



THE TIMES OF INDIA

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TODAY'S EDITION

➤ An educator talks of the challenges and fears students generally face while attempting maths and how teachers can help them overcome it
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➤ Business magnate Ratan Tata, who recently turned 84, is an inspiration for all. A youngster narrates how his mantra to strive hard keeps him going
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➤ England hope to salvage pride as they gear up for next Ashes Test
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STUDENT EDITION

TUESDAY, JANUARY 4, 2022



The year 2022 is all set to be a defining year for India on many fronts – technology, space, sports, etc. In politics, the Assembly elections in five states and the Presidential polls, will test Modi's popularity yet again...

CLICK HERE: PAGE 1 AND 2



Teens get jabbed!

The vaccination for children aged between 15 and 18 years in India began amid a surge in Covid-19 infections on Monday. Two doses of the Covaxin are to be administered at an interval of 28 days...

- 1 The Centre has recommended separate vaccination centres, session sites, queues as well as separate health staff for the campaign to avoid any inadvertent mixing of vaccines
- 2 Over 16 lakh teens have been vaccinated so far on the first day of vaccination, as per the government's CoWin portal
- 3 An estimated 74 million children in the 15-18 years age group are eligible for the vaccination, according to health ministry's estimates. The vaccination process of third precautionary dose of vaccine for health workers, frontline workers and vulnerable senior citizens will begin from January 10



Quote unquote

Women are a major reason behind the evolution of Hindi cinema. We have seen an absolute evolution in the way we tell stories on the screen, and it warms my heart that women have been a constant part of this process. I have grown up admiring our cinema but one thing that I have personally noticed is how women have shaped the growth trajectory. They have been an integral part of not just cinema but the overall growth of the nation
Shraddha Kapoor, actor

Vaccine, vaccination trended most on social media in 2021

Vaccine and vaccination have topped the list of the most-popular words used on social media this year, media reports said. According to the Medialogia information and analytical system, vaccine or vaccination were used 63.72 million times in 2021, TASS news agency reported. This was followed by bitcoin or cryptocurrency with 19.59 million references, while the word pandemic was ranked third, having been used 19.58 million times.

The top 10 list also includes the words dose (used 17.14 million times), immunity (13.58 million), Sputnik (13.55 million), QR code (12.05 million), quarantine (11.07 million), migrant (9.44 million), and Olympics (6.14 million), the report said.



INDIA'S CALENDAR: 12 MONTHS OF ACTION



UTTAR PRADESH POLLS

1 Prime Minister Narendra Modi and UP Chief Minister Yogi Adityanath have made a slew of announcements to stop the slide in electoral fortunes in the crucial electoral state of UP, which goes to the polls soon. The BJP's projected tally in the ensuing elections is now holding steady at 210 seats.



THE RISE OF KEJRIWAL

2 Delhi Chief Minister Arvind Kejriwal has a spring in his step, as he steps out of his comfort zone in Delhi to grab power in Punjab and Goa. The BJP is worried about his dominant presence, as he uses copycat themes to enlarge the scope of his politics, the latest being the appropriation of BR Ambedkar after Lord Ram.



CHINA'S TERRITORIAL CLAIMS GETS SHRILLER

3 India's challenge in 2022 is to not only ensure Chinese troops return to status quo as on April 2020 when the aggression at the LAC began, but also to keep the balance in the neighbourhood, where China is making deeper inroads. At the same time, Moscow appears keen to arrange a trilateral summit with PM Modi and President Xi Jinping of China, the two leaders who haven't spoken directly since the standoff began.

5G ROLLOUT

4 The department of technology has announced that 5G internet services will be rolled out in India in 2022. A total of 13 cities across the country will get the technology in the beginning.



SPORTING BATTLES

5 While the calendar is packed with marquee events, the big question is will Covid allow the Asian Games, Commonwealth Games, Soccer World Cup in Qatar, ICC T20 World Cup in Australia to take place?

THE PRESIDENT AND VP ELECTIONS

6 Will PM Modi pull the rabbit out of the bag and appoint Sharad Pawar to neutralise NCP politically and retain Maharashtra or alternatively make a political statement by making a minority Prez or VP?

INDEX OF OPPOSITION UNITY

7 It will be truly tested in the President's election in July. West Bengal, Tamil Nadu and Kerala polls have shown in 2021 that the Opposition chieftains can keep the BJP at bay, if the entire Opposition spectrum joins hands in the electoral college. The Maharashtra model can be used effectively. As of 2021, the electoral college comprises 776 MPs and 4,120 MLAs.



CONQUERING THE FINAL FRONTIER

8 India will launch two unmanned missions in 2022 before the human spaceflight programme 'Gaganyaan' by the end of the year. The Venus mission is planned for 2022 as well.



SAFFRON FADING?

9 It will be a true test for PM Modi in 2022 as the prospect of a shrunk lotus emerges. From UP to Goa, from Uttarakhand to Manipur, and from Gujarat to Himachal – the fight to save these forts gets tougher. However, knowing the PM's political sagacity and strategies, he will surely leave everyone surprised, feel political pundits.



UP, GUJARAT: 2 STATES

10 The two contests are likely to be very different. Gujarat has had a BJP government since 1998, which makes it the longest running government for a political party in the country at the moment. Meanwhile, Yogi will become the first BJP CM in UP to survive a full term. Both these contests are a litmus test for Modi.



MSP: PLATE TO PLOUGH

11 After the climbdown on three farm laws, will Modi and BJP give in to the demand for Minimum Support Price (MSP)? The electoral battle in Punjab and UP will determine the future of the farmer pot which remains on the boil.

PANDEMIC POLITICS

12 Covid is the big unknown of the year. The third wave has set in already in the beginning of the year, for the first time in the Indian winter. The Union Budget and Assembly elections in five states will have to contend with this factor.

Daniel Craig receives same British honour as his fictional counterpart James Bond



Actor Daniel Craig, who is known for playing the British spy James Bond in films, has recently received the same title as his fictional counterpart in the UK's annual New Year Honours List. According to Deadline, Craig has been made a Companion of the Order of St Michael and St George (CMG), for his contribution to film, including portraying Bond five times. The same honour has been bestowed upon author Ian Fleming's 007 fictional character in his books.

Along with him Barbara Broccoli and Michael Wilson, the producer/caretakers of the James Bond movie franchise, were also honoured

New Year's asteroid larger than Big Ben will shoot past Earth - and four more will follow it



An asteroid larger than Big Ben is going to scorch past the Earth this month. The space rock, dubbed Asteroid 2013 YD48 by NASA, is 104 metres tall and will pass within 5.6 million kilometres of Earth on January 11.

OBSERVE, QUESTION AND SEEK ANSWERS IN SCIENCE



CLASS: X - 2021-22

SUBJECT:
SCIENCE (CBSE)

Maximum Marks: 40

Time Allowed: 1½ Hours

PAPER SET BY INDU PUNJABI, UDGAM SCHOOL FOR CHILDREN, AHMEDABAD

GENERAL INSTRUCTIONS

- i. All questions are compulsory.
- ii. There is no overall choice.
- iii. Read the question paper thoroughly before attempting it.
- iv. The question paper consists of 40 objective type questions and three sections.
- v. Section A- Question no. 1-14 are multiple choice questions and carry one mark each. Answer them as instructed.
- vi. Section B- Question no. 15 -28 are Assertion- Reason type and multiple-choice questions and carry one mark each.
- vii. Section C- Question no 29 -40 are to be answered after reading the paragraphs given. Each question is of one mark.

PART-A

Choose the correct options for the following:

- Q1. When coal burns in air it is an:
(a) Endothermic reaction
(b) Oxidation reaction
(c) Exothermic reaction
(d) both (b) and (c)
- Q2. In a double displacement reaction such as the reaction between sodium sulphate solution and barium chloride solution:
i. Exchange of atoms takes place
ii. Exchange of ions takes place
iii. Precipitate is produced.
iv. A soluble salt is produced.
The correct option is:
(a) (ii) & (iv)
(b) (ii) & (iii)
(c) Only (ii)
(d) Only (iii)
- Q3. Classify each of the following reactions:
1) $Zn + 2AgNO_3 \rightarrow Zn(NO_3)_2 + 2Ag$
2) $Ca(OH)_2 \xrightarrow{\text{Heat}} CaO + H_2O$
3) $Pb(NO_3)_2 + 2KI \rightarrow KNO_3 + PbI_2$
4) $2H_2S + SO_2 \rightarrow 3S + 2H_2O$
(a) 1. Displacement 2. Neutralization
3. Decomposition 4. Redox reaction
(b) 1. Redox reaction 2. Decomposition
3. Combination 4. Double Displacement
(c) 1. Displacement 2. Decomposition
3. Double Displacement
4. Redox reaction
(d) 1. Decomposition 2. Redox reaction
3. Double Displacement 4. Displacement
- Q4. Baking powder is a mixture of A and a mild edible acid such as B; when it is heated, C is produced which makes bread and cake soft and spongy. A, B and C are respectively
(a) Sodium carbonate, acetic acid, CO_2
(b) Sodium hydrogen carbonate, tartaric acid, and CO_2
(c) Sodium hydroxide, acetic acid, H_2
(d) Sodium chloride, oxalic acid, H_2
- Q5. When three unknown colorless solutions P, Q, and R are dropped on pH paper one by one they change to blue, violet, and orange colours respectively. The decreasing order of the pH values of these solutions are:
(a) $Q > R > P$
(b) $R > Q > P$
(c) $Q > P > R$
(d) $P > Q > R$
- Q6. Identify the correct statements about photosynthesis.
i. Mesophyll cells in leaf are the principal center of photosynthesis.

- ii. Splitting of water molecules into hydrogen and oxygen ions in the presence of light is called polymerization.
iii. Conversion of glucose into starch is called photolysis.
iv. Reduction of carbon dioxide into carbohydrates is the last event in the process of photosynthesis.
(a) (i) and (iv) (b) (i) and (iii)
(c) (ii) and (iii) (d) (iii) and (iv)

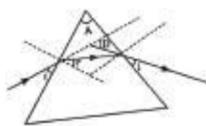
Q7. Which blood vessel does not carry any CO_2 ?
(a) Vena cava (b) Hepatic vein
(c) Pulmonary vein
(d) Pulmonary aorta

Q8. Glomerular filtrate does not contain:
(a) Protein (b) Glucose
(c) Salts (d) Water

Q9. A needle placed 45 cm from a lens forms an image on a screen placed 90 cm on the other side of lens, focal length and type of lens is:
(a) 10 cm, convex lens
(b) 30 cm, convex lens
(c) 30 cm, concave lens
(d) 10cm, concave lens

Q10. A student performs an experiment on tracing the path of a ray of light passing through a rectangular glass slab for different angles of incidence. He measures the angle of incidence $\angle i$ angle of refraction $\angle r$ and angle of emergence $\angle e$ all his observations. He would find that in all cases:
(a) $\angle i$ is more than $\angle r$ but nearly equal to $\angle e$.
(b) $\angle i$ is less than $\angle r$ but nearly equal to $\angle e$.
(c) $\angle i$ is more than $\angle e$ but nearly equal to $\angle r$.
(d) $\angle i$ is less than $\angle r$ but nearly equal to $\angle e$.

Q11. In the following ray diagram, the correctly marked angles are:



(a) $\angle i$ and $\angle r$ (b) $\angle i$ and $\angle r$ and $\angle D$
(c) $\angle A$ and $\angle D$ (d) $\angle r$, and $\angle A$ and $\angle D$

Q12. The danger signals installed at the top of tall buildings are red in color. These can be easily seen from a distance because among all other colours, the red light:
(a) Is scattered the most by smoke or fog.
(b) Is scattered the least by smoke or fog.
(c) Is absorbed the most by smoke or fog
(d) Moves faster in air.

Q13. Twinkling of stars is seen due to the:
(a) Regular emission of light from the stars
(b) Weather changes
(c) Stars are far away
(d) Refractive index of air in the given region goes on changing randomly.

Q14. Which of the following colour of light undergoes the maximum deviation while passing through a glass prism?
(a) Violet (b) Red
(c) Green (d) Blue

PART-B

Question No. 15 to 18 consist of two statements - Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:
(a) Both A and R are true, and R is the correct explanation of A
(b) Both A and R are true, and R is not the correct explanation of A
(c) A is true but R is false
(d) A is false but R is true

Q15. A: Some metal oxides, such as aluminium oxide, zinc oxide shows both acidic as well as basic behavior.
R: Acidic or basic behavior depends upon the temperature of the oxide.

Q16. A: Walls of ventricles are thicker than the auricles.
R: This helps in preventing the backflow of the blood.

Q17. A: Concave mirrors are used to concentrate sunlight to produce heat in solar cookers.
R: Concave mirrors converge the light falling on it to a point.

Q18. A: Tyndall effect is an optical phenomenon of light used to explain atmospheric refraction.
R: The tiny particles of dust disperse the sunlight falling on it through foliage in a forest.

Q19. Solid calcium oxide reacts vigorously with water to form calcium hydroxide accompanied by heat. This process is called slaking of lime. Calcium hydroxide dissolves in water to form lime water. Which among the following is/are true about slaking of lime and the solution formed?
i. It is an endothermic reaction.
ii. It is an exothermic reaction.
iii. The pH of the resulting solution will be more than seven.
iv. The pH of the resulting solution will be less than seven.
(a) i and ii (b) ii and iii
(c) i and iv (d) iii and iv

Q20. Sodium carbonate is a basic salt because it is a salt of:
(a) Strong acid and weak base
(b) Weak acid and weak base
(c) Strong acid and strong base
(d) Weak acid and strong base

Q21. $Zn + H_2O$ (Steam) \rightarrow A + B, In the equation A and B are:
(a) Zn, H only (b) ZnH_2 and O_2
(c) ZnO_2 and O_2 (d) ZnO and H_2

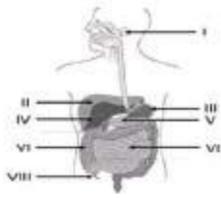
Q22. Which of the following metals can displace hydrogen from acids?
(a) Silver (b) Mercury
(c) Magnesium (d) Copper

Q23. Aluminium is used for making cooking utensils. Which of the following properties of aluminium are responsible for the same?
i. Good thermal conductivity
ii. Good electrical conductivity
iii. Ductility
iv. High melting point
(a) i and ii (b) i and iii
(c) ii and iii (d) i and iv

Q24. Which of the following non-metal is lustrous?
(a) Sulphur (b) Oxygen
(c) Nitrogen (d) Iodine

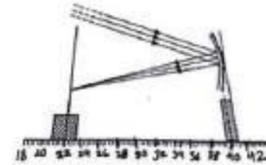
Q25. What type of nutrition is carried out by Amoeba and Paramecium?
(a) Holozoic (b) Pinocytosis
(c) Absorptive (d) Saprophytic

Q26. The diagram shows the human gut. Which numbered structures secrete digestive enzymes?



(a) I, II, III, and IV (b) I, III, V, and VII
(c) I, II, III, IV, and V (d) II, III, VII and VI

Q27. The focal length of the concave mirror in the experimental set-up shown below is:



(a) 10.2 cm (b) 18 cm
(c) 11.4 cm (d) 12.2 cm

Q28. At noon the sun appears white as:
(a) Light is least scattered
(b) All the colours of white light are scattered away
(c) Blue color is scattered the most
(d) Red color is scattered the least

PART-C

Read the following paragraph and answer question no. 29-32

An acid reacts with a base to form corresponding salt and water. Some important corresponding salts are common salt, bleaching powder, baking soda, washing soda and Plaster of Paris. These salts are useful in our daily life. Common salt acts as a raw material for many compounds.

Q29. Sodium hydrogen carbonate solution was placed on a strip of pH paper. The color of the strip is:
(a) Blue
(b) Did not change
(c) Green and turned yellow
(d) Light pink

Q30. Match column I with column II and mark the correct option

I	II
1. $NaHCO_3$	i) Used for disinfecting water
2. Na_2CO_3	ii) Used for making toys
3. $CaOCl_2$	iii) Used for removing permanent hardness
4. $CaSO_4 \cdot \frac{1}{2}H_2O$	iv) Used in soda-acid fire extinguishers

(a) 1-iv, 2-iii, 3-i, 4-ii (b) 1-iii, 2-i, 3-iv, 4-ii
(c) 1-iii, 2-ii, 3-i, 4-iv (d) 4-i, 2-ii, 3-iv, 4-iii

Q31. A milkman added a small pinch of baking soda to fresh milk which had pH close to 6. As a result, pH of the solution becomes:
(a) Close to 2
(b) Close to 4
(c) Do not undergo any change
(d) Close to 8

Q32. Which gas is produced at the cathode during chlor-alkali process?
(a) H_2 (b) Cl_2
(c) O_2 (d) N_2

Read the following paragraph and answer the questions 33-36.

Naren was participating in a marathon. He was running at position two, right from the beginning. Just when he was near the finishing line, he started running even faster to stand first. And when he was about to win the marathon, he got a severe muscle cramp in his leg. This cramp prevented Naren from running any further and shattered his dream of winning the marathon.

Q33. The process which provides most of the energy to Naren for running the marathon is:
(a) anaerobic respiration

(b) aerobic respiration
(c) breathing
(d) fermentation

Q34. The substance which gets accumulated in the leg muscles of Naren that causes muscle cramp is:
(a) pyruvate
(b) ethanol
(c) carbon dioxide
(d) lactic acid

Q35. During respiration, exchange of gases takes place in:
(a) Trachea and larynx
(b) Alveoli of lungs
(c) Alveoli and throat
(d) Throat and throat

Q36. During the respiration of an organism X, one molecule of glucose produces 2 ATP molecules whereas in the respiration of another organism Y, one molecule of glucose produces 38 ATP molecules. Select the correct X and Y.

	X	Y
(a)	Cockroach	Fish
(b)	Yeast	Human Being
(c)	Green plant	Yeast
(d)	Yeast	Bacteria

Read the following paragraph and answer the questions 37-40.
The refraction of light on going from one medium to another takes place according to two laws which are known as laws of refraction of light. These laws are:
1. The incident ray, refracted ray and normal all lie in the same plane.
2. The ratio of sine of angle of incidence to the sine of angle of refraction is always constant for a given pair of media. This law is called Snell's law of refraction.

Q37. In which medium speed of light is minimum?
(a) Glass (b) Diamond
(c) Air (d) Water

Q38. If the refractive index of glass is 1.5 and speed of light is 3×10^8 m/s. The speed of light in glass is:
(a) 2×10^8 m/s
(b) 2.9×10^8 m/s
(c) 4.5×10^8 m/s
(d) 3×10^8 m/s

Q39. Observe the given table and consider two pairs of medium pair A (1 and 2) pair B(3 and 4) with the help of a table point out in which medium light speeds up as it moves in pair A and in pair B respectively.

Sr.No.	1	2	3	4
Medium	Water	Benzene	Turpentine	Alcohol
Rf	1.33	1.50	1.47	1.36

(a) Pair A (b) Pair B
(c) Both (d) None of the above

Q40. Refer the above table and find out refractive index of benzene with respect to water
(a) 1.12 (b) 1.25
(c) 1.02 (d) 1.13

These questions are meant for practice purpose only. Students are advised to check format, syllabus and marks for Board test papers with their teachers. Questions have been given by teachers and NIE is not responsible for them.

SOLVING THE FEAR OF NUMBERS

"Fear makes us human, overcoming it takes us closer to the person we dream of becoming."
-Anonymous

"I am good at all subjects except math!"

"Why are there so many numbers?"

"Do I have to remember all these formulas?"

"I wish we didn't have to learn math. Will I ever use this in the future?"

If you're a math teacher or professor, you've probably heard some version of these statements over the course of your career. My own son has said these to me and the irony is that I teach mathematics to 10th graders. Some children grasp the subject like free candy while others detest it like bitter cough syrup; usually, there are no in-betweens.

It goes without saying that math is the most feared subject among high school students and this fear often leads to a strong dislike and sense of hatred towards the subject. A good teacher already knows that not every child learns

at the same pace or in the same way. In this article, I explain why this particular subject is unique and some students excel while others carry it like a burden.

What makes mathematics unique?

Sometimes a class can be divided into students that like Math and those who don't and it is almost impossible to understand why this rift exists, but we can understand what this subject demands from learners.
• Unlike other subjects that require a

decent grasp on the English language, Mathematics demands a thorough understanding of numbers, language, and symbols. Simply put, students cannot just remember the English definition of a mathematical statement but need to interpret the impact of the signs used.

• Every problem is different from the last, sometimes just changing the numbers and asking a student the same question can leave them banging their heads for an answer.
• Many websites claim that math is abstract. This is a very vague statement since math can also be very naturalistic meaning many concepts can be explained using real-life examples.

• A student cannot proceed to learn advanced concepts without completely understanding the basics. Learning math is like constructing a building, as the number of floors increase, the stronger each other previous levels need to be.

What can teachers do to help students overcome their phobia?

As teachers, it is not our duty to simplify a concept, we must make it easier for a student to understand a concept for what it is. It is near impossible to cater to the individual learning styles of each student, but identifying the ones that are struggling and making them comfortable enough to ask you even the simplest of doubts will make you as a teacher and the subject more approachable. Math teachers have a tough task on their hands since many students begin with a mindset that it is difficult, breaking through this stereotype will help every student struggling to get a grip on the subject. Nonetheless, teachers have the creativity and teaching skills to help every student in the classroom overcome their fear of numbers.



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