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Reasoning
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We can find challenges in every sphere of our lives. Be it finding the best route to a cinema hall on traffic packed roads or choosing the right item in a supermarket.

How best are we equipped to deal with challenges is the question?

Reasoning Ability is a systematic process of thinking where a problem or plan is analysed from various angles in its most practical sense. Hence yields better decisions and better conclusions.

That's why every student's **Reasoning Ability** is tested in almost every competitive exam today.

The process of learning is dependent on one's ability to think logically and reason quickly and effectively. These two factors are hence very crucial to a child's progress in education.

This critically important ability of reasoning should be seeded and nurtured in the minds of the students in their budding stage itself. Once the seed of reasoning sprouts in the young minds, the way they see the world entirely changes. Life itself looks like an exciting puzzle to be solved.

Reasoning and logic skills are an integral part of a wide range of subjects such as **Math, Science, Design and Technology**, etc. These skills are also vital in our day to day lives.

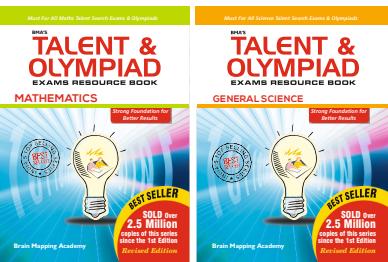
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Solution	Solutions book included									

This book is very useful resource for various Cyber Olympiad Exams

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RQ™
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KNOWLEDGE REPUBLIC - 4

Class

4



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the best in you



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About Myself

My Photo

Name : _____

Date of birth : _____

Father's name : _____

Class : _____

School : _____

Address : _____

Home address : _____

Signature

*All those in the Knowledge Republic,
will have endless fun and resolve*

To enjoy as much as one can.

To work hard yet keep it fun.

To respect and encourage each individual's ability and creativity.

To eat, sleep and breathe in the world of knowledge.

To uphold values, basic honesty and integrity.

To pursue ever-higher goals.

By Order of
President
Knowledge Republic



M			
E			
M			
O	R	Y	
			techniques

The art of memorisation is referred to as **mnemonics**. Its basic principle is to use the best functions of the human brain to code information.

A very simple example of mnemonics is the '**30 days hath September**' rhyme to remember days in each month.

*30 days hath September,
April, June and November,
All the rest have 31,
Except February alone
(And that has 28 days clear,
With 29 in each leap year).*

Remember the key points

Positive, pleasant, vivid, colourful images are easier to remember.

Jot down every diagram, map or symbol written on the board by the instructor.

Rewrite and organise notes

Create index cards on key terms or definitions and review and recite frequently. **Acronyms**, **Acrostics** and **Association** are three such memory techniques.

Acronyms

An acronym is made up of letters from a series of words, e.g. :

1. Basic needs of humans : **WAS-F** — Water, Air, Shelter, Food
2. **SCREAM-N** helps science students to remember the **organ systems**. Skeletal, Circulatory, Respiratory & Reproductive, Alimentary canal (Digestive), Muscular, Nervous System.
3. **TEENS** stand for **sense organs**. Tongue, Eyes, Ears, Nose, Skin.



4. Characteristics of living things : **RENGRIM** — Respiration, Excretion, Nutrition, Growth, Reproduction, Irritability, Movement.

Acrostics

Acrostics is a memorising technique wherein you create a meaningful sentence by using the first letter of each word.

Example :

1. Water Cycle : Evaporation, Condensation, Rain, Snow.
'Eleven Camels Raced on Sand'.

Association

Association is yet another memory technique, in which key terms can be associated to our experiences, thus facilitating, understanding and remembering.

1. **Lungs** can be associated with **balloons** because balloons expand when air is blown into them. Lungs also expand when we breathe in air.
2. **Heart** can be associated with **water pump**. **Arteries** and **veins** can be associated with **pipelines**. Heart pumps blood through blood vessels same as the waterpump pumps water through pipelines to outlets all over the house.
3. Hinge joint can be associated with that of a 'Door'. Bending forearm towards the upperarm functions as a hinge of door.
4. Functions of brain can be associated with the working of a computer. It receives, stores and recalls information as and when necessary.
5. Functioning of oesophagus and intestine can be associated with that of a toothpaste tube.



**GUIDELINES FOR ANSWERING
MULTIPLE CHOICE QUESTIONS.**

Multiple choice test questions can be confusing. Here's a tool box of tricks and strategies to help you to become a master in answering multiple choice questions.

1. Read the instructions before you begin answering any questions.
2. Preview the test : It's a good idea to read through the test before you start with it. Thereby you get a feel of the information on the test and the amount of time you need to spend on any one part of the test.
3. When you read through the test, pick out questions that you find 'easy' i.e. you are sure of the answer. Answer those first.
4. Look for clues to the correct answer in the question asked.
5. Ignore the option that is unrelated to the question.
6. Look for a single pair of opposite answer options. The correct response is likely to be one of the two options in the pair, so ignore the other choices.
7. When you read the question, treat each option as a true or false question, and choose the option that is the 'most true'.
8. When you read the question, guess or predict the answer before looking at the given options.





SCRAMBLED QUESTION

Unscramble the given letters to make words that will be 'adjectives'. Some of the letters of those adjectives are marked beneath with symbols. Group those letters with respective symbols (in the boxes provided), then unscramble them to use as 'adjectives' to complete the sentence given at the end.

SAFT

EPCHA

TLEILT

IQEUT

BLBYBU

ENGRE

OURS

ODUL

--	--	--

The _____, _____ rainbow in the _____ sky.

Answer on page 20



Objectives

To help you

- enact the given tasks
- decide whether work has been done or not
- explain the above with reason



Materials required

- 12 visiting cards (one side blank)
- Sketch pens
- Chalk piece box (1)

What to do ?

Write one task on one card using a sketch pen, from the list of tasks given on the next page.

Put all the cards in a chalk piece box.

Ask your friend to draw a card from the box and perform the task (act) written on the card.

After enacting, discuss with your other friends whether work has been done or not. Give reasons for the conclusion.

Tabulate the responses like shown below.

Task	Force	What moved	Was work done ?
1	The push	Chair	Yes
2			
3			
4			



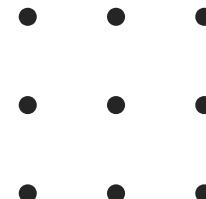
Common Misconceptions and Facts in Primary Science

? = X Misconceptions	? = ✓ F A C T S
Things that can move are living	Only living things move by themselves. Non-living things cannot move by themselves and need an external force to move them.
Food is digested in every part of the digestive system.	Food is digested only in the mouth, stomach and the small intestine.
The gases in air are present in fixed proportion.	The gases present in air are not in fixed proportions since air is a mixture.
Plants grow well in clayey soil.	Plants grow well in loam soil. Clay can hold a lot of water but very little air. Therefore plants do not grow well in clayey soil.
The Moon appears only at night.	The Moon is present in the sky all the time, even during the day. It is not visible during the day due to the brightness of the Sun.
Vitamins and minerals are sources of energy to the body.	Vitamins and minerals are chemical substances which the body requires in very small quantities and lack of them can cause illnesses.
All mammals give birth to young.	Low level mammals such as platypus and the spiny ant eater lay eggs.

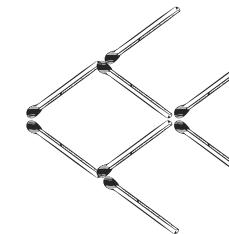


Puzzles

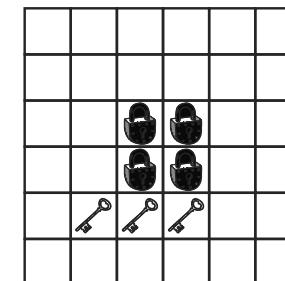
- 1) Nine dots arranged in a set of 3 rows. Your challenge is to draw four straight lines which go through the middle of all the dots without taking the pencil off the paper. Each line starts where the last line finishes.



- 2) Answer the following questions using the given diagram.



- i) Move 3 matches to turn the fish around.
 - ii) Move just 2 matches to turn the fish.
- 3) Slice the square into 4 identical sections, so that in each section there is 1 lock with its key. One key will not have a lock.





- 4) By moving 1 matchstick, make the number sentences correct.

a)

$$\begin{array}{c} \boxed{\square} \\ + \end{array} \longrightarrow \begin{array}{c} \boxed{\square} \\ = \end{array} \quad \begin{array}{c} \boxed{\square} \\ - \end{array}$$

b)

$$\begin{array}{c} \boxed{\square} \\ + \end{array} \longrightarrow \begin{array}{c} \boxed{\square} \\ = \end{array} \quad \begin{array}{c} \boxed{\square} \\ - \end{array}$$

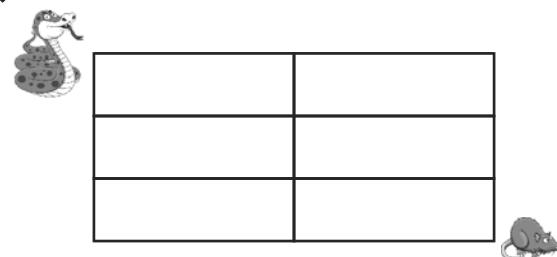
c)

$$\begin{array}{c} \boxed{\square} \\ + \end{array} \longrightarrow \begin{array}{c} \boxed{\square} \\ = \end{array} \quad \begin{array}{c} \boxed{\square} \\ - \end{array}$$

d)

$$\begin{array}{c} \boxed{\square} \\ + \end{array} \longrightarrow \begin{array}{c} \boxed{\square} \\ = \end{array} \quad \begin{array}{c} \boxed{\square} \\ - \end{array}$$

- 5) In how many ways can the snake reach its prey ? (only → and ↓ movements are allowed).



Answers on page 20



To find out

How air gets contracted on cooling

You will need :



- ☞ A balloon
- ☞ A glass Jar
- ☞ A bowl of ice cubes

What do you do ?

1. Inflate the balloon and tie its mouth with a string. The inflated balloon should be a little bit larger than the mouth of the glass jar.
2. Try to push the balloon into the jar. Impossible ?



3. Keep the balloon in the bowl of ice cubes for some time.
4. Now try to push the balloon into the jar.



What do you find ?

This time the balloon goes in easily.

What do you conclude ?

The air inside the balloon has contracted on cooling. That is why the balloon goes in the jar easily.



PLANET SEARCH

Locate the eight planets of our solar system in this letter grid and list them in an order. You can trace them vertically, horizontally or diagonally. One example is shown. Time allowed to complete this activity is 10 minutes.

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

1. _____

2. VENUS

3. _____

4. _____

5. _____

6. _____

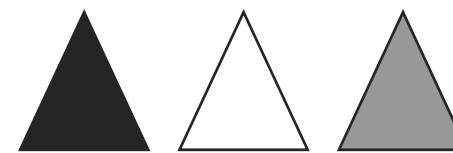
7. _____

8. _____

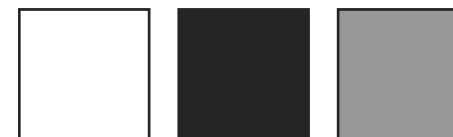


Brain Teasers

- 1) **NOTE:** The first number in each row tells the number of figures from that row, that will appear in the solution. The second number tells how many of the figures in the row are in the same position in the solution as they are in the row. Solution will have one triangle, one square and one circle.



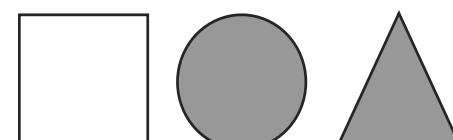
1 - 1



1 - 1



1 - 1



2 - 1

Solution:

Answer on page 21



Famous Scientist Facts

The world we live in today would no doubt be a different place if it weren't for the amazing discoveries produced by this list of famous scientists. Their ideas, research, experiments, publications and determination are an inspiration to those that follow in their footsteps. Covering a broad range of scientific fields such as biology, physics, astronomy and chemistry, these men and women have pushed the world of science forward, allowing the human race to another seemingly impossible questions while at the same time opening the door to new fields of research and discovery. Some scientists and their contributions are mentioned below.

- **Albert Einstein** changed the world of science with his brilliant work in theoretical physics. His theories, equations and ideas became the stuff of legend and his image is known around the world.
- Italian Scientists **Galileo** developed telescopes and used them to make revolutionary observations about our solar system discovering new objects like the moons that orbit jupiter.
- **Johannes Kepler** was a famous German astronomer and mathematician who made a number of scientific breakthroughs including his three laws of planetary motion.
- Often referred to as the father of nuclear physics, New Zealand born chemist **Ernest Rutherford** won a Nobel Prize in chemistry, developed a new model of the atom and mentored other scientists.

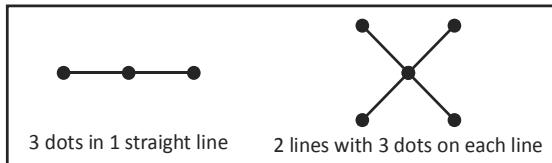


- What British physicist and chemist **Michael Faraday** lacked in formal education he more than made up for with brilliant experimental techniques and revolutionary electromagnetism ideas.
- **Isaac Newton** developed the theory of universal gravitation as well as his famous three laws of motion, forever leaving his mark on physics, astronomy and mathematics.
- **Charles Darwin** introduced the ideas of natural selection to the world, backing up his theories on evolution with substantial observational data recorded on his long sea voyages.
- French chemist and microbiologist **Louis Pasteur** created a new level of understanding regarding microorganisms, the causes of disease and disease prevention.
- **Jane Goodall** is known for her study of the behavior of chimpanzees in social situations as well as being a tireless animal rights advocate and humanitarian.
- **Edwin Hubble** was a major contributor in the field of astrophysics, helping open our eyes to the idea of other galaxies. He was honored by NASA who named the Hubble Space Telescope after him.
- The husband and wife combination of **Pierre & Marie Curie** contributed much to science through both their own individual work and their combined research efforts in the field of radioactivity.
- British theoretical physicist **Stephen Hawking** is famous for his work on black holes. He also wrote books such as 'A Brief History of Time', enabling a wide audience to appreciate his ideas.



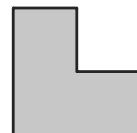
Creative Thinking

- 1) Given three bowls: 8, 5 and 3 litres capacity, divide 8 liters in half ($4 + 4$ litres) with the minimum number of water transfers. Note that the 8-litre bowl is initially filled with 8 litres of water and the other two bowls are empty - that is all water you have.
- 2) Observe the two figures.



Now draw 3 straight lines with 3 dots on each line, using the fewest dots possible.

- 3) Box A has 8 more oranges than box B. How many oranges should be moved from box A to box B so that box B has 2 more oranges than box A ?
- 4) Divide the figure below into 4 equal parts.



- 5) Fill in the grey boxes with '+', '−', '×', or '÷' to complete the number sentences.

a) $1 \boxed{\quad} 1 \boxed{\quad} 1 = 1$

b) $4 \boxed{\quad} 4 \boxed{\quad} 4 \boxed{\quad} 4 = 68$

Answers on page 21



THE 100 BASIC WORDS

Tony Buzan, in his book 'Using your Memory', points out that just 100 words comprise 50% of all words used in conversation in a language. Learning those core 100 words gets you a long way in speaking that language, at a basic level.

The 100 basic words used in English conversation are given below. These typically comprise around 50% of all words used.

- | | | | |
|---------------|--------------|---------------|---------------|
| 1. a, an | 2. after | 3. again | 4. all |
| 5. almost | 6. also | 7. always | 8. and |
| 9. because | 10. before | 11. big | 12. but |
| 13. (I) can | 14. (I) come | 15. either/or | 16. (I) find |
| 17. first | 18. for | 19. friend | 20. from |
| 21. (I) go | 22. good | 23. goodbye | 24. happy |
| 25. (I) have | 26. he | 27. hello | 28. here |
| 29. how | 30. I | 31. (I) am | 32. if |
| 33. in | 34. (I) know | 35. last | 36. (I) like |
| 37. little | 38. (I) love | 39. (I) make | 40. many |
| 41. one | 42. more | 43. most | 44. much |
| 45. my | 46. new | 47. no | 48. not |
| 49. now | 50. of | 51. often | 52. on |
| 53. one | 54. only | 55. or | 56. other |
| 57. our | 58. out | 59. over | 60. people |
| 61. place | 62. please | 63. same | 64. (I) see |
| 65. she | 66. so | 67. some | 68. sometimes |
| 69. still | 70. such | 71. (I) tell | 72. thank you |
| 73. that | 74. the | 75. their | 76. them |
| 77. then | 78. there is | 79. they | 80. thing |
| 81. (I) think | 82. this | 83. time | 84. to |
| 85. under | 86. up | 87. us | 88. (I) use |
| 89. very | 90. we | 91. what | 92. when |
| 93. where | 94. which | 95. who | 96. why |
| 97. with | 98. yes | 99. you | 100. your |

From : 'Use Your Memory' by Tony Buzan, BBC Books, London, ISBN 0-5633-37102-1



Vocabulary

- I. Fill in the blanks with the correct letters to find out what the young of more animals and insects are known as.
- The elephant walked slowly so that her c _____ could catch up.
 - The shark and her c _____ were caught but the anglers freed them.
 - Did you see the hen and her c _____s wandering around the backyard?
 - The h _____ i _____ s of the turtles made their way towards the sea.
 - Phyllis watched in fascination as the c _____ t _____ p _____ metamorphosed into a moth in the jar.
 - The lost l _____ bleated for its mother sheep pitifully.
 - The zebra nudged her f _____ gently to encourage it to walk on its own.
 - The vixen and her litter of p _____ rested comfortably in their den.
 - The penguin fed her c _____ i _____ with regurgitated food.
 - The she-bear growled in anguish when she discovered that her c _____ s were missing.
 - The rabbit stayed in a corner of her hutch while her k _____ hopped around actively.



- II. Find words in the grid. Write them under their final blends.

e	x	c	e	p	t	a
b	t	h	u	m	p	t
r	f	a	c	t	h	t
a	l	i	m	p	e	r
n	w	i	n	d	l	a
d	w	e	p	t	p	c
y	e	l	p	x	x	t
i	n	s	u	l	t	x
r	e	s	u	l	t	x

It Ip mp nd ct pt

_____ _____ _____ _____ _____ _____

- III. Study these cramped words carefully. Underline those that contain the **use** pattern and circle those that contain the **ute** pattern.

salute excuse refuse brute abuse dispute parachute
museumumamusecutemuteflutefusebecauseaccusecompute

Who am I ?

- I will come one time in a minute, two times in a moment, but will never come in thousand years.
- I am the most slippery country in the world.

Answers on page 21



IV. Let's see how well you know the words that express human relationships. Fill the blanks below as required

What is your....

- 1) father's mother to you ? _____
- 2) mother's mother to you ? _____
- 3) father's brother to you ? _____
- 4) brother's daughter to you ? _____
- 5) father's wife to you ? _____
- 6) uncle's wife to you ? _____
- 7) father to your mother ? _____
- 8) father-in-law's daughter to you ? _____
- 9) mother's husband to you ? _____
- 10) brother's son to you ? _____
- 11) sister's husband to you ? _____
- 12) sister or brother to you ? _____
- 13) uncle's child to you ? _____
- 14) mother to your father ? _____
- 15) wife's father to you ? _____

Who am I ?

- What is the word that is spelled incorrectly in all dictionaries ?
- Everyone in the world break me when they speak every time.

Answers on page 21



Answers

SCRAMBLED QUESTION

- 1) FAST, CHEAP, LITTLE, QUIET, BUBBLY, GREEN, SOUR, LOUD

★ THIBGR, ♣ EBUL, ♦ FCLULROOU

The BRIGHT, BLUE rainbow in the COLOURFUL sky.

Puzzles

- 1)
- 2) i)
- ii)
- 3)
- 4)
- 5)

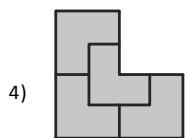
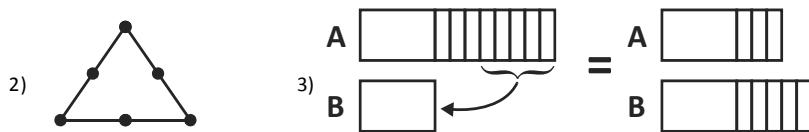


Brain Teasers



Creative Thinking

- 1) Pour 5 litres from the 8-litre to the 5-litre bowl,
- Pour 3 litres from the 5-litre to the 3-litre bowl,
- Pour these 3 litres back to the 8-litre bowl,
- Pour the remaining 2 litres from the 5-litre to the 3-litre bowl,
- Pour 5 litres from the 8-litre to the 5-litre bowl,
- Pour the missing 1 litre from the 5-litre to the 3-litre bowl (there should be 4 litres left in the 5-litre bowl),
- Pour the 3 litres back from the 3-litre to the 8-litre bowl (and that's it in 8-litre bowl 4 litres).



5) (a) $1 + 1 - 1 = 1$ (b) $4 \times 4 \times 4 + 4 = 68$

Vocabulary

- I. Calf, cub, chicks, hatchlings, caterpillar, lamb, foal, pups, chick, cubs, kits
- II. insult, result; help, yelp; limp, hump; brand, wind; tract, fact; wept, except

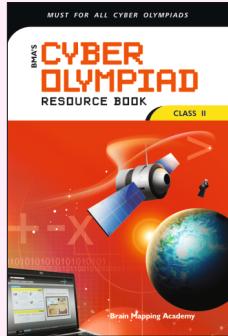
III.

salute	excuse	refuse	brute	abuse	dispute	parachute		
museum	mause	cute	mutef	utef	use	because	accuse	compute

- IV.

1) Grandmother	2) Grandfather	3) Uncle	4) Niece
5) Mother	6) Aunt	7) Husband	8) Wife
9) Father	10) Nephew	11) Brother-in-law	12) Sibling
13) Cousin	14) Wife	15) Father-in-law	

Who am I? • M • Greece • Incorrectly • Silence



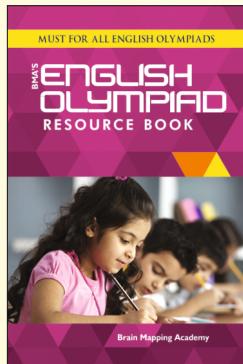
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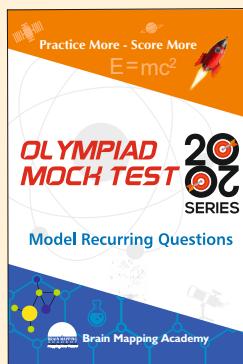
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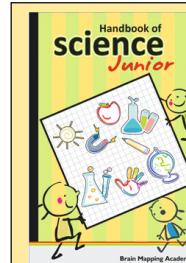
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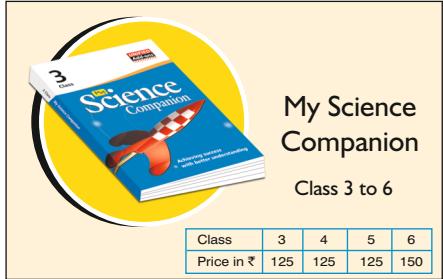
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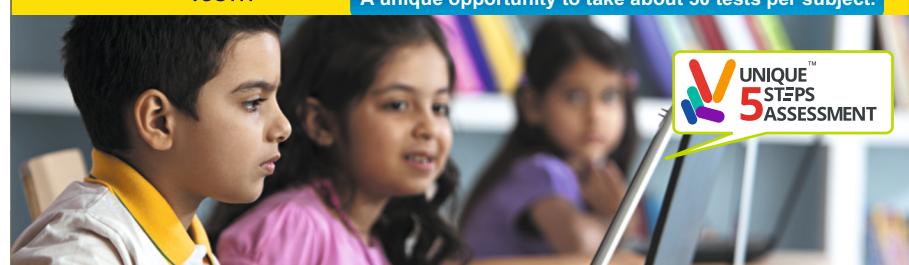
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