



Aakash

Medical | IIT-JEE | Foundations

KNOWLEDGE BYTES

MAY 2025

CLASS 8





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Medical | IIT-JEE | Foundations

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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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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

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

? 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

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%	$P \left(\frac{5}{4}\right)^n$	$P \left(\frac{9}{8}\right)^{2n}$	$P \left(\frac{17}{16}\right)^{4n}$



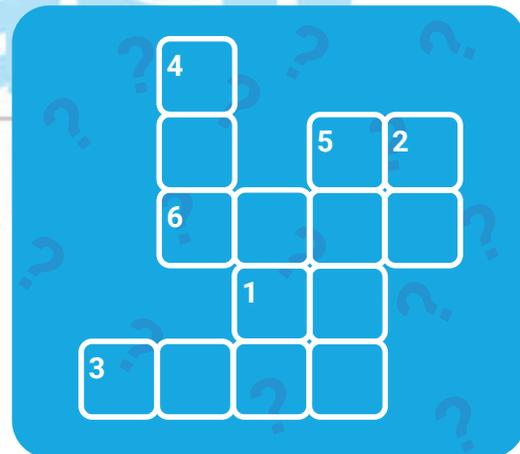
If two successive discounts are offered such that the 1st discount is $x\%$ and 2nd discount is $y\%$, then the total discount (in %)

$$\text{Total discount (in \%)} = \left(x + y - \frac{xy}{100} \right) \%$$

Crossword

ACROSS

- The cost price of a pencil, if $SP = ₹ 6000$ and profit is 20% , is
- If $x : 80 :: 1680 : 120$, then the value of x is

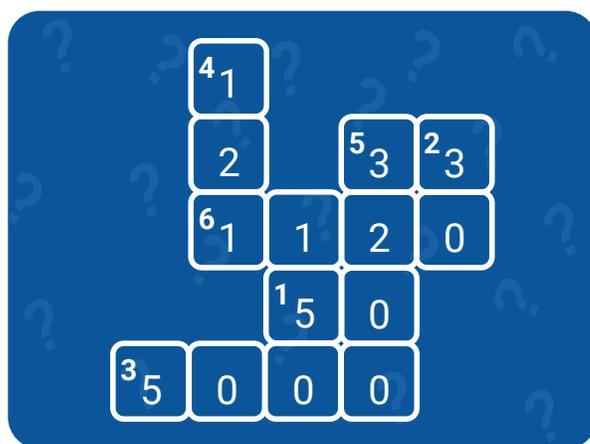


DOWN

- $33\frac{1}{3}\%$ of 150 is
- The profit (in %) earned by selling an article worth ₹ 500 for ₹ 650 is
- If the principal = ₹ 100, $R = 10\%$, $T = 2$ years and interest is compounded annually, then the final amount (in ₹) is
- 25% of 50% of 25600 is



Answer (Crossword)



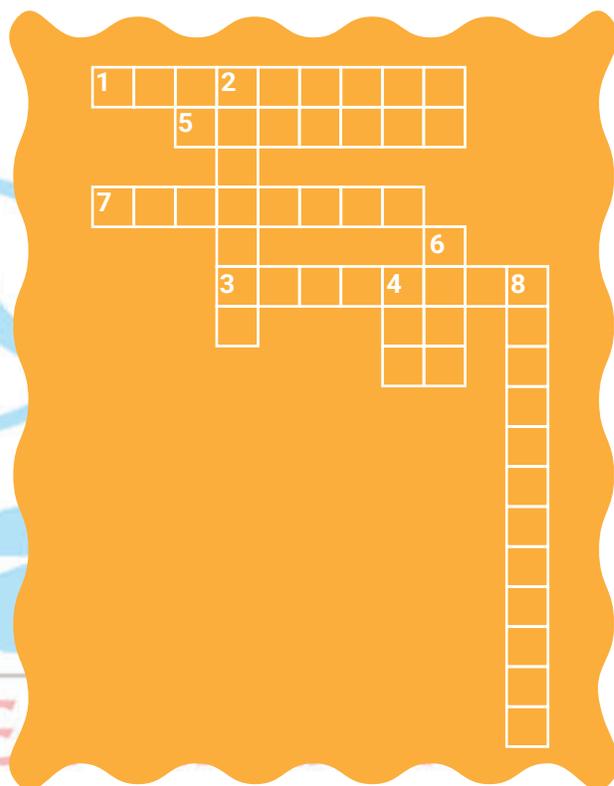
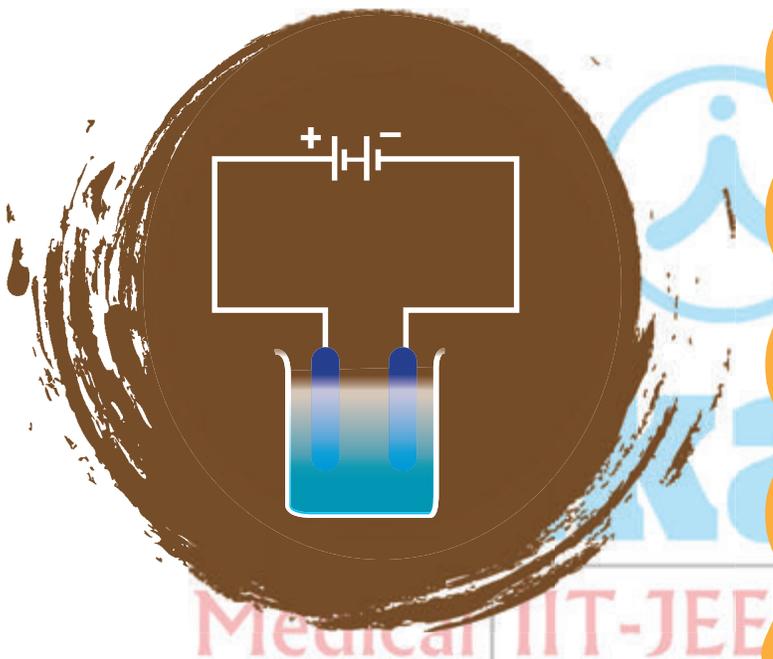
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Chemical Effects of Electric Current

Crossword



Across

1. In metal _____ are responsible for the conduction of electricity.
3. Anion carries _____ charge.
5. The article which is to be electroplated is made the _____.
7. The larger lead of a LED is connected to _____ terminal of battery.

Down

2. _____ are positively charged ions.
4. Cans, used for storing food are made by electroplating _____ onto iron.
6. To protect iron from corrosion and rusting it is electroplated with _____.
8. The process of chemical decomposition of a liquid by passing an electric current is called _____.



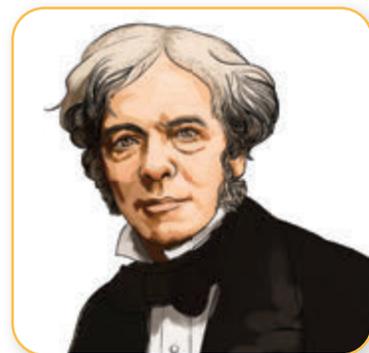
Scientists Info and Contribution

Michael Faraday

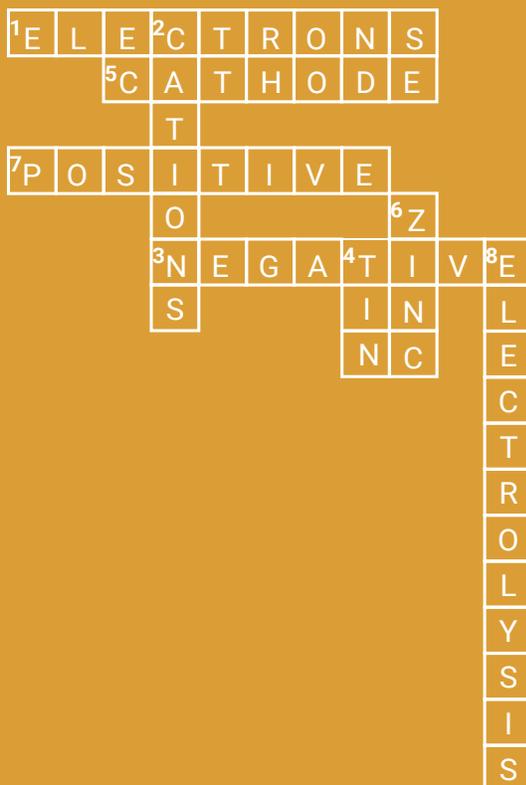
Faraday is most famous for his contribution to the understanding of electricity and electrochemistry.

Faraday discovered the two laws of electrolysis :

1. The amount of chemical change or decomposition is exactly proportional to the quantity of electricity that passes in solution.
2. If the same amount of electricity is passed through different electrolytes, the masses of ions deposited at the electrodes are directly proportional to their chemical equivalents.



Answer (Crossword)



Coal and Petroleum

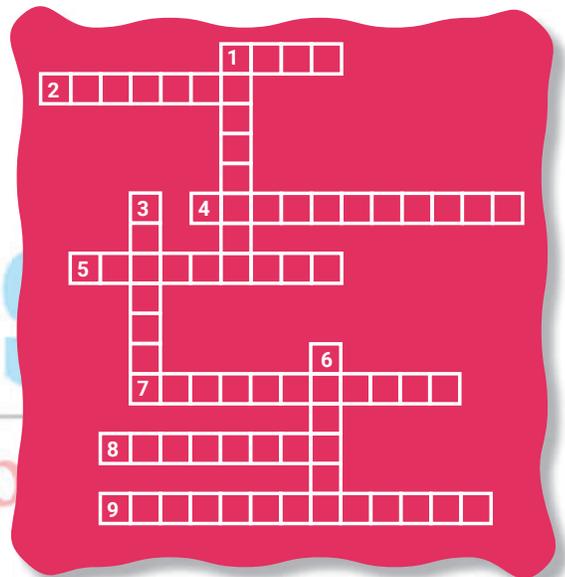
Crossword

ACROSS

1. A pure form of coal. [4]
2. A black, thick liquid with an unpleasant smell. [7]
4. Fuels formed from the dead remains of plants and animals. [11]
5. Petrol and diesel are obtained from a natural resource called _____. [9]
7. "Wind mills" are used to generate _____ from wind. [11]
8. The process of separating crude oil into useful fractions is called _____. [8]
9. The formation of coal from carbon content of dead plants. [13]

DOWN

1. Liquefied form of dead organic matter. [8]
3. The main constituent of natural gas is _____. [7]
6. _____ is obtained by decomposition of biomass. [6]



Facts About Coal

Coal mining can damage ground and surface water.

Coal is one of the most abundant energy sources in the entire world.

Coal is so called "dirty" energy source because of its negative effects on the environment

Facts About Coal

The ash that is a by-product of coal combustion is used as fillers for things such as tennis rackets, golf balls and linoleum.

Burning coal is ecologically unacceptable due to its significant contribution to greenhouse gas (CO₂) emissions and global warming.

The energy we get from coal today comes from the energy that plants absorbed from the sun millions of years ago.



Find the Fossil Fuel

?

There is probably enough of this fossil fuel to last another 200 years.

?

Started out as plankton (tiny plants and animals) millions of years ago.

?

In its early stages this fossil fuel is a spongy brown material called peat.

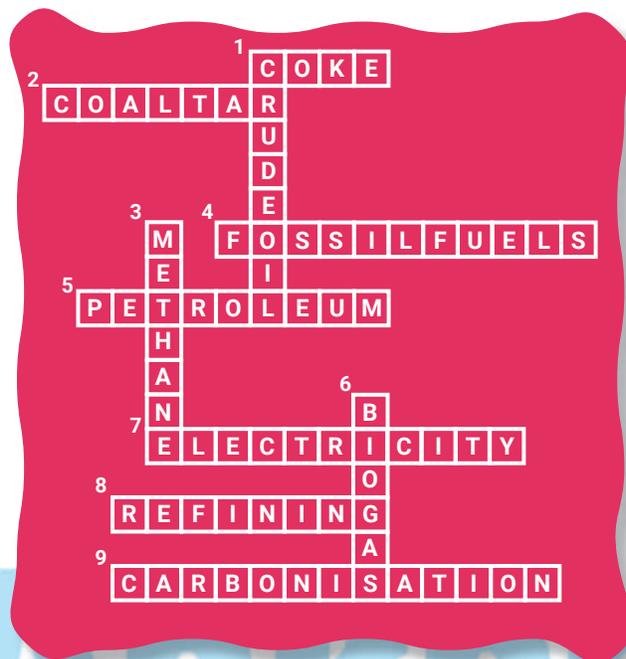
?

Use of these fossil fuels contributes to global warming.

?

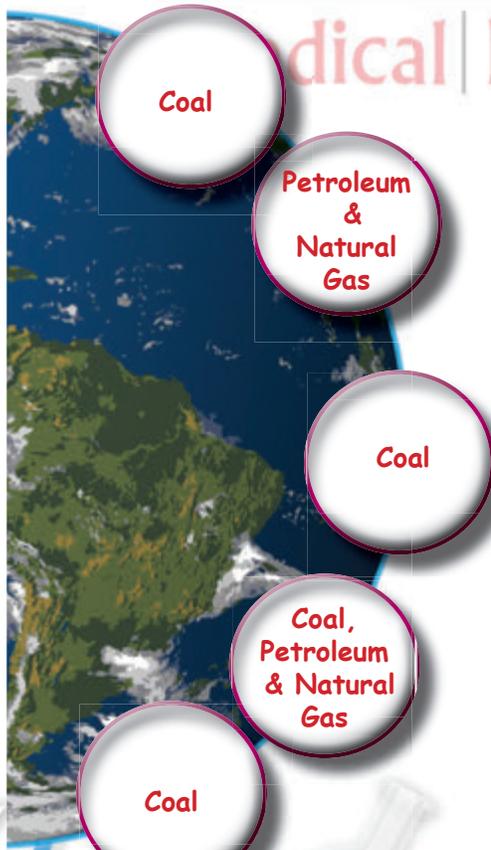
This fossil fuel provides about 40% of the world's electricity.

Answer (Crossword)



Answer (Find the Fossil Fuel)

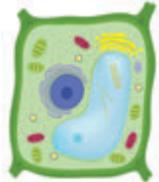
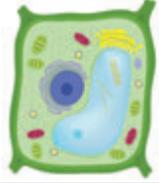
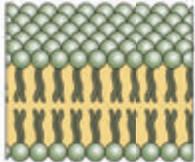
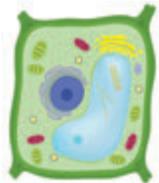
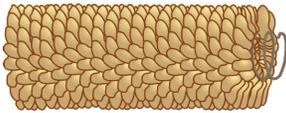
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Cell- Structure & Functions

The Cellular Alchemy!!

God is the biggest alchemist who has made different organisms using different combinations of cellular components.
Can you guess correctly ?

1.		-		+		=	<input type="text"/>
2.		+		+		=	<input type="text"/>
3.		+		-		=	<input type="text"/>
4.		+		-		=	<input type="text"/>
5.		+		=	<input type="text"/>		

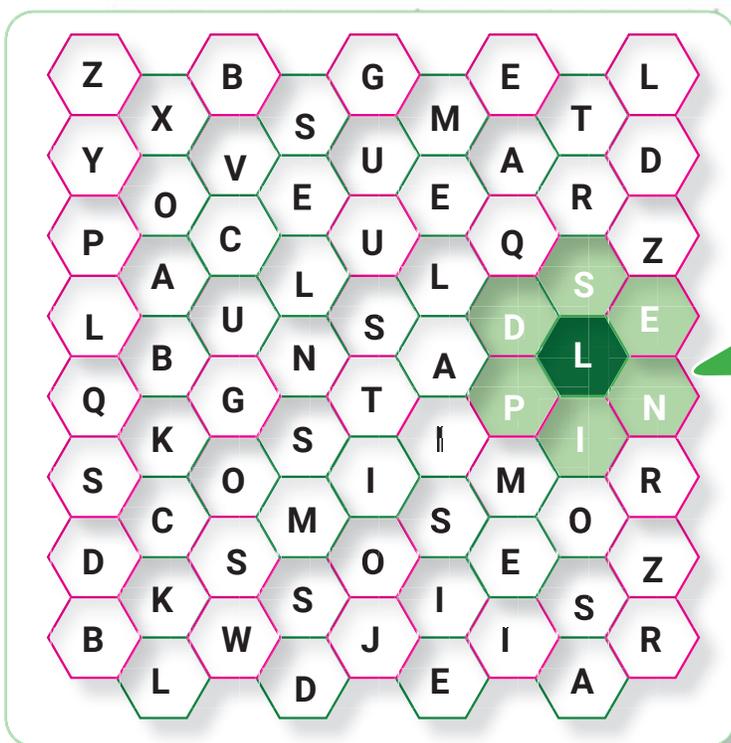




What's Under the Hooke's Microscope?

Instructions: In this honeycomb, you have to find some 7 lettered words based on the clues given below. Search the word in the puzzle and then shade the letter in the central hexagon. First one has been done for your reference. All shaded letters together can help Robert Hooke make his discovery.

1. I'm the shape of your smooth muscle cell: SPINDLE
2. I'm the organelle that maintains your plant's water level.
3. I store the paints of the plant world.
4. I'm the phenomenon that makes the raisins swell and the grapes shrink.
5. I carry your genes to the next generation.
6. I'm the magic that multiplies your cells, heals your skin, & grows your hair.
7. I am the nature's trick behind the gamete formation.



The shaded letter L and the 6 letters surrounding the hexagon are forming the word SPINDLE. Find the remaining 7 lettered words in this puzzle, arranged in similar hexagonal arrangement.

Unscramble the shaded letter to fill this





Micro-Maestro

When Robert Hooke saw the cells under the microscope, he had no idea of what lay ahead of him. He had just discovered the one type of these petite prodigies which continue to astonish us till date. Wanna know what they can do, apart from building you and the world around you? Let's find out!

Cells can be the largest!

Caulerpa taxifolia (Algae) is the world's largest single-celled organism, can grow to a length of six to twelve inches.



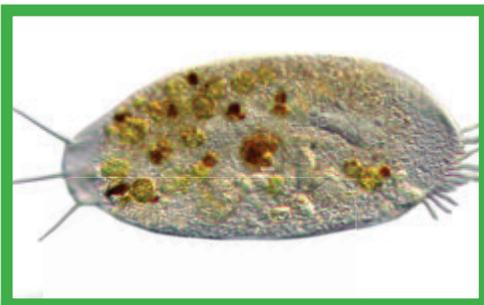
Cells can be the smallest!

Ostreococcus tauri (Algae) is the smallest free-living eukaryote which has only one organelle each!!



Cells can walk!

Stylonychia is a protozoan that can walk!



Cells that can digest other cells!

Here is a *Didinium* ingesting a *Paramecium*.



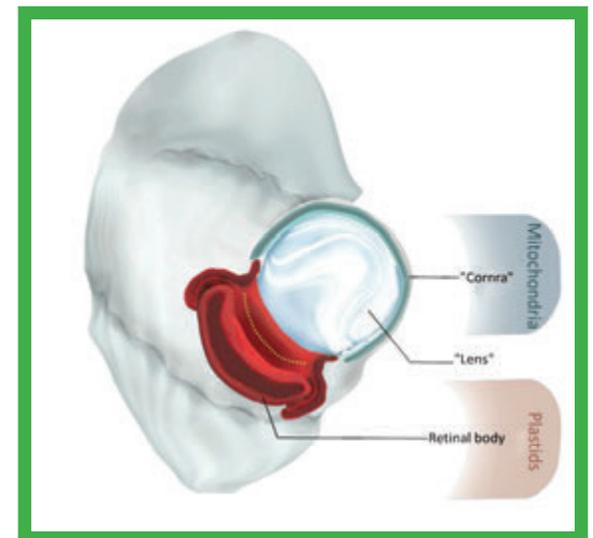
Cells that can solve mazes!

Physarum polycephalum is a syncytial slime mold, that can solve complex problems, for example finding the shortest route between food sources kept on 2 ends of a maze.



Cells that can see!

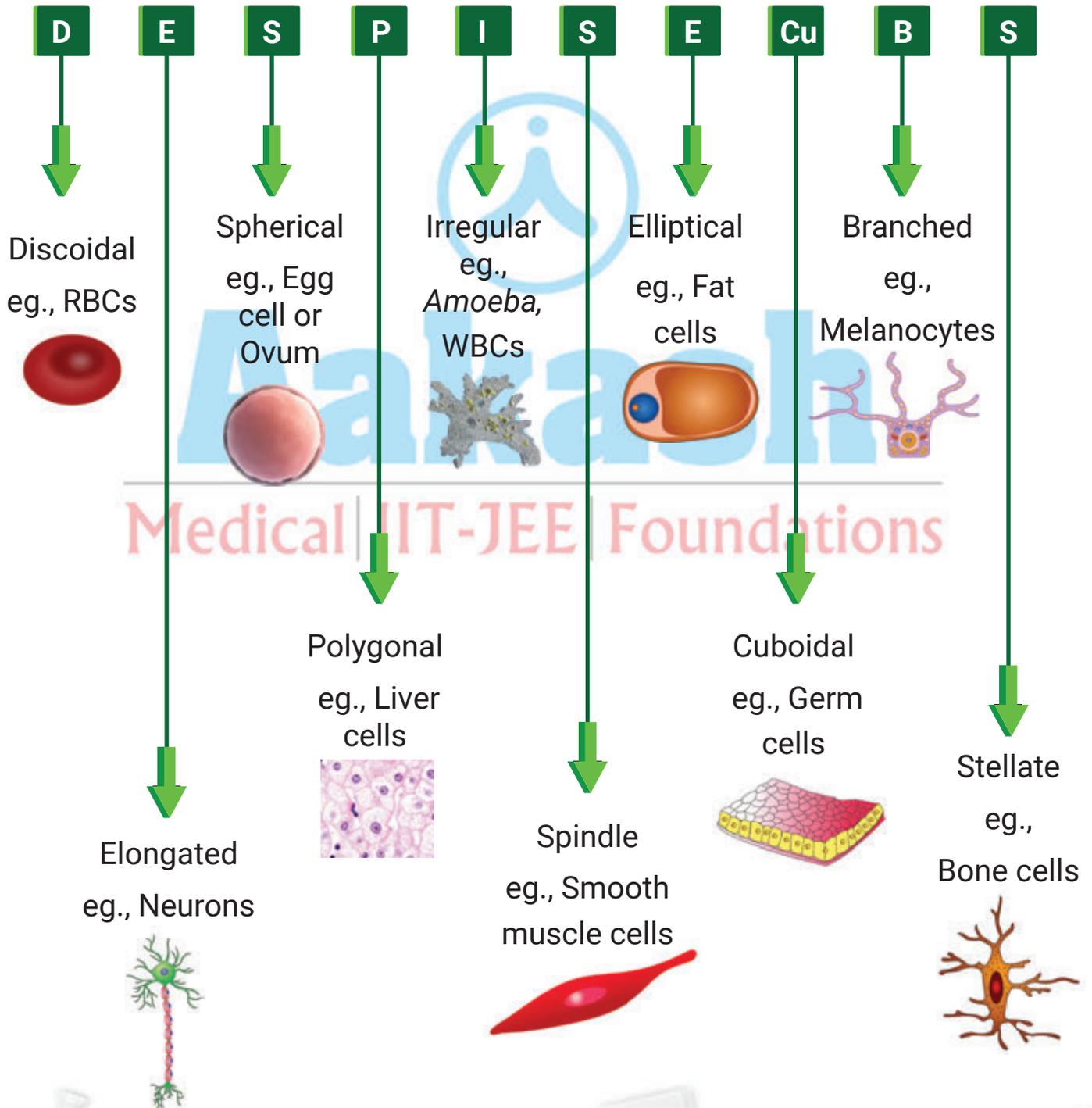
Warnowia is a single celled organism that can see & has a camera lens kind of structure called ocelloid in them.





Mnemonics

Despise Cubs



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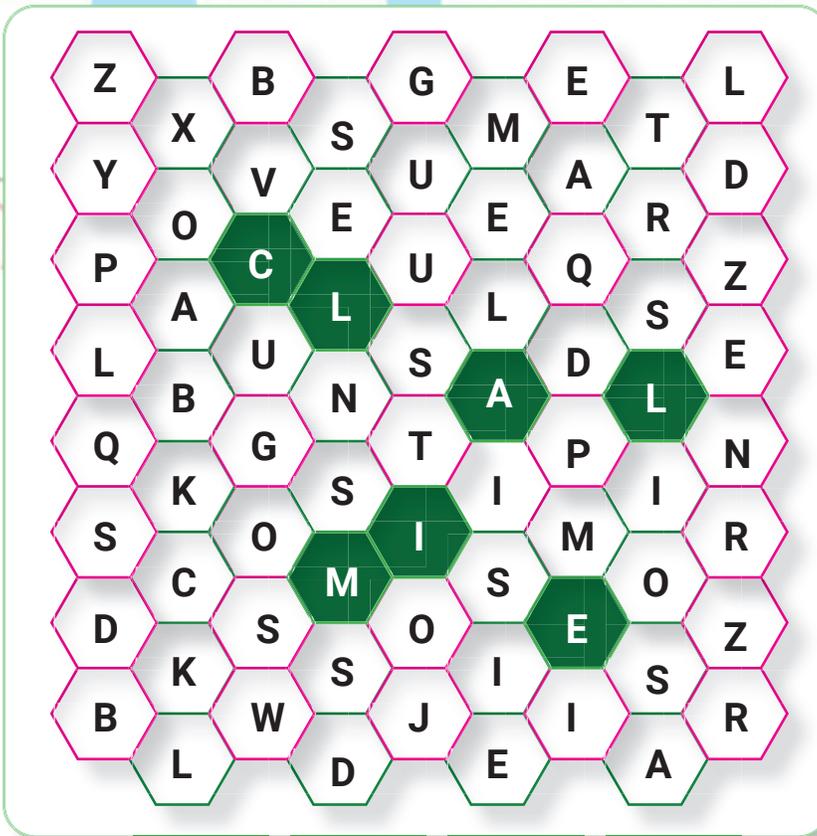
Answers (The Cellular Alchemy!!)

- | | |
|-------------|-----------------|
| 1. Bacteria | 2. Plant/ Algae |
| 3. Protozoa | 4. Fungi |
| 5. Virus | |



Answers (What's Under the Hooke's Microscope)

- | | |
|------------|------------|
| 1. Spindle | 2. Vacuole |
| 3. Plastid | 4. Osmosis |
| 5. Nucleus | 6. Mitosis |
| 7. Meiosis | |



Hooke saw under the Microscope **I A M C E L L**

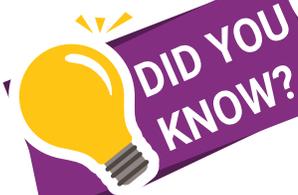


Tropical Storms and Cyclones

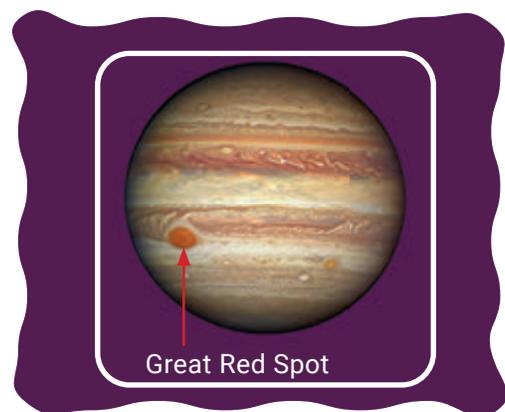
Introduction

There are the low pressure region on earth/oceans with the winds spiraling inwards where there is an irregular movement of the wind around the low pressure region. This air circulation called cyclone is a result of rapid upward movement of hot air.

Cyclones rotate anti-clockwise in Northern Hemisphere and rotate clockwise in Southern Hemisphere. This phenomenon is because of the Coriolis force of the earth.



Cyclones are found not only on the earth but also on the various planets as well. For example Great Red Spot is the hurricane on Jupiter which is going on from the past 340 years.

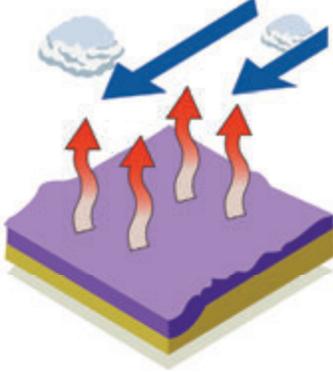


Change of "Tropical Storms" into "Cyclones"

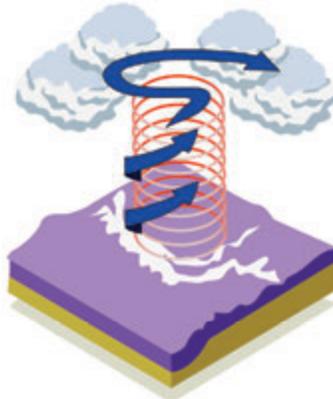
How tropical storms are formed

High humidity and ocean temperatures of over 26°C are major contributing factors

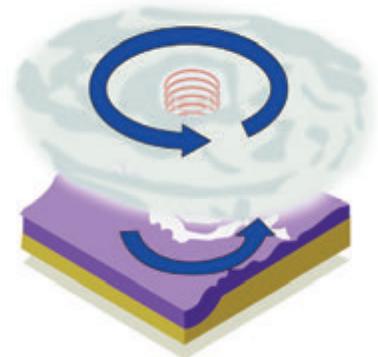
Water evaporates from the ocean surface and comes into contact with a mass of cold air, forming clouds



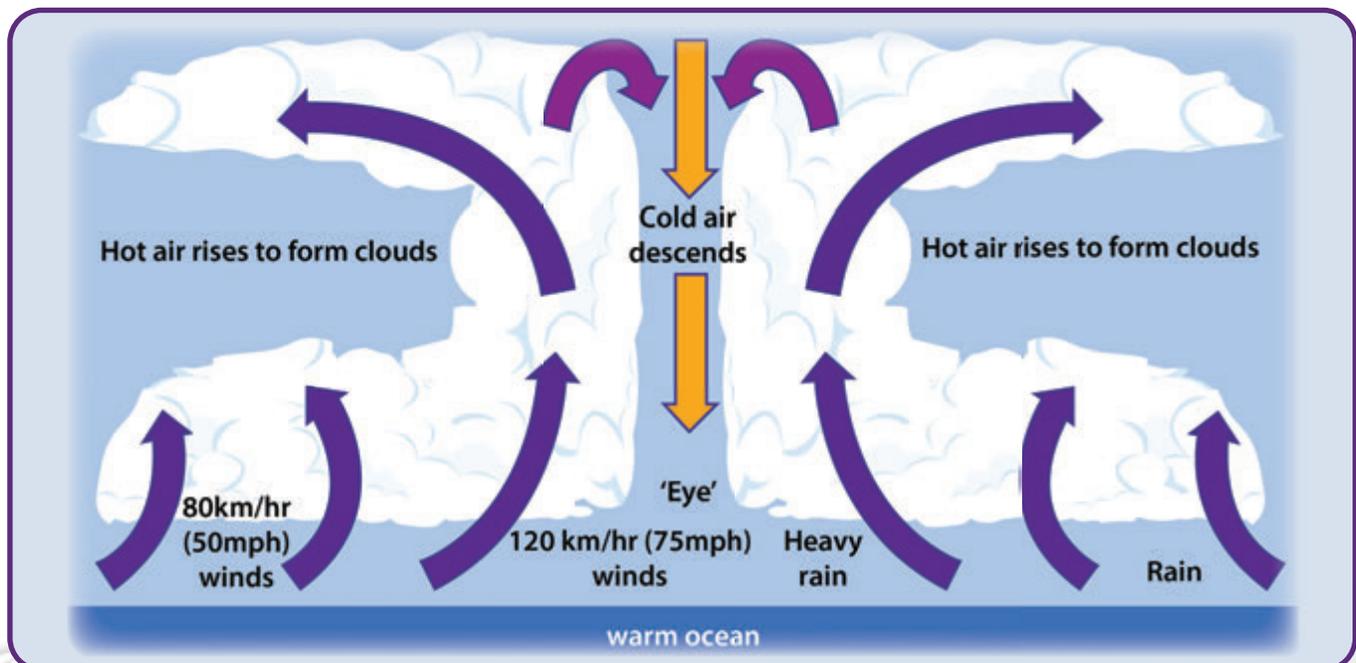
A column of low pressure develops at the centre. Winds form around the column



As pressure in the centre column (the eye) weakens, the speed of the wind around it increases



And, as a result the cyclones are formed.

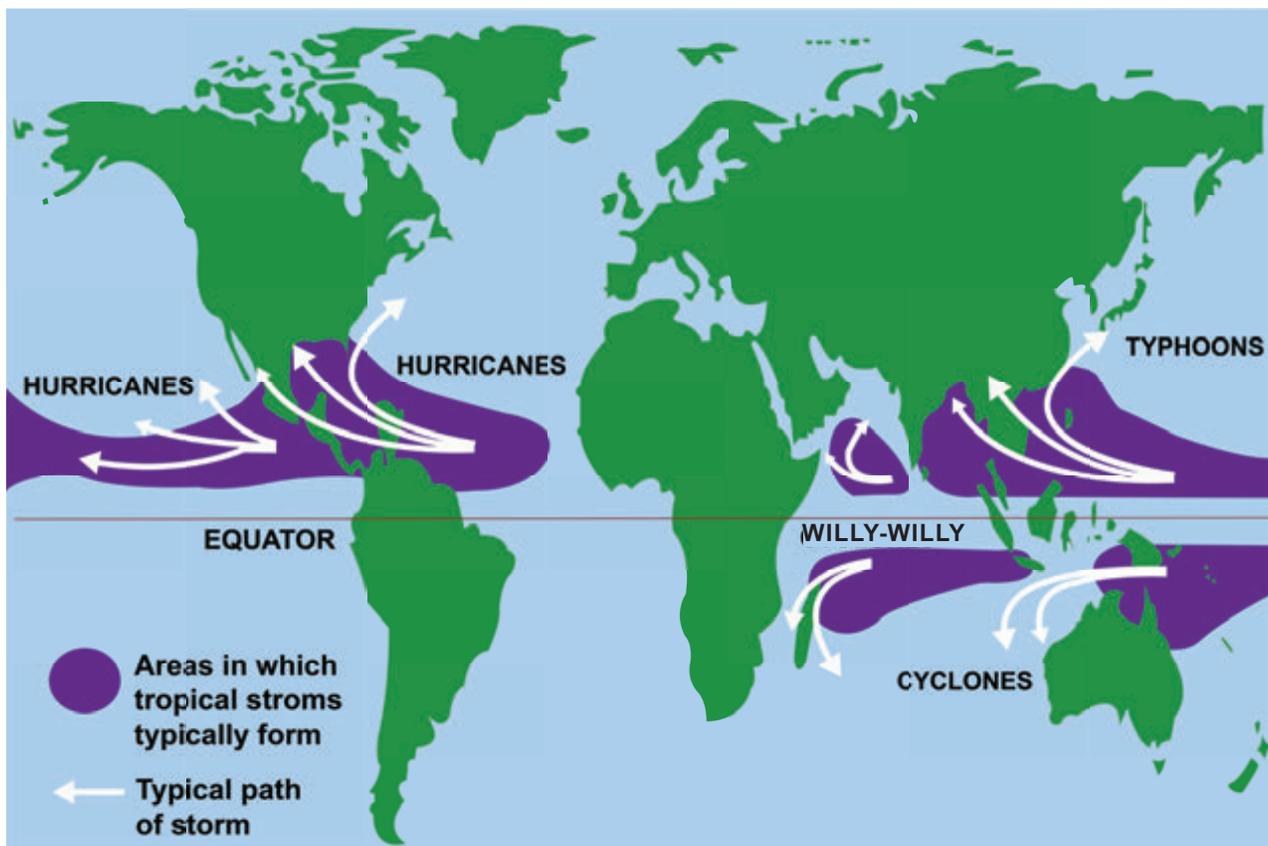




Interesting Facts

The cyclones are known with the different names in different parts of the world.

- 😊 **Cyclones** in the Indian Ocean
- 😊 **Hurricanes** in the Atlantic Ocean
- 😊 **Typhoons** in the Western Pacific and the South China Sea
- 😊 **Willy-Willy** in Western Australia



Voice Change

Verbs are said to be either ACTIVE or PASSIVE in VOICE. In ACTIVE VOICE sentences, the subject performs the action stated by the verb.

In PASSIVE VOICE sentences, the subject is acted upon by the verb.

Example:

Active

The crew paved the entire stretch of highway.

Passive

The entire stretch of highway was paved by the crew.

General Rules to TRANSFORM VOICE

- Rule 1.** The object of the sentence in Active voice becomes the subject of the sentence in Passive voice.
- Rule 2.** The subject of the sentence in Active voice becomes the object of the sentence in Passive voice.
- Rule 3.** The Passive voice contains the third form of the main verb.
- Rule 4.** The form of the verb is chosen according to the tense of the sentence.
- Rule 5.** Only transitive verbs can be changed into Passive voice.
- Rule 6.** In passive voice, helping verb is placed before the main verb.
- Rule 7.** In passive voice, preposition is placed before the object of the sentence, which was earlier the subject in active voice.

Example:

I	eat	an apple.
(Subject)	(Verb in Active Voice)	(Object)
An apple	is eaten	by me.
(Subject)	(Verb in Passive Voice)	(By + Object)



Tense Change

Tense	Form	Example
Simple Present	is/am/are + past participle	The windows are cleaned by them.
Simple Past	was/were/ + past participle	The car was stolen by a thief.
Present Continuous	is/am/are + being + past participle	The house is being cleaned by her.
Past continuous	was/were + being + participle	The painting was being made by him.
Simple Future	shall/will + be + past participle	The match will be played by them.
Present Perfect	has/have + been + past participle	The park has been renovated by the MCD.
Past Perfect	had + been + past participle	The lock had been broken by Riya.
Future Perfect	will have + been + past participle	The piano will have been played by her.



Change the following sentences into Passive voice :

1. Rohit could lock the door before leaving home.
2. Students are solving the questions.
3. Everyone follows me on Twitter.
4. Kiran reads many books.
5. Vishal has shown the papers.
6. The nurse looks after the patient.
7. Shubh will have written a poem.
8. The President gives him a medal.
9. A lion was chasing a deer.
10. Have they closed the factory?

Answers

1. The door could be locked by Rohit before leaving home.
2. The questions are being solved by students.
3. I am followed on Twitter (by everyone).
4. Many books are read by Kiran.
5. The papers have been shown by Vishal.
6. The patient is looked after by the nurse.
7. A poem will have been written by Shubh.
8. A medal is given to him by the President.
9. A deer was being chased by a lion.
10. Has the factory been closed (by them)?



???



Puzzles



Question-1

Observe the given equations,

$$\text{🍌} + \text{🍌} + \text{🍌} + \text{🍌} = 32$$

$$\text{🚗} + \text{🚗} - \text{🍌} + \text{🍌} = \text{🍌} + \text{🚗} - 5$$

$$\text{🚌} + \text{🚗} - \text{🍌} + 3 = 0$$

$$\text{🍌} \div \text{🚌} \times \text{🚗} + \text{🚌} \div \text{🍌} = 12.5$$

then solve the following

$$\text{🍌} + \text{🚗} + \text{🍌} + \text{🚌} = ?$$

(1) 16

(2) 20

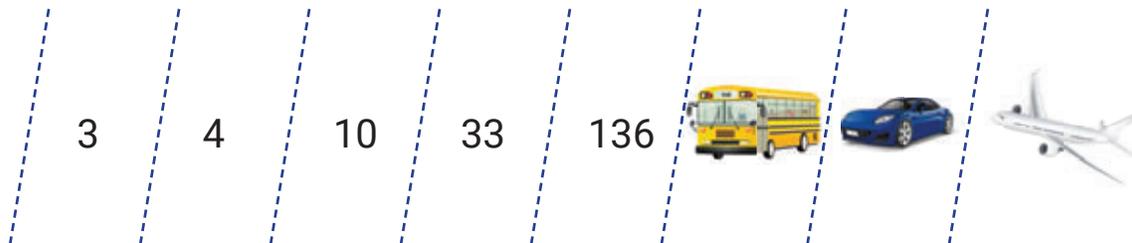
(3) 17

(4) 28



Question-2

Observe the following pattern and find the number on which bus, car and aeroplane are parked respectively.



(1) 685, 4116, 10085

(2) 685, 4116, 28819

(3) 4116, 685, 28009

(4) 685, 785, 10085



Question-3

Find the missing boxes in the following pattern.

The pattern consists of two rows of boxes. Each box is divided into two horizontal sections. The top row shows a sequence of three boxes, followed by a gap, then three more boxes, and finally a question mark followed by a box with one dot in the top section and one dot in the bottom section. The bottom row shows four pairs of boxes labeled (a), (b), (c), and (d).

(1) (a)

(2) (b)

(3) (c)

(4) (d)

Question-4

Complete the pattern.

The pattern consists of two rows of shapes. The top row shows a sequence of three shapes: a small circle, a large circle, and a small solid circle, followed by a gap, then three more shapes: a small triangle, a large triangle, and a small solid triangle, and finally a question mark followed by a square. The bottom row shows four pairs of shapes labeled (a), (b), (c), and (d).

(1) (a)

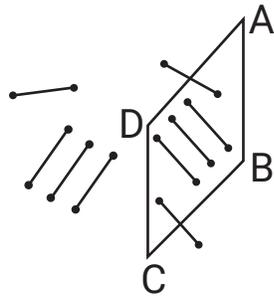
(2) (b)

(3) (c)

(4) (d)

Question-5

In the given figure, ABCD is the mirror.



How many line segments are actually there?

- (1) 10 (2) 11
 (3) 7 (4) 6

Question-6

What should be in place of (?)

$$\begin{array}{l}
 \text{Jar 1} \times \text{Jar 2} + \text{Jar 3} = 40 \\
 \text{Jar 4} + \text{Jar 5} \div \text{Jar 6} = 10 \\
 \text{Jar 7} \times \text{Jar 8} \div \text{Jar 9} + \text{Jar 10} = 2.5 \\
 \text{Jar 11} \times \text{Jar 12} \div \text{Jar 13} + \text{Jar 14} = ?
 \end{array}$$

(Consider complete shaded jar as full filled while half shaded jar as half filled and each colour shows distinct value for different jars)

- (1) 4 (2) 2
 (3) 3 (4) 10



Answers (Puzzles)

Solution-1

Ans. (3)

●  = 8

● $2 \times \text{car} - 8 + 8 = 8 + \text{car} - 5$  = 8

$\Rightarrow \text{car} = 3$

● $\text{bus} + 3 - 8 + 3 = 0$  = 8,  = 3

$\Rightarrow \text{bus} = 2$

● $8 \div 2 \times 3 + 2 \div \text{orange} = 12.5$  = 8,  = 3,  = 2

$\Rightarrow 12 + 2 \div \text{orange} = 12.5$

$\Rightarrow \text{orange} = 4$

So, $8 + 3 + 4 + 2 = 17$

Solution-2

Ans. (2)

$$3 \times 1 + 1 = 4$$

$$4 \times 2 + 2 = 10$$

$$10 \times 3 + 3 = 33$$

$$33 \times 4 + 4 = 136$$

$$136 \times 5 + 5 = 685$$

$$685 \times 6 + 6 = 4116$$

$$4116 \times 7 + 7 = 28819$$

Solution-3

Ans. (1)

3	2	1	0	1	2	3	2	1
2	1	0	1	2	3	2	1	0



Solution-4

Ans. (2)

Smaller Figure

Large Figure

Shaded Smaller Figure

Solution-5

Ans. (4)

Sticks which are the reflection in the mirror would not be counted.

Solution-6

Ans. (2)

From 1st equation

$$\text{Red cup} = 8$$

From 2nd equation

$$\text{Pink cup} = 2$$

From 3rd equation

$$\text{Blue cup} = 4$$

$$\text{So, } 2 \times 4 \div 8 + 1 = 2$$

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Happy Birthday

Ronald Ross

“Science is the Differential Calculus of the mind. Art the Integral Calculus; they may be beautiful when apart, but are greatest only when combined.”



Born - 13 May 1857
Died - 16 Sep 1932

Ronald Ross was born on May 13, 1857, in Almora, India. At the age of 14, Ross won a prize in mathematics and was presented the book *Orbs of Heaven*, which sparked his interest in the field of mathematics. Ross is known for his outstanding research work on malaria-causing parasites in mosquitoes. He discovered malarial parasites in the salivary glands of mosquitoes.

Nobel Prize in Physiology or Medicine (1902), The James Tait black Memorial Prize - Biography (1923).

OUR RESULTS 2024

AIR

NEET (UG) 2024

JEE (Advanced) 2024

State Topper Delhi
State Topper Uttar Pradesh
State Topper West Bengal
State Topper Uttar Pradesh
State Topper Maharashtra
State Topper Rajasthan

Mridul M Anand 3 Year Classroom
Ayush Naugraiya 4 Year Classroom
Arghyadeep Dutta 2 Year Classroom
Aryan Yadav 1 Year Classroom
Palansha Agarwal 2 Year Classroom
Iram Quazi 1 Year Classroom

AIR 25
AIR 67
AIR 78
AIR 93
AIR 95

Rishi Shekher Shukla 2 Year Classroom
Krishna Sai Shishir 4 Year Classroom
Abhishek Jain 4 Year Classroom
Hardik Aggarwal 2 Year Classroom
Ujjwal Singh 4 Year Classroom

1430 Students Scored Above MAS

344

Classroom Students
Qualified in
NSEs* 2023-24

(Group A & B)
34+30
NSEA*

156
NSEB*

72
NSEC*

23
NSEP*

29
NSEJS*

Aakashians Qualified for INO-2024



Diptanshu Sharma
NSEB | NSEC | NSEP



Priyanshu Sarkar
NSEB | NSEC | NSEP



Mridul Garg
NSEB | NSEC | NSEP



Zaman Hussain
NSEA | NSEC | NSEP



Shubhradeep Paul
NSEA | NSEC | NSEP



Samvit Shandilya
NSEA | NSEC | NSEP

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 OCSC/IMOTC-2024

32

Classroom Students
Qualified
in INOs 2024



Aneesh Shastri
Qualified INAO



Sanvi Jain
Qualified INChO



Mridul M Anand
Qualified INBO



Zaman Hussain
Qualified INMO



Sushant Agarwal
Qualified INJSO



Archit Kumar
Qualified INAO Jr

OCSCs - Orientation cum Selection Camps | IMOTC - International Mathematical Olympiad Training Camp

and many more...

Aakashians Qualified for RMO from Classroom Programs

899

Classroom Students
Qualified
in IOQM 2024



Class VIII
Joish Achyuta
2 Year Classroom



Class VIII
Pranava NS
3 Year Classroom



Class VIII
Bruteshwar Rajguru
3 Year Classroom



Class VIII
Hardik Mishra
2 Year Classroom



Class VIII
Hardik Dhariwal
2 Year Classroom



Class IX
Dhanush Damu
4 Year Classroom

IOQM - Indian Olympiad Qualifier in Mathematics

and many more...

Board Exam Results 2024

Top Performers from Class X



Marks
500
500

Devidyuti K Pisharody
CBSE



Marks
499
500

P Harini
CBSE



Marks
498
500

Jiya Dugar V
CBSE

and many more...

Top Performers from Class XII



Marks
496
500

Ananthan R
CBSE



Marks
495
500

Ansh Agrawal
CBSE



Marks
495
500

Himanshu Agarwal
CBSE

and many more...



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