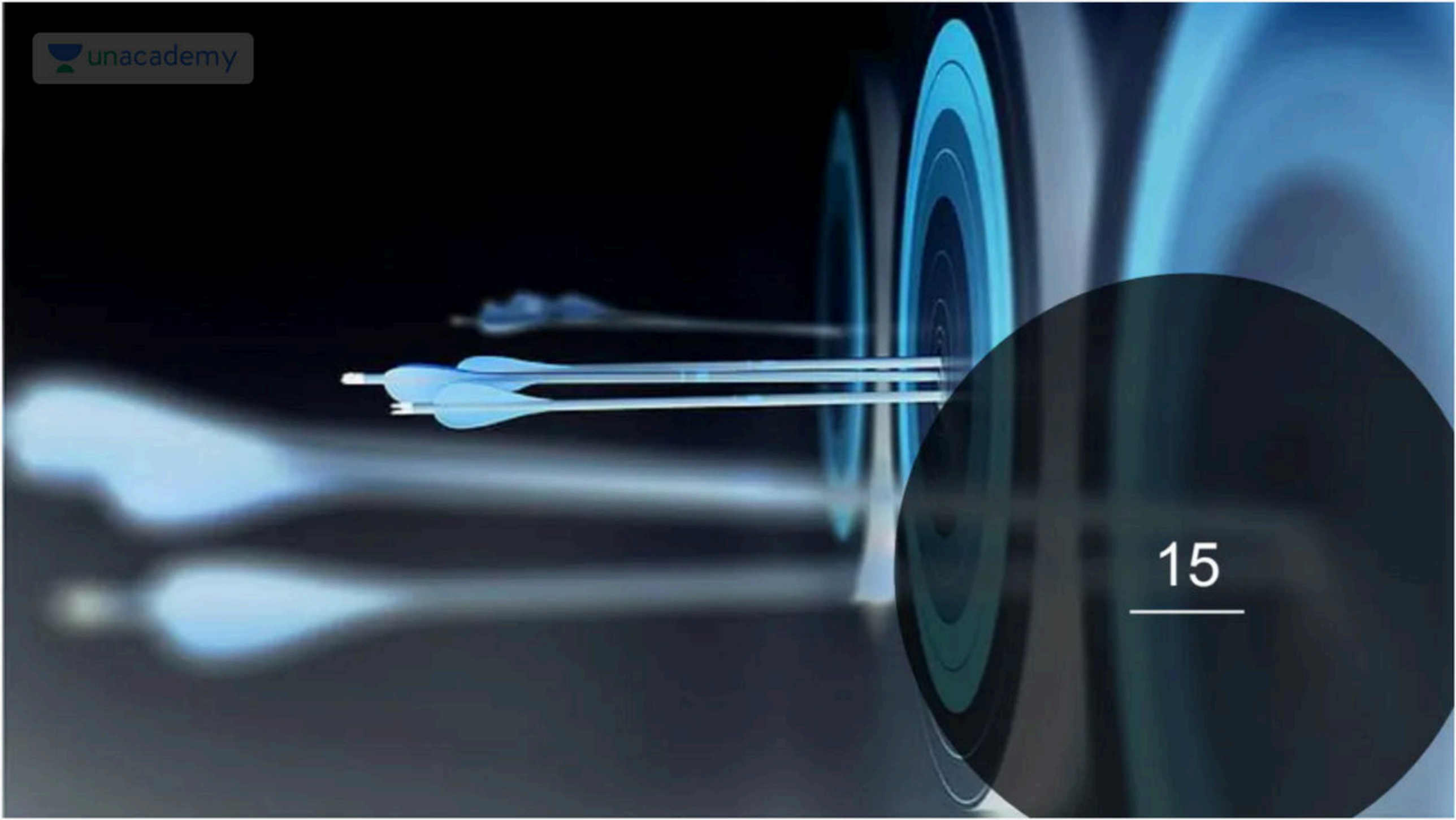
Out of 8 men and 10 women a committee consisting of 6 men and 5 women is to be formed. How many such committees can be formed when one particular man A refuses to be a member of the committee is which his boss B's wife is there?

unacademy
14

There are 4 women *P*, *Q*, *R*, *S* and 5 men *V*, *W*, *X*, *Y*, *Z* in a group. We are required to form pairs each consisting of one woman and one man. P is not to be paired with *Z*, and *Y* must necessarily be paired with someone. In how many ways can 4 such pairs be formed?

(A) 74 (B) 76
(C) 78 (D) 80

**[GATE 2017 : IIT Roorkee (ME Set – 2)]**


unacademy
15

A three-member committee has to be formed a group of 9 people. How many such distinct committees can be formed?

(A) 27 (B) 72
(C) 81 (D) 84

**[GATE 2018 : IIT Guwahati (CE Set – 2)]**

unacademy
16

An e-mail password must contain three characters. The password has to contain one numeral from 0 to 9, one upper and one lower case character from the English alphabet. How many distinct passwords are possible?

(A) 6,760 (B) 13,520
(C) 40,560 (D) 1,05,456

**[GATE 2018 : IIT Guwahati (EE Set – 1)]**

unacademy
17

Arun, Gulab, Neel and Sweta must choose one shirt each from a pile of four shirts coloured red, pink, blue and white respectively. Arun dislikes the colour red and Sweta dislikes the colour white. Gulab and Neel like all the colours. In how many different ways can they choose the shirts so that no one has a shirt with a colour he or she dislikes?

(A) 21
(B) 18
(C) 16
(D) 14

**[GATE 2017 : IIT Roorkee (EE, CS, Set – 1)]**

unacademy
18

A candidate is required to answer 7 out of 15 questions which are divided into three groups A,B,C each containing 4, 5 , 6 questions respectively. He is required to select at least 2 questions from each group. In how many ways can he make up his choice?

unacademy
19

There are 3 Indians and 3 Chinese in a group of 6 people. How many subgroups of this group can we choose so that every subgroup has at least one Indian?

(A) 56
(B) 52
(C) 48
(D) 44

**[GATE 2017 : IIT Roorkee (EC, BT, PI Set – 1)]**

unacademy
20

What is the sum of all 4 digit numbers which can be formed using the digits 1,2,3 and 4 without repetition?

unacademy
21

What is the sum of all 5 digit numbers which can be formed using the digits (exactly once):

(A) 1,2,3,4 and 5.
(B) 1,1,2,3 and 4.
(C) 1,1,2,2 and 2
(D) 0,1,2,3 and 4.
(E) 0,1,1, 2 and 3.

unacademy
22

A five digit number is formed using the digits 1,3,5,7 and 9 without repeating any of them. What is the sum of all such possible five digit numbers?

(A) 6666660
(B) 6666600
(C) 6666666
(D) 6666606

**[GATE 2014 : IIT Kharagpur (EC Set – 4, ME Set - 4)]**

unacademy
23

In how many ways may 6 Hindi medium students and 6 English medium students sit :

(A) In a line
(B) Around a round table such that two Hindi medium students may never sit together?

unacademy
24

Four cards lie on a table. Each card has a number printed on one side and a colour on the other. The faces visible on the cards are 2, 3, red and blue.
Proposition : If a card has an even value one side, then its opposite face is red.
The cards which MUST be turned over to
verify the above proposition are

(A) 2, red
(B) 2, 3, red
(C) 2, blue
(D) 2, red, blue

**[GATE 2017 : IIT Roorkee (IN, CE, Set – 2)]**

unacademy
25

How many diagonals are there in an n side polygon.

unacademy
26

Find the number of :

(A) Straight Lines
(B) Diagonals
(C) Triangles formed in a decagon.

unacademy
27

Out of 18 points in a plane, no three are in the same straight line except five points which are collinear. How many

(A) Straight lines
(B) Triangles can be formed by joining them?

unacademy
28

A 2 × 4 rectangle grid shown below, each cell is a rectangle. How many rectangles can be observed in the grid?

(A) 21
(B) 27
(C) 30
(D) 36

**[GATE 2016 : IISc Bangalore (EE Set - 1, CSE Set - 1)]**

unacademy
29

A set of 4 parallel lines intersect with another set of 5 parallel lines. How many parallelograms are formed?

(A) 20 (B) 48
(C) 60 (D) 72

**[GATE 2018 : IIT Guwahati (IN Set – 1)]**

unacademy
30

Everybody in a room shakes hands with everybody else. The total number of hand shakes is 66. The total number of persons in the room is 12. True or False ?

unacademy
31

In a football championship, there were played 153 matches. Every two teams played one match with each other. The number of teams. Participating in the championship is ……

unacademy
32

930 Deepawali greeting cards are exchanged amongst the students of a class. If every student sends a card to every other student then what is the number of students in the class?

unacademy
33

Five teams have to compete in a league, with every team playing every other team exactly once, before going to the next round. How many matches will have to be held complete the league round of matches?

(A) 20 (B) 10
(C) 8 (D) 5

**[GATE 2015 : IIT Kanpur (ME Set - 3, IN)]**

unacademy
34

If all the letters of the word ‘AGAIN’ be arranged as per English dictionary , what is the 50th word.

unacademy
SUCCESS
35

How many word can be formed by taking 4 letters at a time out of the letters of the word MATHEMATICS ?

unacademy
36

A five digit number is formed using the digits 1,3,5,7 and 9 without repeating any of them. What is the sum of all such possible five digit numbers?

(A) 6666660
(B) 6666600
(C) 6666666
(D) 6666606

**[GATE 2014 : IIT Kharagpur (EC Set – 4, ME Set - 4)]**