



Aakash

Medical | IIT-JEE | Foundations

KNOWLEDGE BYTES

FEBRUARY 2026

CLASS 8





Aakash

Medical | IIT-JEE | Foundations

ALL RIGHTS RESERVED

All rights including copyright and translation rights etc. reserved and vests exclusively with AESL. No part of this publication may be reproduced, distributed, redistributed, copied or transmitted in any form or by any means-graphical, electronic or mechanical methods including photocopying, recording, taping or stored on information retrieval systems of any nature or reproduced on any disc, tape, media, information storage device, without the prior written permission of AESL. Breach of this condition is liable for legal action (civil as well as criminal) under the applicable Laws.

Edition: 2025-26

© Aakash Educational Services Limited [AESL]



PREFACE

What is Knowledge Bytes ?

Knowledge Bytes is a collection of riddles, interesting facts, mnemonics, and puzzles that will make your learning fun and engaging.

We want you to be delighted about studying. Knowledge Bytes helps you to know more about the subject in a fun, motivating and educational way and helps to implement what you learn in a creative way.

Benefits



Saves Time



Develops Learning Skills



Stimulates Interest



Leads to Increased Comprehension

Aakash

Medical | IIT-JEE | Foundations





Comparing Quantities

Amazing Short Tricks

On selling an article for ₹ x, a person earns a% profit. In order to earn b% profit, he must sell the article for

$$\text{₹}x \times \frac{(100 + b)}{(100 + a)}$$

? On selling an article for ₹ 11,000, a man gains 10%. What should be the selling price, if desired profit is 20%?

Sol. : $SP = 11000 \times \frac{(100 + 20)}{(100 + 10)}$

$$SP = 11000 \times \frac{120}{110}$$

SP = ₹ 12,000

Aakash

Interesting table to find amount using compound interest

R%	$P \left(1 + \frac{R}{100}\right)^n$	$P \left(1 + \frac{R}{200}\right)^{2n}$	$P \left(1 + \frac{R}{400}\right)^{4n}$
4%	$P \left(\frac{26}{25}\right)^n$	$P \left(\frac{51}{50}\right)^{2n}$	$P \left(\frac{101}{100}\right)^{4n}$
5%	$P \left(\frac{21}{20}\right)^n$	$P \left(\frac{41}{40}\right)^{2n}$	$P \left(\frac{81}{80}\right)^{4n}$
10%	$P \left(\frac{11}{10}\right)^n$	$P \left(\frac{21}{20}\right)^{2n}$	$P \left(\frac{41}{40}\right)^{4n}$
20%	$P \left(\frac{6}{5}\right)^n$	$P \left(\frac{11}{10}\right)^{2n}$	$P \left(\frac{21}{20}\right)^{4n}$
25%	$P \left(\frac{5}{4}\right)^n$	$P \left(\frac{9}{8}\right)^{2n}$	$P \left(\frac{17}{16}\right)^{4n}$

Short Trick-I

To find units digit of any number raised to any power :

$$2^1 = 2, \quad 2^2 = 4, \quad 2^3 = 8, \quad 2^4 = 16, \quad 2^5 = 32,$$

After every fourth power units digit repeats itself

\therefore Cyclicity of 2 is "four"

Now, let us discuss the cyclicity of other numbers

$$3^1 = 3$$

$$3^2 = 9$$

$$3^3 = 7$$

$$3^4 = 1$$

$$3^5 = 3$$

cyclicity of 3 is 4

$$7^1 = 7$$

$$7^2 = 9$$

$$7^3 = 3$$

$$7^4 = 1$$

$$7^5 = 7$$

cyclicity of 7 is 4

$$8^1 = 8$$

$$8^2 = 4$$

$$8^3 = 2$$

$$8^4 = 6$$

$$8^5 = 8$$

cyclicity of 8 is 4

$$4^1 = 4$$

$$4^2 = 6$$

$$4^3 = 4$$

$$4^4 = 6$$

\therefore after every 2nd power,
units digit repeats itself
 \therefore cyclicity of 4 is equal
to 2

$$9^1 = 9$$

$$9^2 = 1$$

$$9^3 = 9$$

$$9^4 = 1$$

$$9^5 = 9$$

cyclicity of 9 is 2

$$5^1 = 5$$

$$5^2 = 5$$

$$5^3 = 5$$

cyclicity of 5 is 1

$$6^1 = 6$$

$$6^2 = 6$$

$$6^3 = 6$$

cyclicity of 6 is 1



1 Units digit of $(4)^{275642}$

2 Units digit of $(9)^{5642874}$

3 Units digit of 2^{193}

4 Units digit of $(12)^{56} \times (19)^{561} \times (17)^{168}$



Interesting Facts

The ancient Greek Mathematician Pythagoras believed that all numbers were rational, but one of his students Hippasus proved (using geometry) that you could not write the square root of 2 as fraction, and so it was irrational.

So, Hippasus is sometimes credited with the discovery of the existence of irrational numbers.

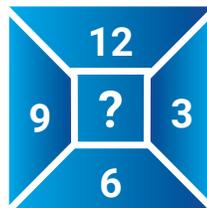
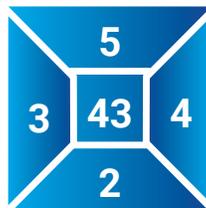
But followers of Pythagoras could not accept the existence of irrational numbers, and it is said that Hippasus was drowned at sea as a punishment from the gods.



Numbers Puzzle

Choose correct number in place of ?

1 >>>



(a) 18

(b) 259

(c) 59

(d) 1642

2 >>>

$$2 + 6 = 8$$

$$3 + 9 = 20$$

$$11 + 1 = 32$$

$$7 + 5 = 44$$

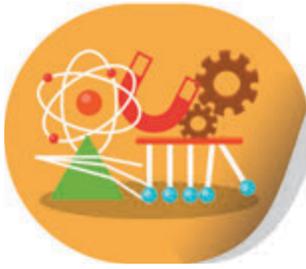
$$9 + 13 = ?$$

(a) 60

(b) 62

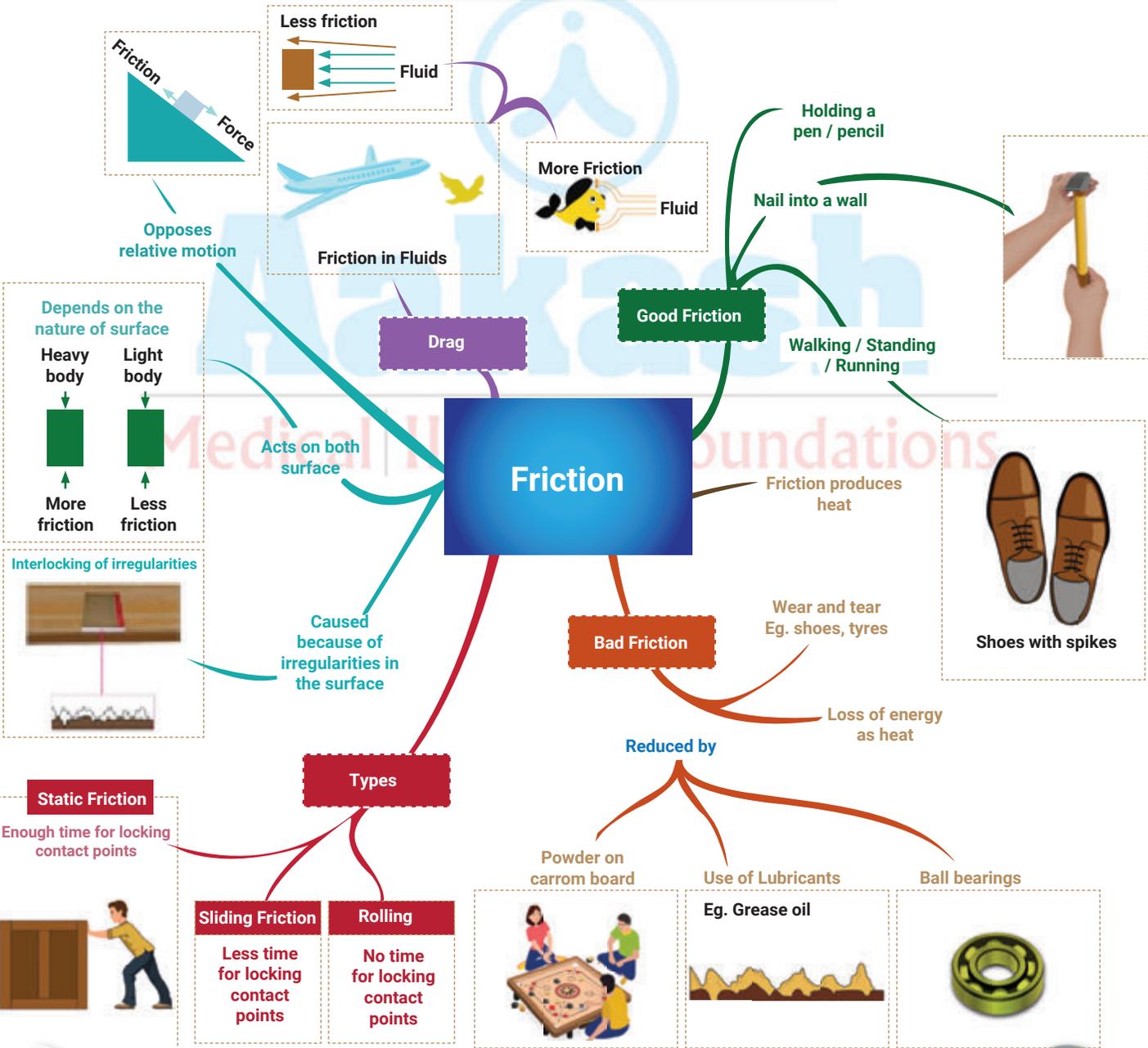
(c) 66

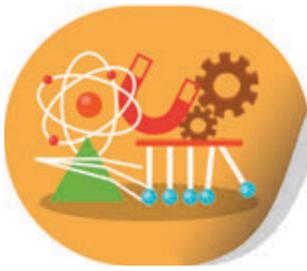
(d) 68



Friction

Mind Map on Friction



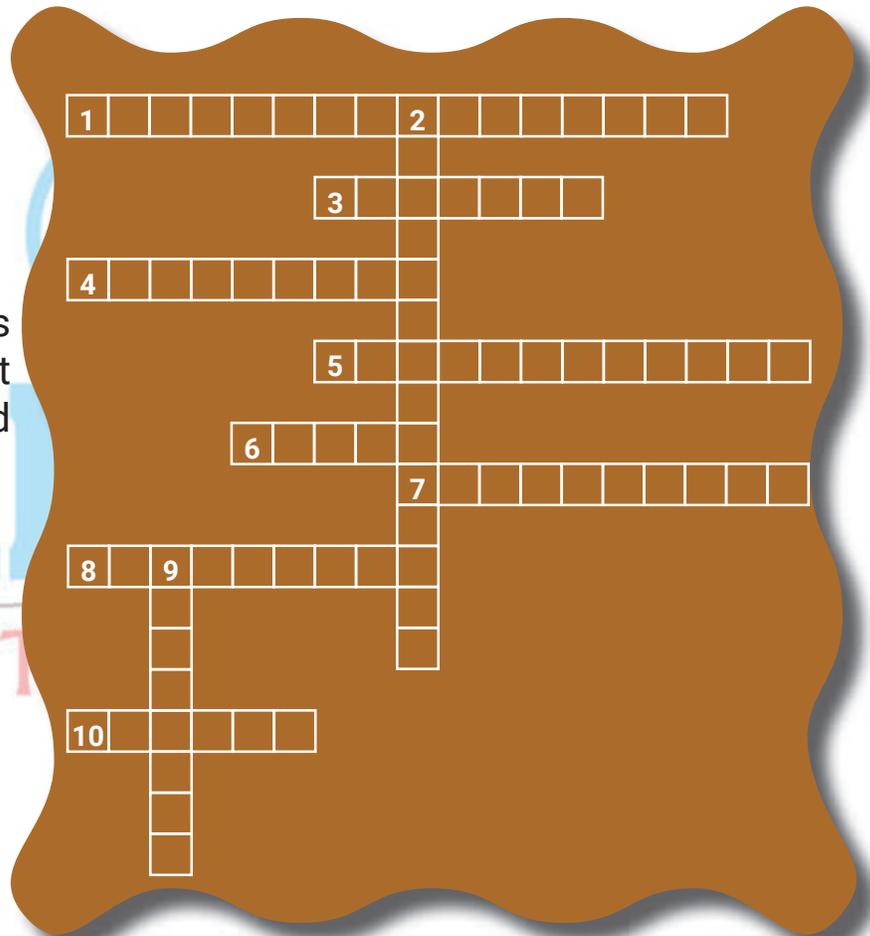


Light

/// Crossword

ACROSS

1. Phenomenon of changing side from left to right and vice versa by mirror while forming images. [16]
3. The reflection that takes place when light is incident on smooth, polished and regular surfaces. [7]
4. The spot at which there are no sensory cells hence no vision is possible. [9]
5. Beautiful patterns formed in this due to multiple reflections. [12]
6. How many colours are present in white light. [5]
7. Splitting of light into its constituent colors. [10]
8. The angle between normal and incident ray. [9]
10. Transparent front part of the eye. [6]



DOWN

2. Eye problem caused due to deficiency of vitamin A. [14]
9. The disease when the eye lens becomes opaque and eyesight becomes foggy. [8]



Group Them Accordingly To Application

Knife, Camel's foot, Saw, Wide bag pad, Iron nail, Spade, Studs on shoes, Skies on snow, Injection needle, High heel, More tyre truck, Railway track on wooden block

S.No.	Pressure is more area is less	Pressure is less area is more
1.		
2.		
3.		
4.		
5.		
6.		
7.		

Answer (Group Them Accordingly To Application)

S.No.	Pressure is more area is less	Pressure is less area is more
1.	Knife	Camel's foot
2.	Saw	Wide bag pad
3.	Iron nail	Skies on snow
4.	Spade	More tyre truck
5.	Studs on shoes	Railway track wooden block
6.	Injection needle	
7.	High heel	



/// Answer (Crossword)

2

1 L A T E R A L I N V E R S I O N

I

3 R E G U L A R

H

4 B L I N D S P O T

B

5 K A L E I D O S C O P E

I

6 S E V E N

7 D I S P E R S I O N

N

9

8 I N C I D E N C E S

A

T

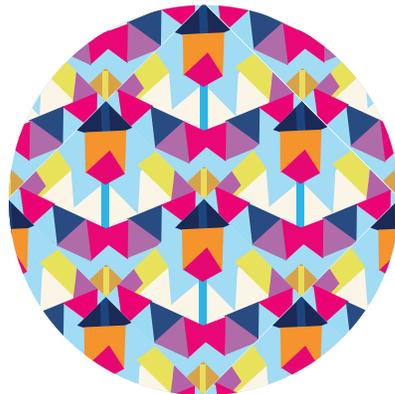
A

10 C O R N E A

A

C

T





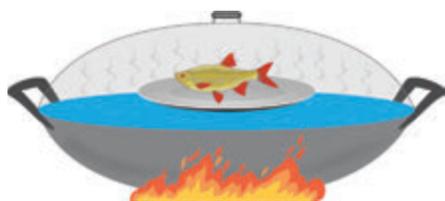
Nature of Matter



Interesting Facts

Drinks can be cooled by adding several cubes of ice in it. When ice melts, a large amount of heat is absorbed and this lowers the temperature of the drink.

1



2

Water has a large latent heat of vaporization. This property enables steam to be used for cooking by the method of steaming. When steam condenses on the food, the latent heat is released directly onto the food which enables the food to be cooked at faster rate.



Always be very careful while opening the lid of a pot when the water in it is boiling. Water has a large latent heat of vaporization. When steam condenses on the skin of your arm, a very large amount of latent heat is released which can cause a serious burn.

3



4

The freshness of fish and meat can be maintained by placing them in contact with ice. With its larger latent heat, ice is able to absorb a large quantity of heat from the fish as it melts. Thus, food can be kept at a low temperature for an extended period of time.

Our bodies feel cool after sweating because when sweat evaporates, it takes away heat from the body. As a result, the body is cooled.

5

(Jumbled Words)

The underlined word in the following sentences have been jumbled up. Write them in correct form.

- 1 Solids have negligible mssirepcotyilb.
- 2 Each element is made up of identical particles called smota.
- 3 Pure substance can be either an element or a mocpuond.
- 4 The solute dissolves in the solvent to form a lusotion.
- 5 The amount of matter present in an object is known as its sams.



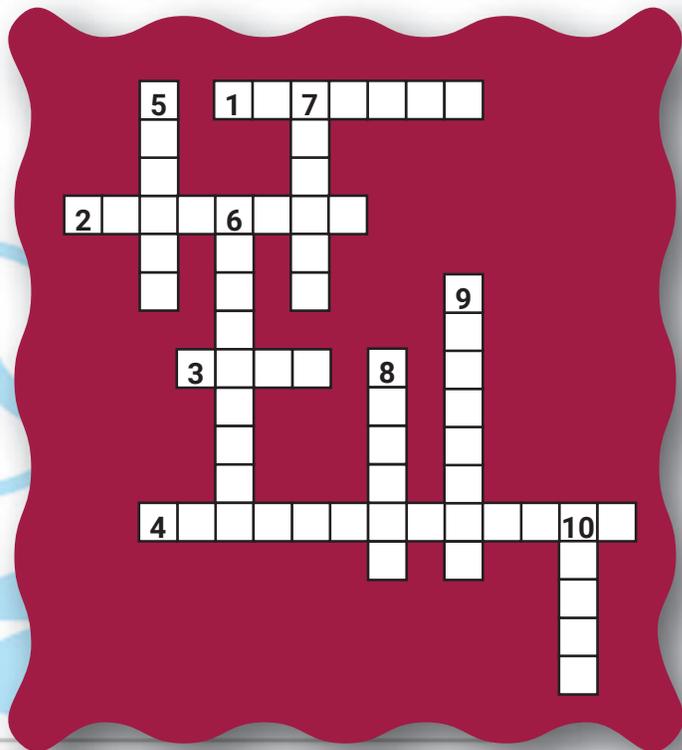
Crossword

ACROSS

- 1 _____ is an example of sublimable solid. [7]
- 2 Ability of a substance to flow is known as _____. [8]
- 3 Boiling is a _____ phenomenon. [4]
- 4 Form of energy which enables the particles to move apart. [7, 6]

DOWN

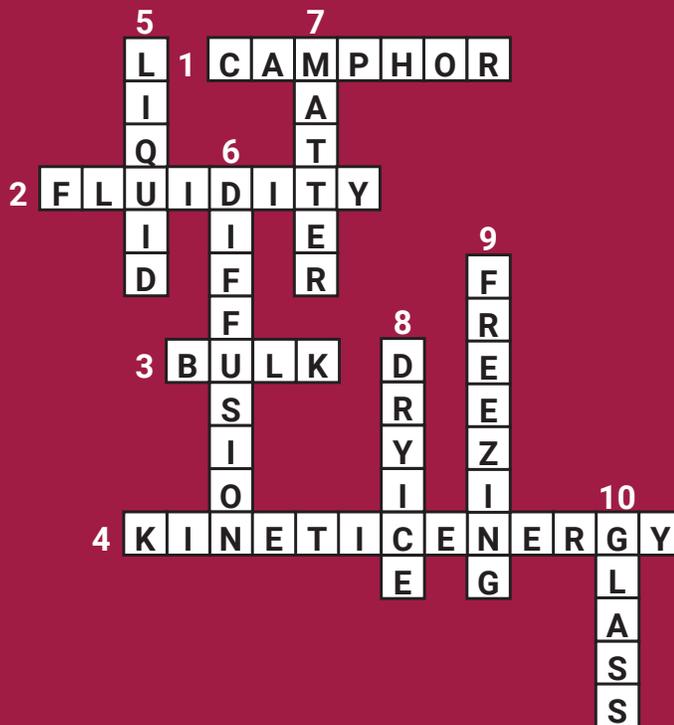
- 5 _____ is a state of matter which has a definite volume but indefinite shape. [6]
- 6 Intermixing of particles of two different types of matter on their own. [9]
- 7 _____ is anything that has mass and occupies space. [6]
- 8 Solid CO_2 is commonly known as _____. [3, 3]
- 9 The process of conversion of liquid into solid is known as _____. [8]
- 10 _____ is an example of super cooled liquid. [5]



Answer (Jumbled Words)

- 1 Compressibility
- 2 Atoms
- 3 Compound
- 4 Solution
- 5 Mass

Answer (Crossword)



Interesting Facts

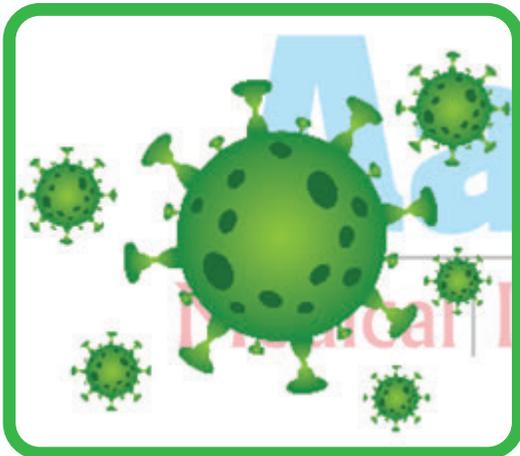
HOW QUICKLY CAN MICROBES REPRODUCE?

They are fast, but some of them are really slow. *E. coli* reproduces every 20 minutes whereas *Mycobacterium tuberculosis* reproduces very slow. That is why TB tests take a lot longer than your usual *E. coli* test.



VIRUSES ARE BEAUTIFUL PHYSICAL OBJECTS

Despite their destructiveness as disease causing agents, viruses are very beautiful as physical objects when seen under the microscope. "Viruses have higher symmetry than any other thing in nature," Gelbart said. Most viruses have symmetry, like an old-fashioned soccer ball with its 12 black pentagons and 20 white hexagons.



TYPHOID MARY

A classic case in medicine, is that of Mary Mallon nicknamed Typhoid Mary. She was a cook by profession and was a typhoid carrier who continued to spread typhoid for several years through the food she prepared.

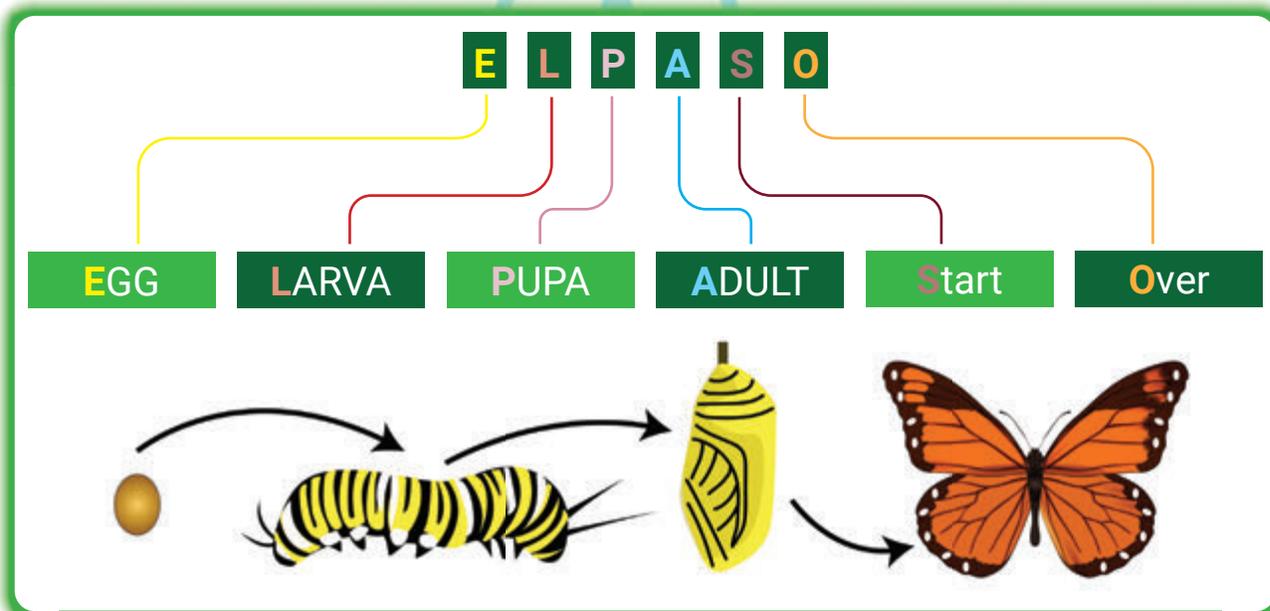




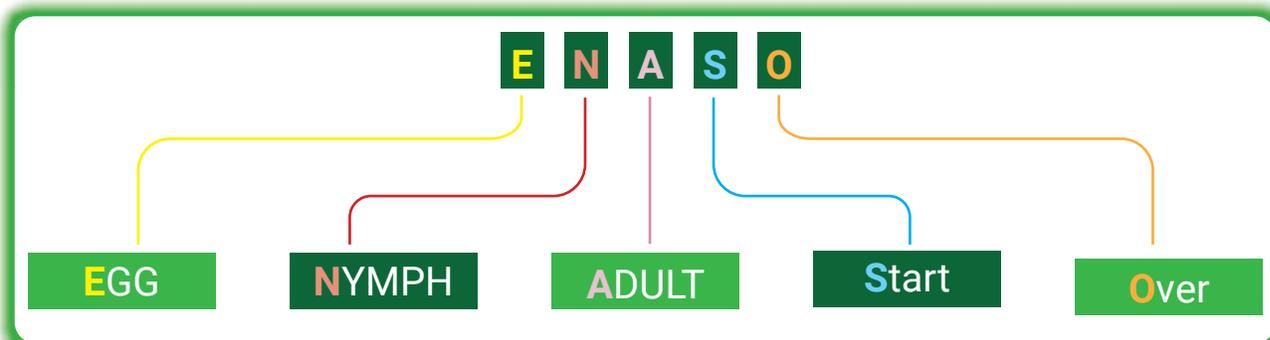
Mnemonics

Metamorphosis is of Two Types

1. Complete – In this, stages are egg, larva, pupa, adult
Mnemonic for complete metamorphosis - E.L.P.A.S.O



2. Incomplete- In this, stages are egg, nymph, adult
Mnemonic for incomplete metamorphosis- E.N.A.S.O

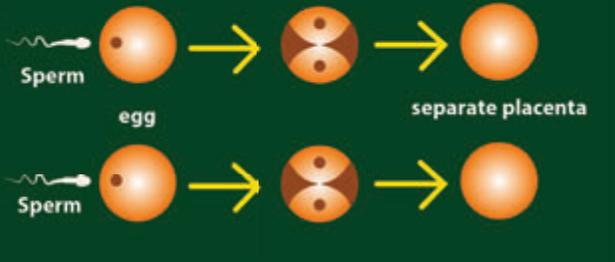


Fraternal Twins



Fraternal Twins

- Develop from 2 sets of egg and sperm
- Same sex or one of each

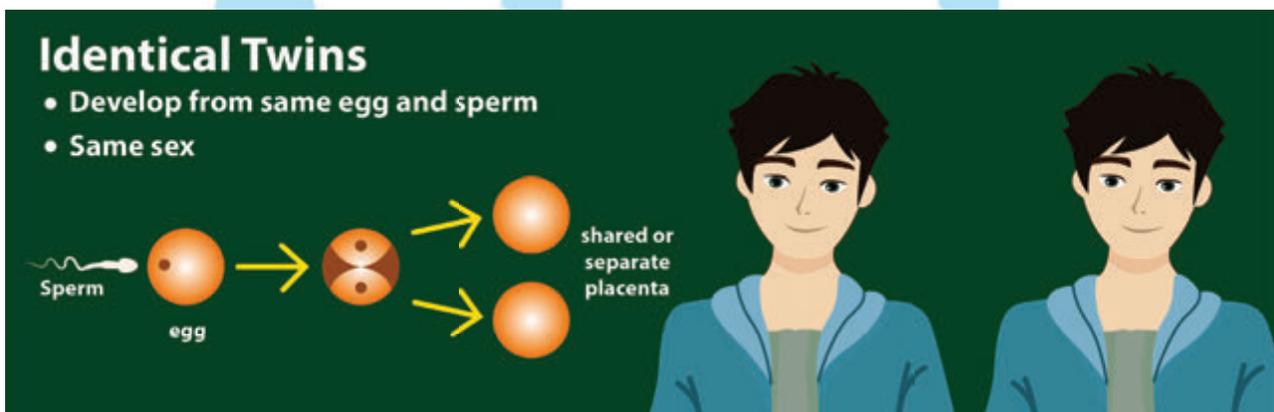


Sperm egg separate placentas

Identical Twins

Identical Twins

- Develop from same egg and sperm
- Same sex

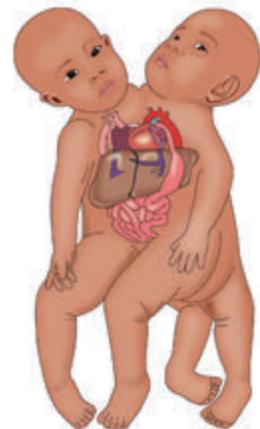


Sperm egg shared or separate placentas



What are conjoined twins ?

- Conjoined or Siamese twins are named for the first well-known pair from Siam (known as Thailand).
- They are formed when identical twinning goes awry.
- The cause of the syndrome is unknown, but it's suspected to be caused by environmental factors.





Judicial System in India

The **Judicial System in India** is the system of courts that interprets laws, protects fundamental rights, and delivers justice to citizens. It is independent from the Legislature and Executive.

Features of Indian Judicial System

Independent Judiciary

Free from government interference.

Single Integrated System

One system for the entire country.

Hierarchy of Courts

Supreme Court → High Courts → Subordinate Courts

Rule of Law

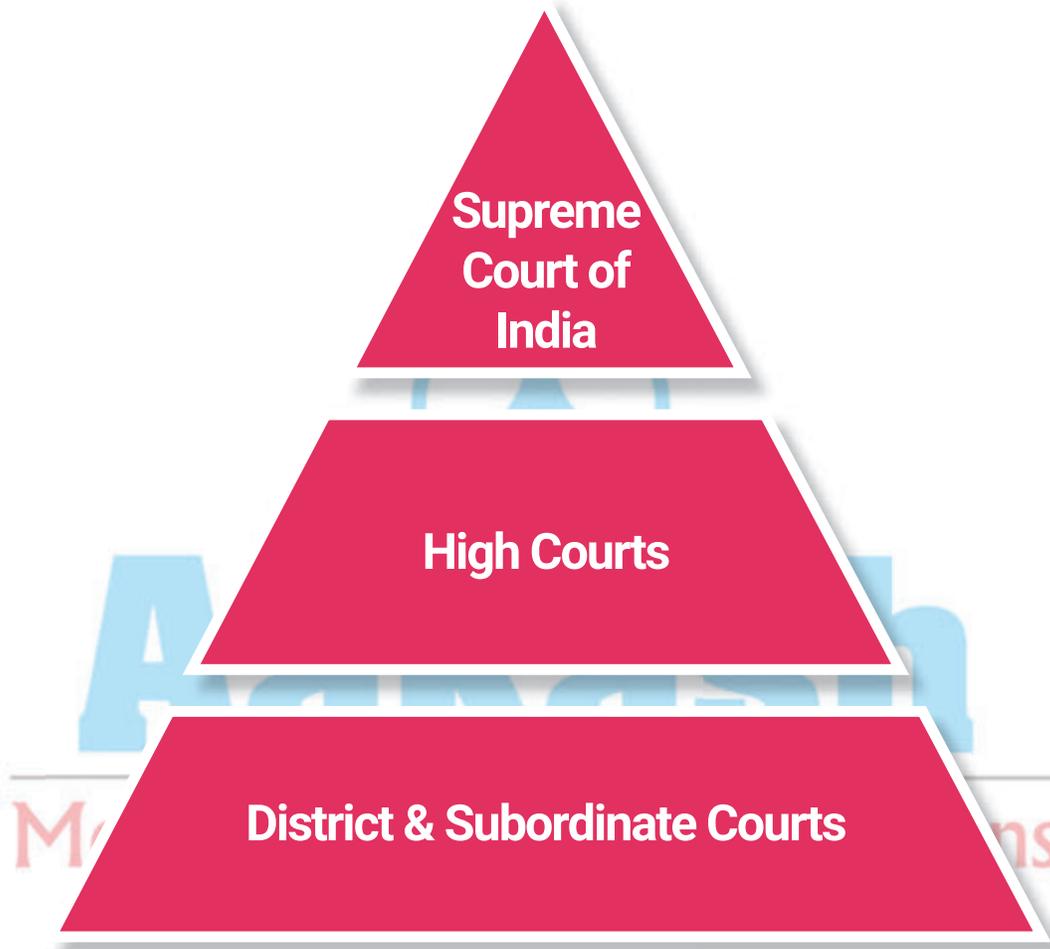
Everyone is equal before law.

Judicial Review

Courts can check laws made by Parliament and State Legislatures.



Structure of Judicial System



Supreme Court of India

- ▶ Highest court of the country
- ▶ Located in New Delhi
- ▶ Guardian of the Constitution
- ▶ Headed by the Chief Justice of India
- ▶ Final authority of justice



Functions

- ▶ Interprets the Constitution
- ▶ Protects the Fundamental Rights
- ▶ Resolves disputes between the states and the centre
- ▶ Hears appeals from the High Courts

High Courts

- ▶ One in each state or group of states
- ▶ Headed by the Chief Justice

Medical | IIT-JEE | Foundations

Functions

- ▶ Hears appeals from the lower courts
- ▶ Protects the Fundamental Rights
- ▶ Supervises the subordinate courts



Subordinate Courts

Located at district and lower levels:

Types

1. **District Courts** – Headed by the District Judge
2. **Civil Courts** – For civil cases
3. **Criminal Courts** – For criminal cases

Importance of Judiciary

- Protects Constitution
- Ensures justice to citizens
- Safeguards democracy





Editing

Directions: There is one error in each line. Identify the incorrect word and supply its correction.

Incorrect **Correct**



Imagine you are vacationing on a foreign country where everything including the language, culture, climate, or food is new to you.

A

B



You visit the vendor, figure out what they are cooking or selling. Check on a ingredients used, cooking style, probably taste a bit and figure out if you actual like the food.

A

B

C



In the evening while he came home, she stood near the staircase and heard his loud voice on the hall.

A

B





Vocabulary



Antonyms

From the given options, choose a word that is **FARTHEST** in meaning to the highlighted word in the given sentences.

- 1 Steps are to be taken to **abate** population.
(a) Decrease (b) Increase
(c) Succeed (d) Deluge
- 2 She has been asked to **abridge** the novel for the radio.
(a) Truncate (b) Sketch
(c) Expand (d) Advocate
- 3 Being a **conscientious** worker, he never shirks his duty.
(a) Honest (b) Casual
(c) Mooring (d) Careless
- 4 He is popular with his fans on account of his **complaisant** nature.
(a) Unwilling (b) Pleasing
(c) Disobliging (d) Unhelpful



- 5 Four other judges **concurred** with his verdict.
- (a) Acceded (b) Disapproved
(c) Coincided (d) Supported
- 6 There wasn't enough coal during the war, so we had to use it **sparingly**.
- (a) Frugally (b) Copiously
(c) Fervour (d) Fairly
- 7 Celebrities believe in wearing **clannish** dresses.
- (a) Welcoming (b) Exclusive
(c) Common (d) Proprietary
- 8 Ahmed **gingerly** moved his injured foot.
- (a) Recklessly (b) Carefully
(c) Quietly (d) Abruptly
- 9 The passengers escaped **unscathed**.
- (a) Infantile (b) Intact
(c) Injured (d) Comity
- 10 The very **brevity** of her explanation was astounding.
- (a) Extensiveness (b) Concise
(c) Curtness (d) Clemency





Answer (Antonyms)

- 1 Steps are to be taken to **abate** population.
(a) Decrease (b) **Increase** ✓
(c) Succeed (d) Deluge
- 2 She has been asked to **abridge** the novel for the radio.
(a) Truncate (b) Sketch
(c) **Expand** ✓ (d) Advocate
- 3 Being a **conscientious** worker, he never shirks his duty.
(a) Honest (b) Casual
(c) Mooring (d) **Careless** ✓
- 4 He is popular with his fans on account of his **complaisant** nature.
(a) **Unwilling** ✓ (b) Pleasing
(c) Disobliging (d) Unhelpful
- 5 Four other judges **concurred** with his verdict.
(a) Acceded (b) **Disapproved** ✓
(c) Coincided (d) Supported



6 There wasn't enough coal during the war, so we had to use it **sparingly**.

- (a) Frugally (b) **Copiously** ✓
(c) Fervour (d) Fairly

7 Celebrities believe in wearing **clannish** dresses.

- (a) Welcoming (b) Exclusive
(c) **Common** ✓ (d) Proprietary

8 Ahmed **gingerly** moved his injured foot.

- (a) **Recklessly** ✓ (b) Carefully
(c) Quietly (d) Abruptly

9 The passengers escaped **unscathed**.

- (a) Infantile (b) Intact
(c) **Injured** ✓ (d) Comity

10 The very **brevity** of her explanation was astounding.

- (a) **Extensiveness** ✓ (b) Concise
(c) Curtness (d) Clemency





Miscellaneous Reasoning

MAT

Move The Tiger

1	2	3	4	5
		 1	 3	
6	7	8	9	10
	 5	 2		
11	12	13	14	15
		 4		
16	17	18	19	20
21	22	23	24	25

Each tiger can jump over one or several  but not diagonally. But it can not jump over an empty cell. If a tiger jump from one box to another box then it is called one move. In how many minimum number of moves  (T1) will reach in box 19 ?

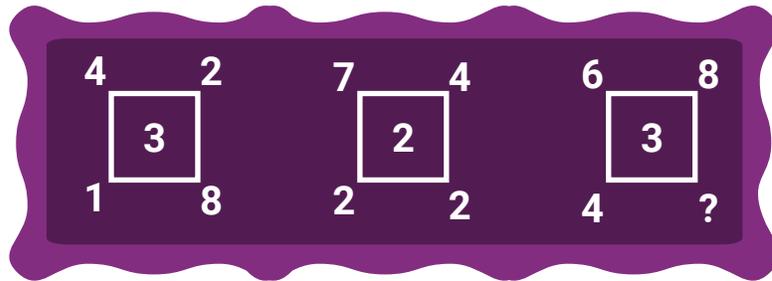


Missing Number

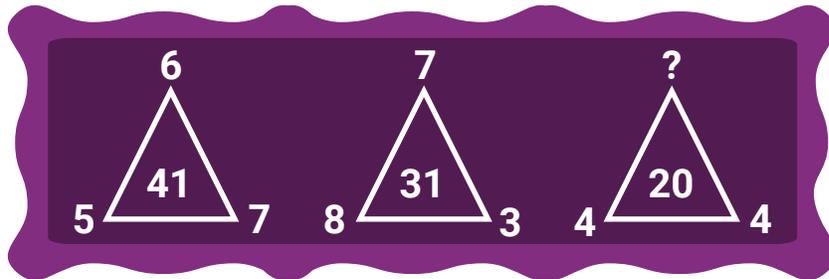
Question-1

5	7	6
4	4	4
8	2	?

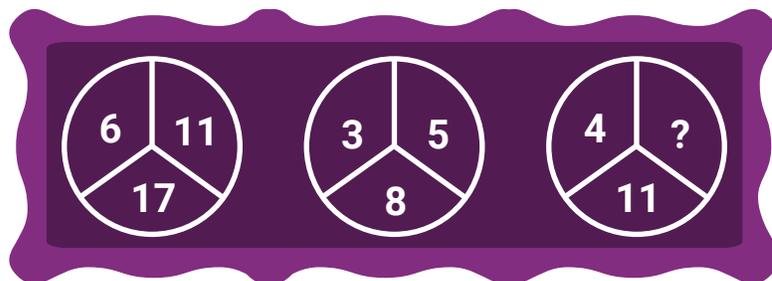
Question-2



Question-3



Question-4



Quiz

If you multiply this number by any other number the answer will always be the same as the given number. What number is this ?

Crack the Code



CODE

A numeric lock has a 3 digits key

HINTS

3 8 2

One number is correct and well placed

4 7 6

One number is correct but wrong placed

8 0 6

One number is correct but wrong placed

7 3 8

Nothing is correct

7 8 0

One number is correct but wrong placed

(a)

0 6 2

(b)

6 0 2

(c)

0 4 2

(d)

2 0 4

Answer (Move the Tiger)

Steps	Movement between Boxes	No. of move
I ⇒ T3 :	4 → 2 → 12	2
II ⇒ T5 :	7 → 17	1
III ⇒ T1 :	3 → 18 → 16	2
IV ⇒ T2 :	8 → 18	1
V ⇒ T1 :	16 → 19	1
		7

Puzzle (Answer)

Solution-1

In this question take average of the numbers of first and second column to get the number in third column.

$$(5 + 7) \div 2 = 6$$

$$(4 + 4) \div 2 = 4$$

$$(8 + 2) \div 2 = 5$$

Hence, answer is **5**

Solution-2

Here in each rectangular figure add the top 2 digits in each figure and multiply it with the central numer given in the figure, then result is written in the bottom.

$$(4 + 2) \times 3 = 18$$

$$(7 + 4) \times 2 = 22$$

$$(6 + 8) \times 3 = 42$$

Hence, answer is **2**

Solution-3

Here in each triangle, the number in the centre of each triangle equal to the the product of bottom two digits plus the top digit.

hence, answer is $4 \times 4 + 4 = 20$

Hence, answer is **4**

Solution-4

Two Tricks :

Tricks I :

Sum of upper two numbers is equal to lower number

$$6 + 11 = 17, 3 + 5 = 8, 4 + 7 = 11$$

Tricks II :

$$(6 \times 2) - 1 = 11 \text{ and } (6 \times 3) - 1 = 17$$

$$(3 \times 2) - 1 = 5 \text{ and } (3 \times 3) - 1 = 8$$

$$(4 \times 2) - 1 = 7 \text{ and } (4 \times 3) - 1 = 11$$

Hence, answer is **7**

Answer (Crack the Code)

(c)

0

4

2

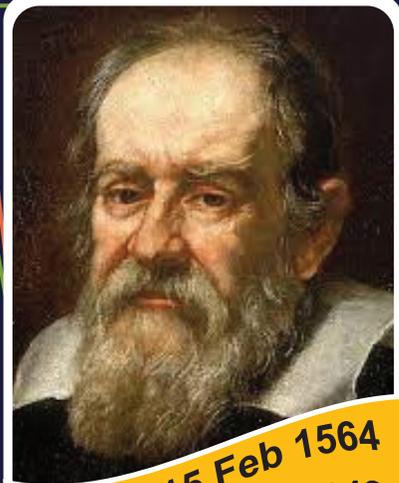
Explanation: From all the hints given, only 042 satisfies and it unlocks the lock.



FATHER OF OBSERVATIONAL ASTRONOMY

Happy Birthday

Galileo Galilei



Born - 15 Feb 1564
Died - 08 Jan 1642

Galileo Galilei is a famous Italian Astronomer, Mathematics Professor, and Physicist who first used the telescope to study space. His contributions in Science and Mathematics still resonate today, and became the basis for different ideas that sprung up during the scientific revolution during and after his time.



NEET 2025 Wasn't Easy. Our Results Say Otherwise.

5 AAKASHIANS IN TOP 10 AIR NEET(UG) 2025



OUR NATIONAL TOPPERS IN NEET (UG) 2025



Our Problem *Solvers* shine bright in **JEE (Advanced) 2025**

Our Top 100 AIR



Aakashians Create History in International Olympiads

(Classroom Program Students)



Dhruv Advani

IBO 2023



Gold Medalists

34th International Biology Olympiad



Rohit Panda



Chirag Falor



International Olympiad on Astronomy & Astrophysics



Dhiren Bhardwaj



32nd International Biology Olympiad



Anshul



32nd International Biology Olympiad



Amritansh Nigam



33rd International Biology Olympiad



Prachi Jindal



33rd International Biology Olympiad



Tanishka Kabra



54th International Chemistry Olympiad

1484 Students Scored Above MAS

420

Classroom Students
Qualified in
NSEs* 2024-25

(Group A & B)

49
NSEA*

(Group A & B)

229
NSEB*

(Group A & B)

70
NSEC*

(Group A & B)

38
NSEP*

34
NSEJS*

Aakashians Qualified for INO-2025



Krishna Agrawal
NSEA | NSEP | NSEC



Mohit Shekher Shukla
NSEA | NSEP | NSEC



Utkarsh Awadhya
NSEB | NSEP | NSEC



Rupayan Pal
NSEC | NSEP | NSEP



Devansh Garg
NSEJS



Aaron Thakkar
NSEJS

and many more...

*NSEA-National Standard Examination in Astronomy | NSEB-National Standard Examination in Biology | NSEC-National Standard Examination in Chemistry
NSEP-National Standard Examination in Physics | NSEJS-National Standard Examination in Junior Science | INO-Indian National Olympiad

Aakashians Qualified for RMO 2024

899

Classroom Students

Qualified
in IOQM
2024



Joish Achyuta
Class - VIII



Dhanush Damu
Class - IX



Arnav Singh
Class - X



Pranit Goel
Class - XI



Aayush Agarwal
Class - XII

and many more...

Aakashians Qualified for INMO 2025

161

Classroom Students

Qualified
in RMO 2024-25



Kotha D Reddy
Reg. No. 00006657265



Abhipraya Verma
Reg. No. 00010407513



Aditya Singh
Reg. No. 00012631688



Rujul Garg
Reg. No. 00005153903



Mohit Shekher Shukla
Reg. No. 00006093814

and many more...

Aakashians Qualified for OCSC/IMOTC-2025

25

Classroom Students

Qualified
in INOs 2025



Pranit Goel
Qualified INMO



Harshit Singh
Qualified INJSO



Subhrojit Paul
Qualified INBO



Mohit Shekher Shukla
Qualified INChO



Rujul Garg
Qualified INPhO



Aditya Singh
Qualified INAO Jr

and many more...

Aakashians Qualified for Merit Certificate

1019

Classroom Students

Qualified
in IMO (Level-I)
2023-24



Intl.
Rank
1

Prisha Miglani
Class - IX



Intl.
Rank
2

Sushant Agarwal
Class - X



Intl.
Rank
4

Ekaashar Gupta
Class - IX



Intl.
Rank
7

Harshit Singh
Class - VIII

438

Classroom Students

Qualified
in IMO (Level-II)
2024

and many more...

Aakashians Qualified for Merit Certificate

4902

Classroom Students

Qualified
in NSO (Level-I)
2024-25



Intl.
Rank
2

Meghav Ladani
Class - X



Intl.
Rank
2

Anubhab Manna
Class - VIII



Intl.
Rank
3

Arnav Gupta
Class - IX



Intl.
Rank
7

Parshti Bajpai
Class - IX



Intl.
Rank
10

Shreya
Class - VIII

and many more...