



Aakash

Medical | IIT-JEE | Foundations

KNOWLEDGE BYTES

JANUARY 2026

CLASS 8





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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

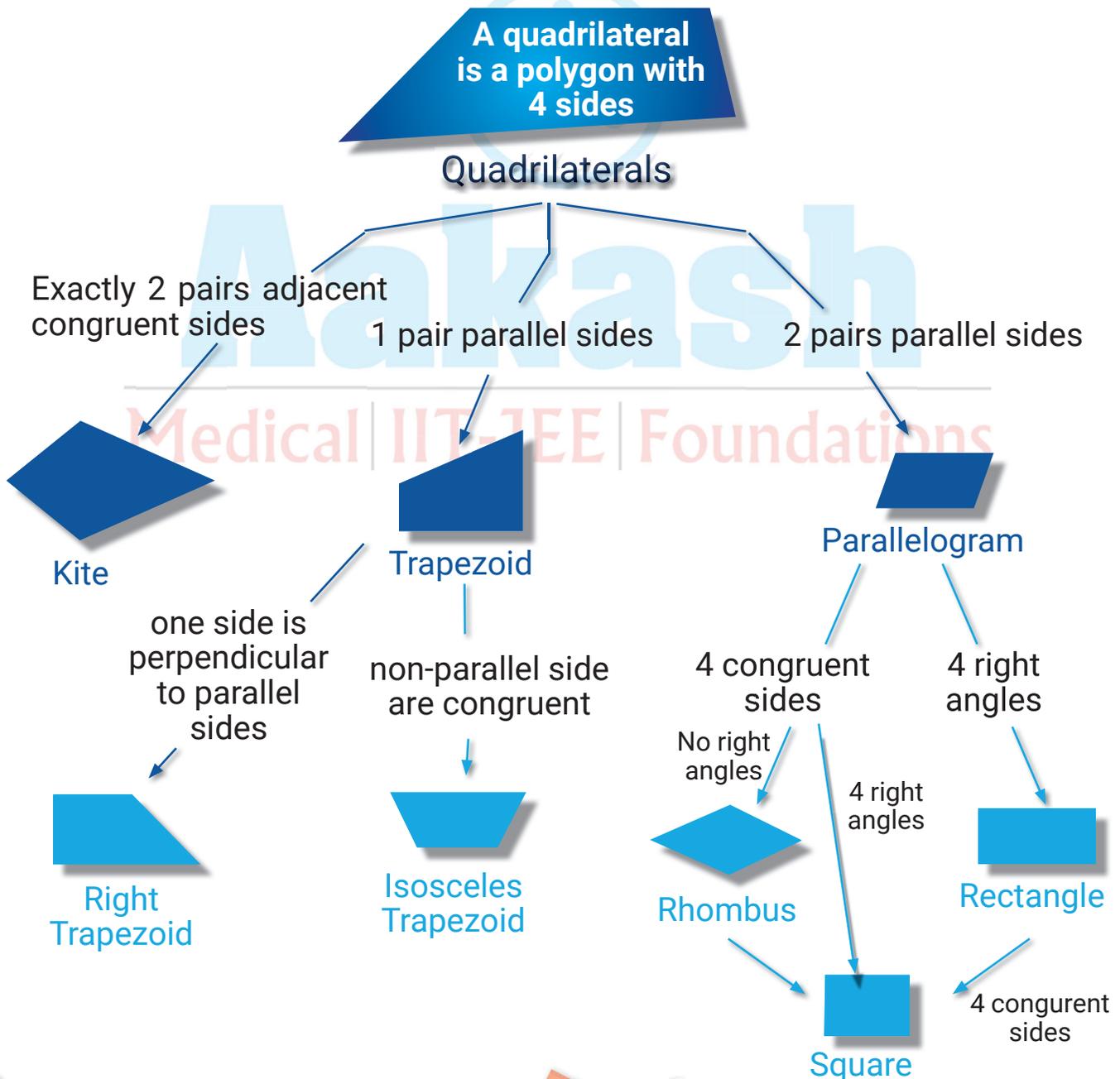
EXPLORE

- | | |
|--------------------------------------|-------|
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Understanding Quadrilaterals

Quadrilateral Family Tree



Quadrilaterals and Their Properties

Property		Rectangle	Square	Parallelogram	Rhombus	Trapezium
Sides	All sides are equal	✗	✓	✗	✓	✗
	Opposite sides are equal	✓	✓	✓	✓	✗
	Opposite sides are parallel	✓	✓	✓	✓	only 1 pair of opposite sides are parallel
Angles	All interior angles are equal	✓	✓	✗	✗	✗
	Opposite angles are equal	✓	✓	✓	✓	✗
	Sum of any two adjacent angles is 180°	✓	✓	✓	✓	sum of only two pairs of adjacent angles is 180 degrees
Diagonals	Bisect each other	✓	✓	✓	✓	✗
	Bisect perpendicularly	✗	✓	✗	✓	✗
Formulas	Area	$l \times b$	a^2	$l \times h$	$\frac{1}{2} \times d_1 \times d_2$	$\frac{1}{2}$ (sum of parallel sides) height
	Perimeter	$2 \times (l + b)$	$4a$	$2 \times (l + b)$	$4a$	sum of all the sides

Quiz Time

Quiz - 1

Which one of the following is always a regular quadrilateral ?

- (a) Square (b) Trapezium (c) Kite (d) Rectangle

Quiz - 2

The perimeter of a parallelogram whose parallel sides have lengths equal to 12 cm and 7 cm is

- (a) 21 cm (b) 42 cm (c) 19 cm (d) 38 cm

Quiz - 3

Which of the following quadrilaterals have only two pairs of adjacent sides equal and its diagonals intersect at 90 degrees ?

- (a) Square (b) Kite (c) Rhombus (d) Rectangle

Quiz - 4

Which one of the following is not a quadrilateral ?

- (a) Square (b) Rectangle (c) Triangle (d) Parallelogram

Answer (Quiz Time)

Solution - 1

Ans. (a) : Square

Explanation : A square has all its sides equal and angles equal to 90 degrees.

Solution - 2

Ans. (d) : 38 cm

Explanation : Perimeter of parallelogram = 2 (sum of parallel sides)

$$P = 2 (12 + 7)$$

$$P = 2 (19)$$

$$P = 38 \text{ cm}$$

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Solution - 3

Ans. (b) : Kite

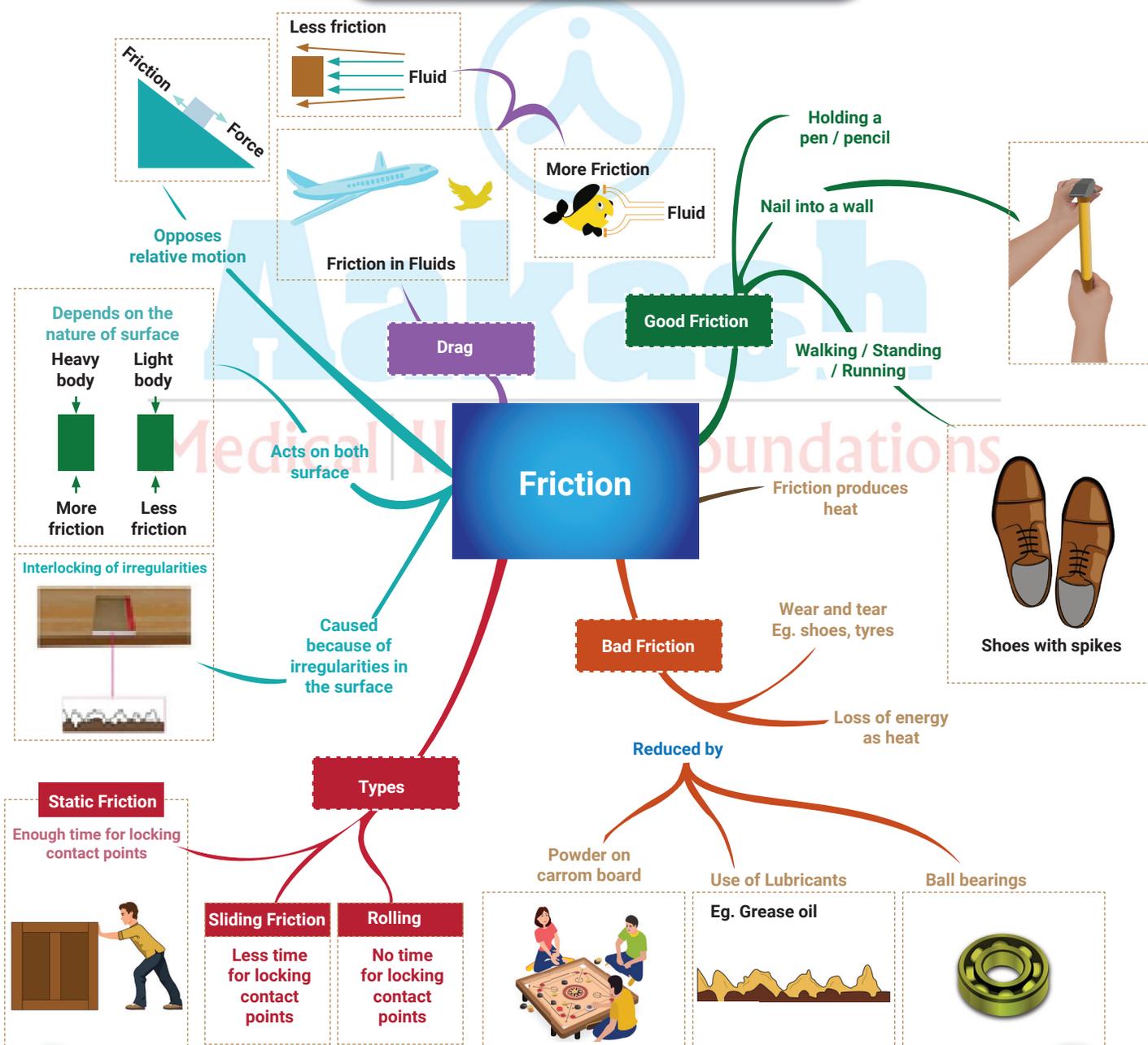
Solution - 4

Ans. (c) : Triangle

Explanation : A quadrilateral is a four-sided polygon but triangle is a three-sided polygon.

Friction

Mind Map on Friction



Fun Facts

1

Liquid smooths out a surface, creating less friction. For example, it's harder for a car to stop on a wet road than a dry one because the water creates a barrier between the car and the road. The tyres don't have as much contact with the road.

Oil in a car engine lubricates the parts so they experience less friction. Friction causes heat, which can damage a car engine.

2

3

When one object rubs or slides against another, it slows down. The energy is changed from moving (kinetic) energy to heat energy. For example when you rub your hands together, your hands get warm.

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Vocabulary

Friction

The resistance that occurs when two objects move against each other.

Barrier

Something that prevents movement.

Lubrication

To apply an oily substance to reduce friction.



Quiz Time

- 1** Complete the sentence.
Friction always _____
- (a) Helps the relative motion (b) Opposes the relative motion
(c) Both (a) and (b) (d) None of these
- 2** Which one of these characteristics does a smooth surface has?
- (a) Less frictional force (b) More frictional force
(c) Sometimes less and sometimes more frictional force
(d) All of the above
- 3** Friction is a _____
- (a) Contact force (b) Non-contact force
(c) Magnetic force (d) None of these
- 4** Using lubricant between two surfaces
- (a) Can increase friction (b) Can decrease friction
(c) May increase or decrease friction (d) None of these
- 5** Fluid are _____
- (a) Gases only (b) Liquids only
(c) Both Gases and liquids (d) None of these



Joke on Friction



① Which shoes have the least friction?

② What do you get when rubbing two oranges together?

Quiz Time

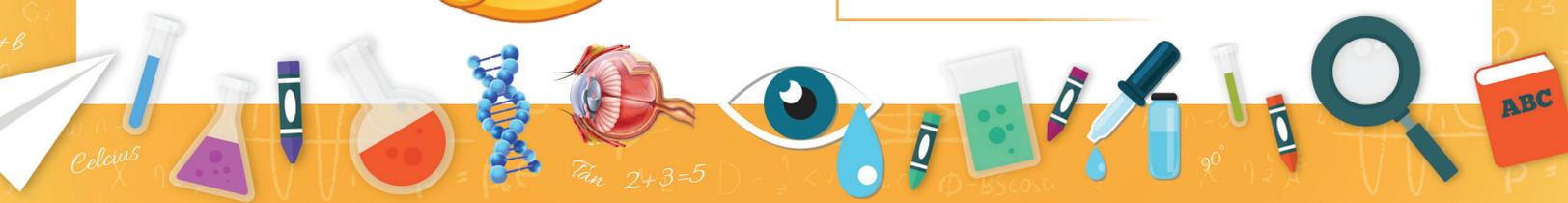
- | | | | |
|---|---------------------------------|---|---------------------------|
| 1 | (b) Opposes the relative motion | 2 | (a) Less frictional force |
| 3 | (a) Contact force | 4 | (b) Can decrease friction |
| 5 | (c) Both gases and liquids | | |

Answer (Joke on Friction)



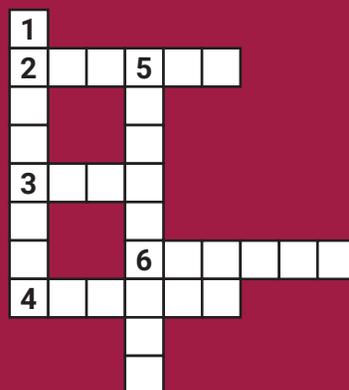
① Slippers

② Pulp friction



Materials : Metals and Non-metals

Crossword



ACROSS

- 2 Compounds of metals/non-metals with oxygen. [6]
- 3 When iron articles are exposed to moist air for long time, they forms _____. [4]
- 4 The arrangement of metals on the basis of their decreasing reactivities is called activity____. [6]
- 6 The property of metals due to which their surface shine. [6]

DOWN

- 1 Metals on hitting, produce ringing sound because they have _____ character. [8]
- 5 The property of metals by which they can be drawn into thin wires. [9]



Interesting Facts

1

The word metal comes from the Greek word 'metallon,' which means quarry or to mine or excavate.

2

Touching stainless steel will remove the odour of garlic and onion from your hands. Even stainless steel "soap" are sold in stores, which are just a bar of stainless steel to rub on your hands.

3

Pure aluminium, which is the most abundant metal in the Earth's crust, was once considered a precious metal worth more than gold, until cheaper methods for separating it out from ore were invented in the 1800s.

4

Research has proven that copper and its alloys, such as brass, have natural anti-microbial properties and can quickly kill viruses and bacteria. Hospitals and food service institutions use these metals (alloys) on frequently touched surfaces, such as door knobs, faucets, hand rails, etc., to help in preventing the spread of disease.

5

The tallest free-standing structures in the world are made of metals, primarily the alloy steel. They include the Dubai skyscraper Burj Khalifa, the Tokyo television tower Skytree and the Shanghai tower Skyscraper.

6

The Eiffel Tower grows six inches taller in the summer as compared to its height in winters because steel and iron expand when exposed to heat.

Quiz Time

1 Which of the following metals is liquid at room temperature?

- (a) Sodium
- (b) Potassium
- (c) Mercury
- (d) Gold

2 Which of the following oxides shows acidic as well as basic behaviour?

- (a) ZnO
- (b) Na₂O
- (c) CuO
- (d) CO₂

3 Chemically rust is

- (a) Hydrated ferric oxide
- (b) Hydrated ferrous oxide
- (c) Anhydrous ferric oxide
- (d) Anhydrous ferrous oxide

4 Which of the following metals is found in native state?

- (a) Sodium
- (b) Platinum
- (c) Zinc
- (d) Iron

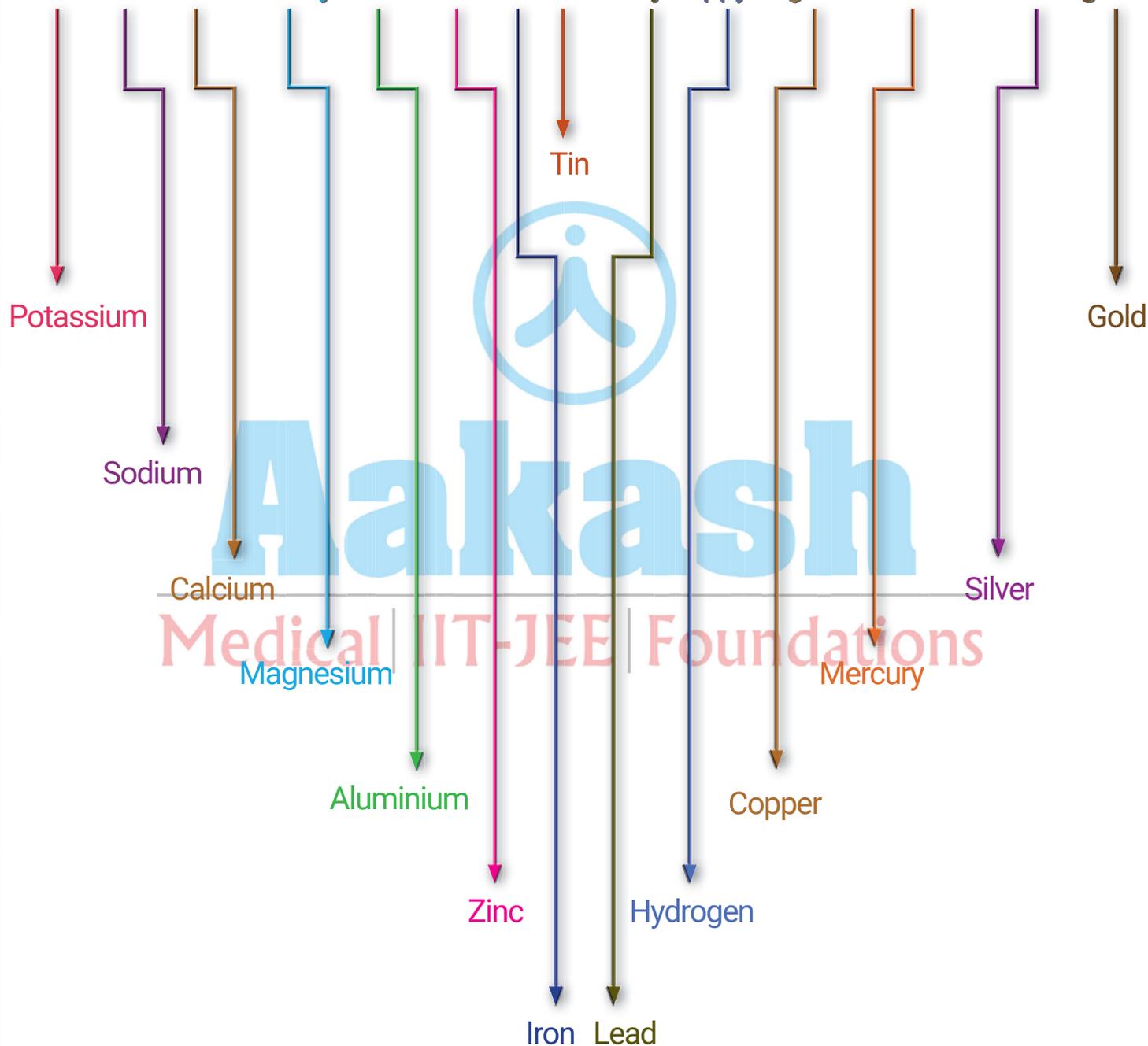
5 Graphite and diamond are _____ of carbon.

- (a) Isotopes
- (b) Allotropes
- (c) Isomers
- (d) Compounds



Mnemonics for the Reactivity Series

Please send cats monkeys and zebras in their lovely happy cages made of silver and gold

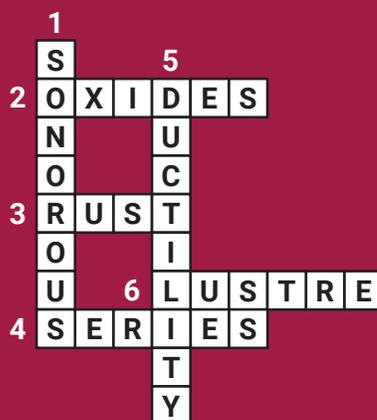


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Answer (Crossword)



Answer (Quiz Time)

- | | | | |
|---|---------------------------|---|--------------|
| 1 | (c) Mercury | 2 | (a) ZnO |
| 3 | (a) Hydrated ferric oxide | 4 | (b) Platinum |
| 5 | (b) Allotropes | | |



Microorganisms : Friend and Foe

Interesting Facts

What is Caterpillar Fungus?



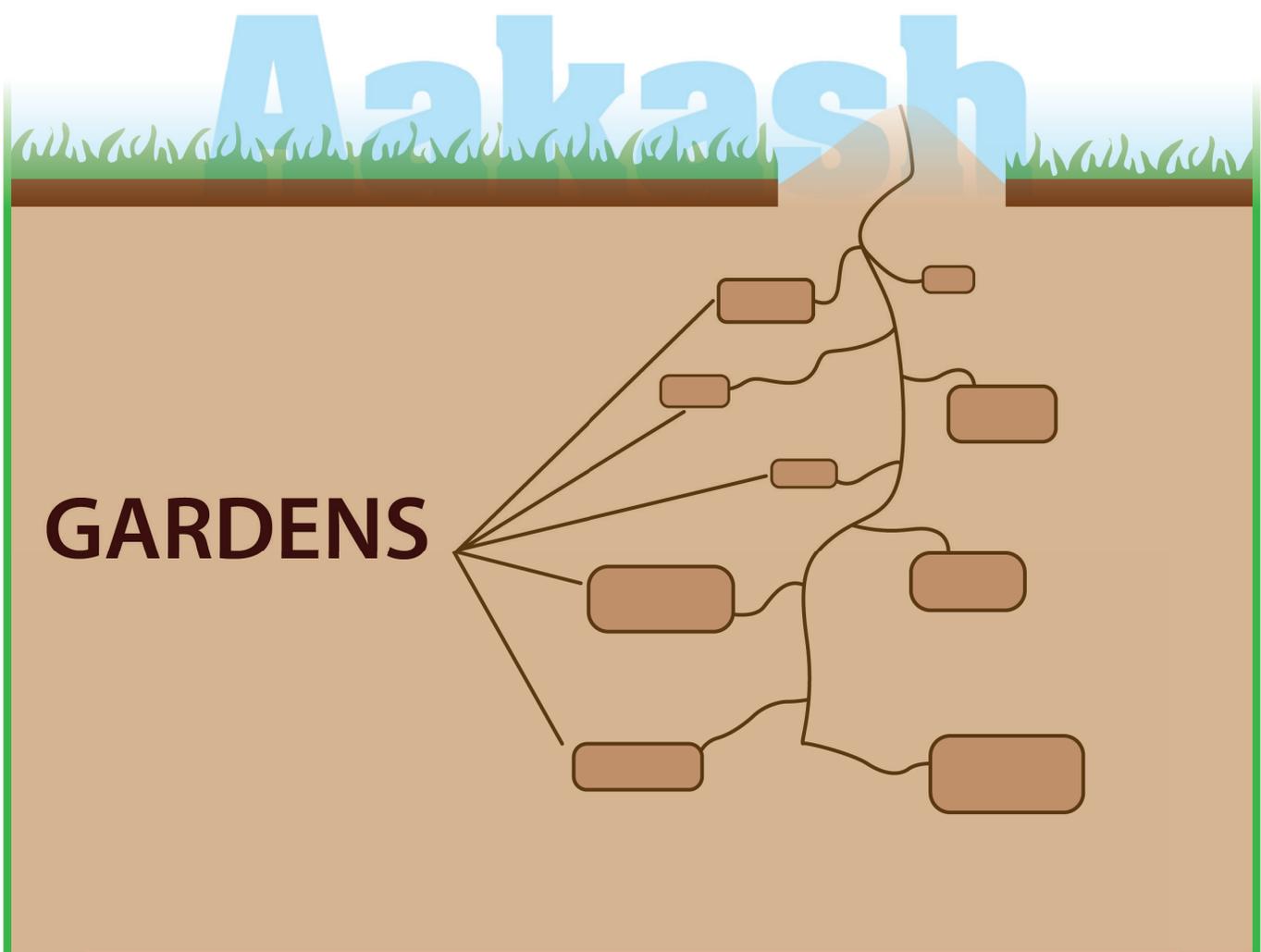
In the old days, Chinese people thought that the caterpillar fungus was nothing but worms. However, after years of study, it was found that actually it is a fruiting body, produced by the fungus, *Cordyceps sinensis*, on dead caterpillars of the moth *Hepilus fabricius*. Spores of *Cordyceps sinensis* grow inside the caterpillars filling the caterpillar with filaments (**hyphae**). When the caterpillar dies the fungus produces a stalked fruiting body that produces spores. The spores are spread in the wind to the next generation of caterpillars.

Today, the caterpillar fungus is mainly used as a tonic to increase strength or for rejuvenation, post long serious injury. They can also reduce stress. The caterpillar fungus is a traditional medicine that has been widely used as a tonic and/or medicine by the Chinese for hundreds of years.



What is an Ant Garden?

The leaf-cutting ants of Central and South America create their food supply by forming a mutually beneficial association with certain fungi. They grow these fungi on gardens created from piles of disks they have cut from living leaves. The ants cannot digest cellulose, (which is a complex molecule found in the cell walls of leaves), but the fungus can. By using cellulose as food for its own growth, the fungus converts the cellulose into simpler carbohydrates. The ants then eat the fungus. Thus, the fungus benefits from a guaranteed food supply. The ants house the beneficial fungus in their nests, supply it with leaves, and remove any invading fungi. Ant nest mounds extend up to three feet underground and nest building raises a huge mound of soil.



The organisms around us, whom we can barely see with our naked eye



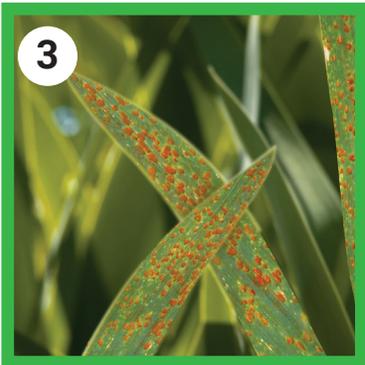
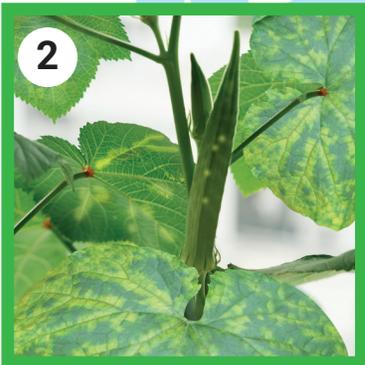
The part of the fungus visible to us is only the fruit of the organism. The living body of the fungus is a *mycelium*, which is made up of a web of tiny filaments known as *hyphae*. The *mycelium* is usually hidden in the wood, soil etc. These webs stay unseen until they develop mushrooms, puffballs or other fruiting bodies. If the *mycelium* produces microscopic fruiting bodies, people may never notice the fungus.

Most fungi's cell wall is made out of chitin. This is the same material as the hard outer shells of insects. Plants do not make chitin. Fungi feed by absorbing nutrients from the organic material in which they live. They do not have stomach. Hence, they must digest their food before it can pass through the cell wall into the hyphae. Hyphae secrete acids and digestive enzymes that break the surrounding organic material down into simple molecules which they can easily absorb. Fungi have evolved to use a lot of different items for food. Some are decomposers living on dead organic material like leaves. Some fungi cause diseases by using living organisms for food.

Like two different faces of the coin, fungi do not only have a harmful side, they are also used in preparing drugs (medicines) to cure diseases and stop the rejection of transplanted hearts and other organs.



Match the following



(a)
Yellow vein mosaic
of bhindi

(b)
Rust of wheat

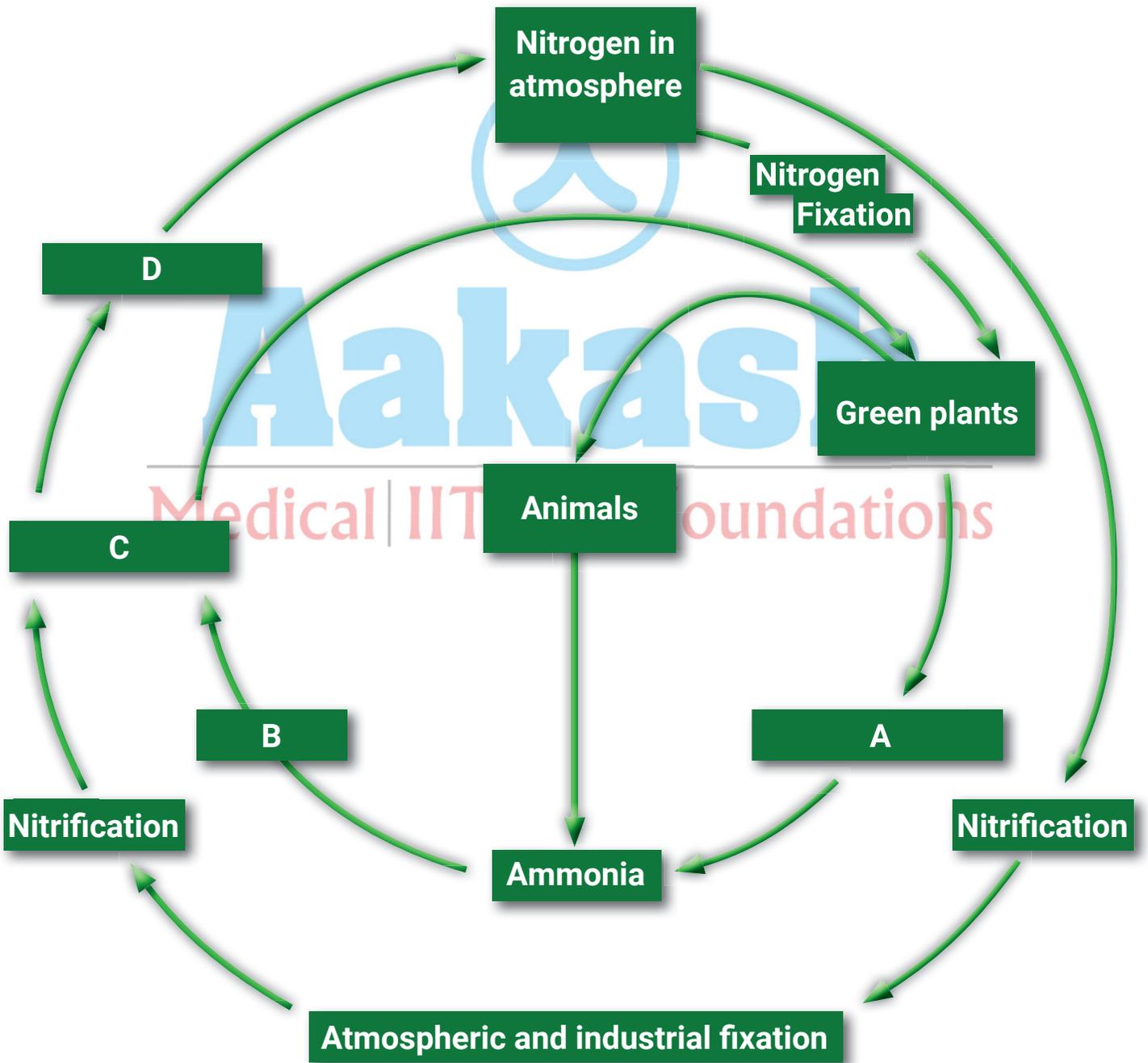
(c)
Tobacco mosaic

(d)
Citrus canker



Fill in the blanks

Find out A, B, C, D



Puzzle (Baffling Bugs)

In this puzzle you have to search for some of our friendly as well as some of our enemy microbes.

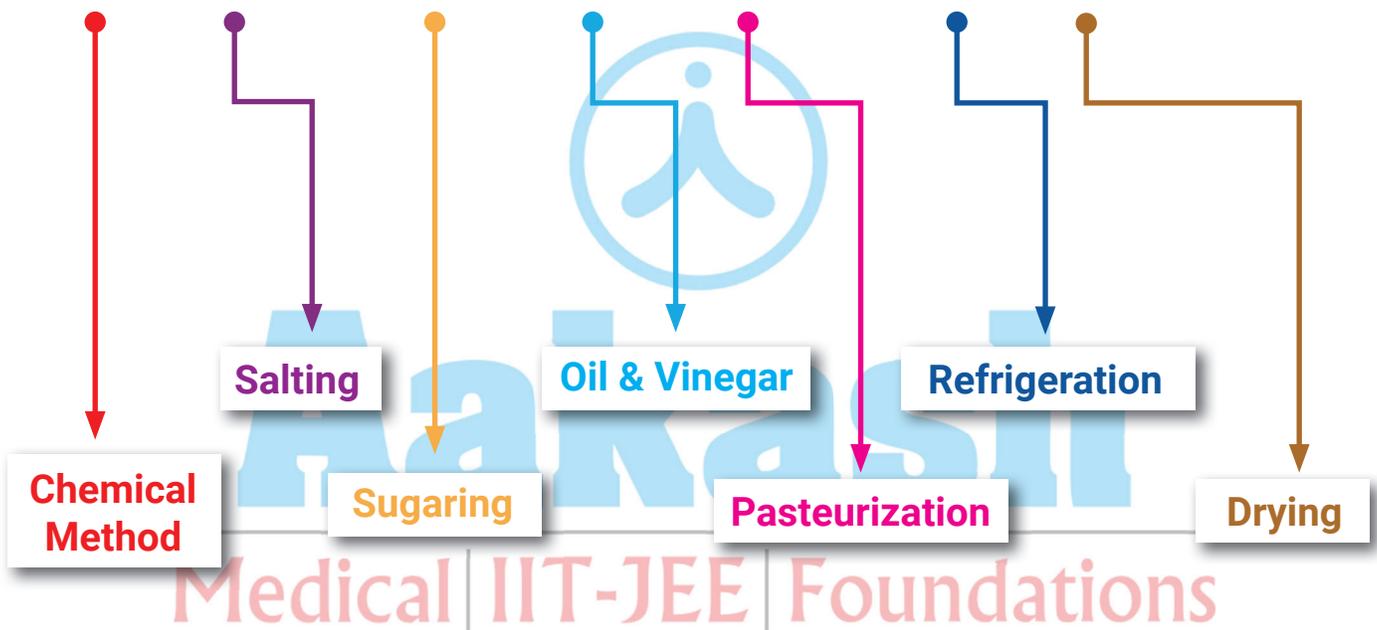
- 1 I'm a slipper-shaped organism, with hair like cilia all over my cell.
- 2 I am a rod-shaped bacterium, just like the one in your curd.
- 3 I can spoil your bread even within the packet, my spores can germinate anywhere I inhabit.
- 4 I am the comma-shaped bacterium, that can cause cholera.
- 5 I am not a plant but I can do photosynthesis, I am not an animal but I can be heterotrophic. I am a protozoan with long whip-like flagella, you can call me holozoic.
- 6 I am a unicellular fungus that can help you make your bread fluffy.
- 7 Using this process, a microbe can make wine from grapes.
- 8 I live in the root nodules of Peas & Grams; I can fix the nitrogen in the soil for these plants.
- 9 I am a virus that causes paralysis of lower body in infants. Two drops of oral vaccine can save you from me, if only you listen to Amitabh Bachchan ji.

Y	R	S	K	L	Y	E	A	S	T	K	V	S
B	A	C	I	L	L	U	S	U	P	Q	I	H
X	C	V	U	B	N	M	A	Z	O	T	B	L
K	E	U	G	L	E	N	A	S	L	E	R	K
F	G	H	V	J	K	L	P	S	I	T	I	P
R	H	I	Z	O	P	U	S	I	O	A	O	I
H	L	M	A	K	L	J	O	K	K	N	T	U
M	N	P	A	R	A	M	O	E	C	I	U	M
L	E	I	P	J	J	A	L	I	K	S	I	P
G	F	E	R	M	E	N	T	A	T	I	O	N
Q	H	D	E	N	G	K	E	L	G	H	K	H
D	J	C	R	H	I	Z	O	B	I	U	M	F

Mnemonics

Remindful Ruses

Can **S**hilpa **S**ew **O**nly **P**retty **R**ed **D**resses?

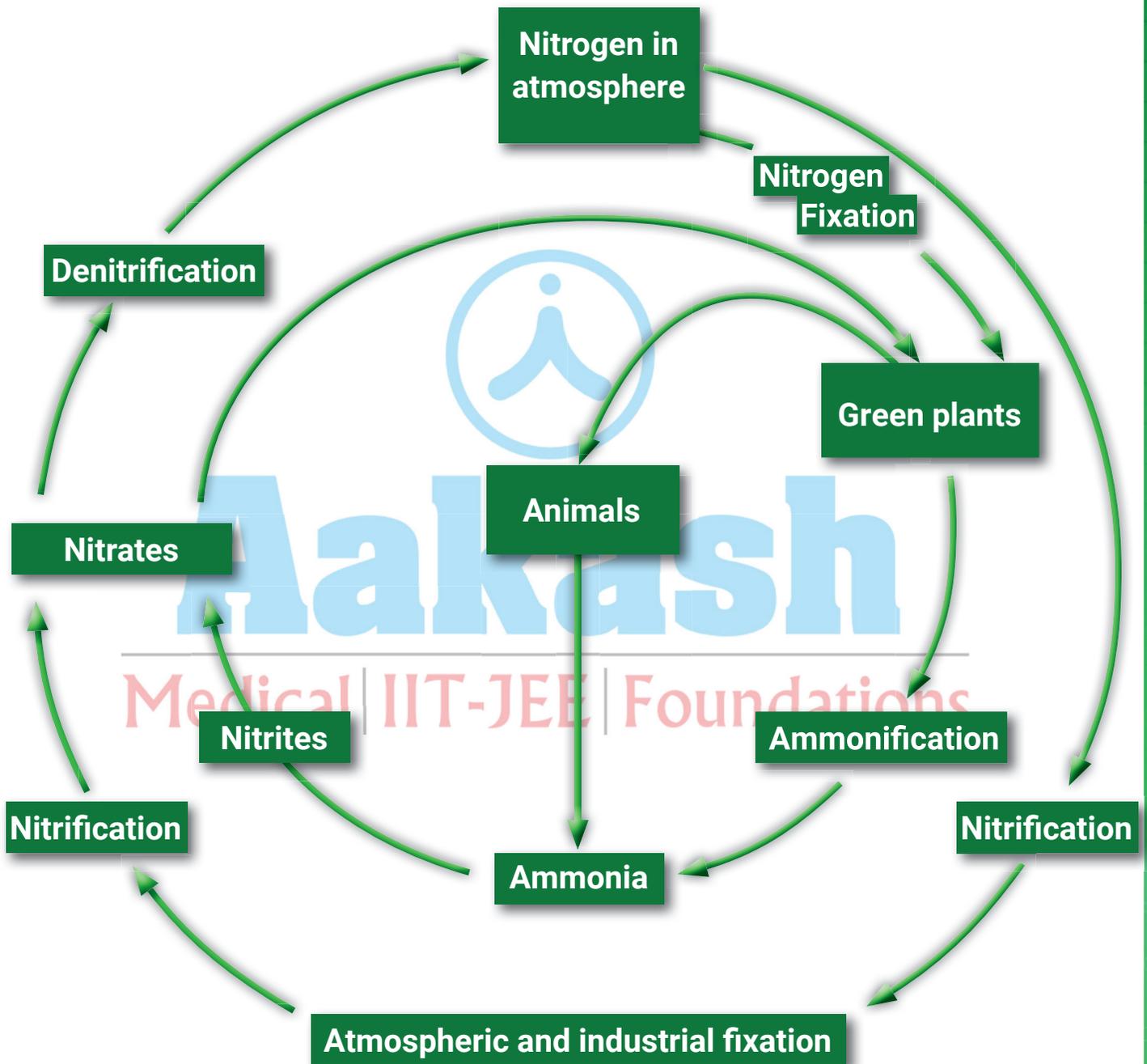


Answer (Match the following)

- | | | |
|---|---|-----|
| 1 | → | (d) |
| 2 | → | (a) |
| 3 | → | (b) |



Answer (Fill in the blanks)



Answer (Puzzle)

Y	R	S	K	L	Y	E	A	S	T	K	V	S
B	A	C	I	L	L	U	S	U	P	Q	I	H
X	C	V	U	B	N	M	A	Z	O	T	B	L
K	E	U	G	L	E	N	A	S	L	E	R	K
F	G	H	V	J	K	L	P	S	I	T	I	P
R	H	I	Z	O	P	U	S	I	O	A	O	I
H	L	M	A	K	L	J	O	K	K	N	T	U
M	N	P	A	R	A	M	O	E	C	I	U	M
L	E	I	P	J	J	A	L	I	K	S	I	P
G	F	E	R	M	E	N	T	A	T	I	O	N
Q	H	D	E	N	G	K	E	L	G	H	K	H
D	J	C	R	H	I	Z	O	B	I	U	M	F



Women, Caste and Reform

Women have been at the centre of discussion for a while. It is because of their position in social, economic and political life.

Although the condition of women has improved, there is still a long way to go.

Comparison of the condition of women in ancient time to the present time:

Women in ancient time:

Women during the Vedic period enjoyed equal status with men in all aspects of life.

- They had the right to select their husband through “Swayamvar”.
- Women were educated in ancient times.
- Women were the head of the village and held a reputed and dignified position.
- However, this scenario has changed with time.
- We have observed a decline in the position of the women.



- The work has been classified on the basis of gender which means that the household activities has to be done by the women and the outside work has to be done by the men.
- There has been a decline in the social and political status of women.
- Various social evils like Sati, Child marriages etc. crept up in the society.



Condition of women in present times:

At present, although the evil practice like sati does not exist but the society has evolved through a new form of repression like female foeticide, female infanticide, lower sex ratio, less literacy rate for women.

- According to the data published by the Asian Center for Human Rights, an NGO based in New Delhi, India ranks fourth in the world, after Liechtenstein, China and Armenia, in terms of skewed sex ratios at birth.
- In many parts, Indian parents prefer to have sons and find ways to have the girl child aborted before she is born.
- The proportion of women in the highly paid and valued jobs is still very small
- This discrimination against girls at birth also leads to multiple problems like less literacy rate. According to the 2011 census, the female literacy rate is 65.46% as compared to the men's literacy rate which is 82.14%.
- The participation of women in the highest decision-making office that is the Parliament is also very less. In the 17th Lok Sabha election, just 78 women were elected out of 543 seats.



Way Forward:

- Increase the role of Self Help Groups in socio-economic empowerment of women.
- Reduce the cases of female foeticide, female infanticide, child marriage by strict implementation of the laws.
- More employment opportunities for women in rural as well as urban areas.
- Focus on health and sanitation measures for women on regular basis in rural as well as urban areas.
- Increase the awareness at the rural and urban levels about the discrimination against women.



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Answer (Quiz Time)

1 (b) 78

2 (c) 82.14%

3 (a) 943

4 (a) New York

5 (d) None of these



Determiners

Determiners are words that are used before Noun(s) and Noun Phrase(s). It is necessary to use Noun/Noun phrase just after them.

Fill in the Blanks with the most appropriate determiner from the given options.

1 _____ unemployed are often neglected in our country.

- (a) Few
- (b) An
- (c) Most
- (d) The

2 Last year, they visited _____ Lake Mansarovar.

- (a) the
- (b) any
- (c) a
- (d) this

3 There is _____ milk in the pot.

- (a) none
- (b) many
- (c) some
- (d) few

4 There was some problem in _____ left eye.

- (a) a
- (b) an
- (c) the
- (d) her



- 5 _____ water is left in the pond.
- (a) A little (b) The little
(c) Few (d) Most
- 6 Swasti has three winter coats, but _____ of them are new.
- (a) none (b) neither
(c) either (d) one
- 7 There were _____ students who raised doubts after the presentation.
- (a) more (b) most
(c) several (d) neither
- 8 Are there _____ players in the playground?
- (a) no (b) any
(c) many a (d) none
- 9 The factory workers won't end the strike till the management accepts _____ demand of the union.
- (a) each (b) every
(c) all (d) both
- 10 _____ restaurants don't accept cash these days.
- (a) Few (b) No
(c) Some (d) Little

Answer

- 1 (d) 2 (a) 3 (c) 4 (d) 5 (a)
6 (a) 7 (c) 8 (b) 9 (a) 10 (c)

Ranking Test

Quiz Time

- 1 Veer Das ranks 7th from the top and 28th from the bottom in a class. How many students are there in the class?
- (a) 32 (b) 33 (c) 34 (d) 35
- 2 During assembly the students are standing in a line. Salman is 21st in order from both the ends. How many students are there in the line?
- (a) 31 (b) 41 (c) 40 (d) 30
- 3 Hritik is 7 ranks ahead of Aamir in a class of 39. If Aamir's rank is 17th from the last. What is Hritik's rank from start?
- (a) 10th (b) 12th (c) 15th (d) 16th
- 4 Pariniti ranked 17th from the top and 28th from the bottom among those who made it to the final round of Miss India Contest. 7 girls did not participate in the competition and 7 failed in the previous round. How many girls enrolled in the contest?
- (a) 55 (b) 56 (c) 57 (d) 58



5 Raji is 5 ranks ahead of Raj in a class of 46 students. If Raj's rank is 12th from the last, what is Raji's rank from the start?

- (a) 29th (b) 31st (c) 28th (d) 30th

6 Reshma and Praveena are ranked ninth and thirteenth from the top in a class of 57 students respectively. What will be their respective ranks from the last in the class?

- (a) 48th, 44th (b) 49th, 45th (c) 45th, 49th (d) 47th, 43rd

7 Naresh is twenty second from the left end in a row of 47 boys. What is his position from the right end?

- (a) 24th (b) 25th (c) 23rd (d) 26th

8 Shakti ranks eleventh from start in a class of 54 students. What is her rank from last?

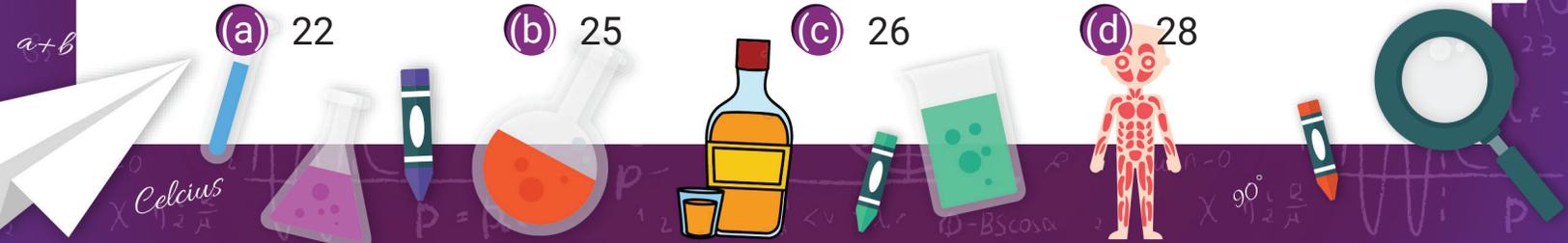
- (a) 43rd (b) 44th (c) 42nd (d) 40th

9 Kanani ranked sixteenth from the top and twenty ninth from the bottom among those who passed an examination. Six boys did not participate in the examination and five failed in it. How many students were there in the class?

- (a) 35 (b) 45 (c) 50 (d) 55

10 In a row of girls, Nithya and Suganya occupy ninth place from the right end and tenth place from the left end, respectively. If they interchange their places, then Nithya and Suganya occupy seventeenth place from the right end and eighteenth place from the left end respectively. How many girls are there in the row?

- (a) 22 (b) 25 (c) 26 (d) 28



Answer (Quiz Time)

1 (c) 34

2 (b) 41

3 (d) 16th

4 (d) 58

5 (d) 30th

6 (b) 49th, 45th

7 (d) 26th

8 (b) 44th

9 (d) 55

10 (c) 26



Happy Birthday

Stephen Hawking

“ The greatest enemy of knowledge is not **IGNORANCE**, it is the **ILLUSION** of knowledge. ”



Born - 8 Jan 1942
Died - 14 Mar 2018

Stephen Hawking was born in Oxford, England on January 8, 1942. He grew up in a highly educated family. Both of his parents had attended Oxford University and his father, Frank, was a medical researcher.

Hawking's contributions to physics earned him many exceptional honours. In 1974 the Royal Society elected him one of its youngest fellows. He became professor of gravitational physics at Cambridge in 1977, and in 1979 he was appointed to Cambridge's Lucasian professorship of mathematics, a post once held by Isaac Newton.

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...