



THE TIMES OF INDIA

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TODAY'S EDITION

Board exams are round the corner. Check your physics quotient with the physics sample paper, prepared by your teacher
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As we battle stress in this pandemic times, experts share quick tricks to kick-start your happy hormones
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IPL 2021: New-look RCB takes on defending champions MI in the opening match, amid Covid scare
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STUDENT EDITION

FRIDAY, APRIL 9, 2021



WEB EDITION

CLICK HERE: PAGE 1 AND 2

VIEWPOINT

IMA URGES PM MODI TO OPEN COVID VACCINATION FOR ALL ABOVE 18 YEARS

WANT OR NEED...

Amid a surge in Covid-19 cases in the country, the Indian Medical Association (IMA) has written to Prime Minister Narendra Modi suggesting that vaccination be allowed for all people above the age of 18 years

India reported the highest-ever 1,26,789 new Covid-19 cases in the last 24 hours, as per the Union health ministry data on Thursday. India has given more than nine crore doses of vaccine, and Thursday's tally stood at 9,01,98,673



- The IMA also suggested that private sector family clinics should be included actively in the vaccination drive, along with the private hospitals
- Making vaccination certificate mandatory for entering public places and receiving products under the public distribution system, was also part of the suggestions made by the association
- It said that the availability of vaccination with all doctors and family physicians will have a positive impact on the inoculation drive

STUDENTS' TAKE



As the supply of vaccine is limited, I feel precedence should be given to the priority groups, which include the senior citizens and those with co-morbidities. However, in Covid hotspots, where the positive cases are high, people above the age of 18, should be vaccinated to break the chain.
SAI KRISHNA PRIYA, class X, GTAVM, Chennai



Our country has a humongous working-population aged between 20 and 40. It's time they are inoculated, lest it takes a huge toll on the health of the masses, which in turn could effect our economy.
HARSH KUMAR AGARWAL, class X, National English School, Kolkata



With the cases of coronavirus on a deadly surge, I feel Covid vaccine should be made compulsory for everyone above the age of 18, as it's the young population, who are venturing out from their homes for different purpose.
ADITYA SINGH, class XII, Sadhu Vaswani International School, Pune

THE CHALLENGES & HOW TO TAKE IT FORWARD... EXPERTS SPEAK

Let's remember children's immune systems are different from the adults. So, their immune responses can vary at different ages— from infancy through the teenage years. The major challenge remains on getting a clarity on how safe it is to inoculate the young population
DR SANGITA KESKAR, head of pathology, Chinmaya Mission Hospital, Bengaluru

can be dealt with, if the govt takes up the programme first in areas, where the infection rate is high.
DR PRAVIN GARG, consulting physician, Ahmedabad

The database of youth above 18 years is still not in place. Also, with malls, pubs, cinemas, etc, open, it conveys a wrong message to the youngsters that Covid affects only the elders. They may not be ready to take the jab.
DR A SRIKANTH, secretary, Indian Dental Association, Hyderabad

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Spotlight

Mukesh Ambani first, Adani 2nd on Forbes 10 richest Indian billionaires 2021 list



With a net worth of \$84.5 billion, Mukesh Ambani, the chairman of Reliance Industries Ltd, has secured the first spot on the Forbes 10 richest Indian billionaires 2021 list. The Adani Group chairman Gautam Adani is at the second place (\$50.5 billion). An unprecedented surge in the wealth of the billionaires comes amid a rapid rise in the stock market, even as Covid-19 cases continue to rise across the country. According to Forbes, the number of billionaires increased to 140 from 102 last year, and their collective wealth doubled to \$596 billion last year.

HCL founder Shiv Nadar is perched on the third spot on the Forbes 10 richest billionaires 2021 list, with a net worth of \$23.5 billion

Avenue Supermarts' founder Radhakrishnan Damani at \$16.5 billion and Kotak Mahindra Bank's MD Uday Kotak with a fortune of \$15.9 billion took the fourth and the fifth spot on the list respectively

ASTEROID THAT ELIMINATED DINOSAUR GAVE RISE TO AMAZON RAINFOREST



DID YOU KNOW?

The asteroid impact that wiped out the dinosaurs from the Earth also gave birth to the Amazon rainforest, says a new study. In an analysis of thousands of fossil pollen and leaves, researchers found that the cataclysmic asteroid impact that resulted in the destruction of nearly 75 per cent of all the terrestrial life on the Earth drastically restructured the tropical forests. It also set the stage for the evolution of what has become one of the planet's most-diverse ecosystems – the neo-tropical rainforest, according to the study.

- According to the findings, late Cretaceous rainforests were characterised by an open canopy environment.
- However, plant diversity declined by roughly 45 per cent at the Cretaceous-Paleogene (K/Pg) boundary and extinctions were widespread, particularly among the seed-bearing plants
- While the forests recovered over the subsequent six million years, angiosperms or the flowering plants, came to dominate the forests, said the study
- This transition led to the closed canopy structure and the layered, vertical distribution of plant biodiversity that defines the modern tropical rainforests

SALMA HAYEK JOINS LADY GAGA AND ADAM DRIVER IN RIDLEY SCOTT'S 'HOUSE OF GUCCI'

Salma Hayek is the latest A-lister in the cast of veteran filmmaker Ridley Scott's 'House of Gucci'. The much-awaited movie will feature pop star Lady Gaga as Patrizia Reggiani, the ex-wife of Guccio Gucci's grandson Maurizio Gucci (to be played by Adam Driver). Hayek will essay the role of Pina Auriemma, who was a clairvoyant friend of Reggiani, reported Deadline.

- Reggiani was abandoned after 12 years of marriage by Maurizio Gucci in 1985 for a younger woman. She was tried and convicted of orchestrating her ex-husband's assassination on the steps of his office in Italy in 1995
- She got the nickname the Black Widow during the trial and served 18 years before being released from prison in 2016



MS DHONI ANNOUNCES ANIMATED SPY SERIES 'CAPTAIN 7'

Former India captain Mahendra Singh Dhoni is set to produce an animated series, titled 'Captain 7'. The first season of the spy series, which is currently in pre-production, will be based on Dhoni, the makers said. The 'seven' in the title refers to Dhoni's jersey number, which he donned in many one-day international matches. The project is a joint venture between Mahendra Singh Dhoni and wife Sakshi Singh Dhoni's production house Dhoni Entertainment Pvt Ltd, and Black White Orange Brands Pvt Ltd (BWO).



Billed as the country's first 'animated spy universe', the show will launch with its first season in 2022

PANDEMIC LOSS

NORTH KOREA BECOMES FIRST country to drop out of Tokyo Olympics

North Korea's sports ministry has said that its national Olympic Committee has decided not to participate in the 32nd Olympic Games, in order to protect its players from the world public health crisis caused by Covid-19. However, Japan's Olympic Committee said that North Korea has not yet notified it that it wouldn't participate.

FYI: All International Olympic Committee member countries are required to take part in each Games under the Olympic charter

- It will be the first time for North Korea to miss a Summer Olympics since 1988, when it boycotted the Seoul Games during the Cold War
- The pandemic has already pushed back the Tokyo Games to July 23, 2021 – originally scheduled for 2020 – and the organisers have scrambled to put in place anti-virus measures, such as banning international spectators to ensure the safety of athletes and residents
- While North Korea claims to be coronavirus-free, outsiders remain doubtful about whether the country has escaped the pandemic entirely, given its poor health infrastructure, and a porous border it shares with China, its economic lifeline



Evidence of normalisation of India's economic activity: Gita Gopinath

ECONOMY

International Monetary Fund (IMF) chief Gita Gopinath has said that there is an evidence of normalisation of India's economic activity, ahead of the annual spring meeting of the IMF and World Bank in Washington.

The IMF recently upgraded India's growth projection for the financial year 2021-22 (FY22) upwards to 12.5% from 11.5% earlier, but cautioned that the outlook did not factor in "sever risks", arising out of the ongoing second wave of Covid-19

TAKE THE QUANTUM LEAP TO SUCCESS IN PHYSICS



CLASS: XII - 2020-21

SUBJECT:
PHYSICS (CBSE)

Maximum Marks: 55

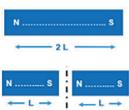
GENERAL INSTRUCTIONS

You may use the following values of physical constants wherever necessary.

$c = 3 \times 10^8$ m/s
 $h = 6.63 \times 10^{-34}$ Js
 $e = 1.6 \times 10^{-19}$ C
 $\mu_0 = 4\pi \times 10^{-7}$ T m A⁻¹
 $\epsilon_0 = 8.854 \times 10^{-12}$ C² N⁻¹ m⁻²
 $\frac{1}{4\pi\epsilon_0} = 9 \times 10^9$ N m² C⁻²
 $m_e = 9.1 \times 10^{-31}$ kg
 mass of neutron = 1.675×10^{-27} kg
 mass of proton = 1.673×10^{-27} kg
 Avogadro's number = 6.023×10^{23} per gram mole
 Boltzmann constant = 1.38×10^{-23} JK⁻¹

SECTION-A (1 mark each)

- Q1. If the radius of inner most electronic orbit of a hydrogen atom is 0.53 \AA then what will be the radius of $n=2$ orbit?
 Q2. The ground state energy of hydrogen atom is -13.6 eV . What are the kinetic and potential energies of electron in this state?
 Q3. At a place the horizontal component of Earth's magnetic field is 0.4 Oersted, angle of dip is 60° . Calculate the value of earth's total field at that place.
 Q4. Consider a magnet of pole strength qm . If a magnet is cut perpendicular to the length in two equal parts, then what is the pole strength of each pole and magnetic dipole moment of each part?
 Q5. A transformer is used to light a 100 W and 110 V lamp from a 220 V mains. If the main current is 0.5 A . What is the efficiency of the transformer?
 Q6. How is electromagnetic wave produced? Draw a sketch of a plane e.m. wave propagating along X-axis depicting the directions of the oscillating electric and magnetic fields.
 Q7. Electromagnetic waves travelling in a medium having relative permeability $\mu_r = 1.3$ and relative permittivity $\epsilon_r = 2.14$. Calculate the speed of electromagnetic waves in that medium.
 Q8. Name the types of e.m. radiations which are used in destroying cancer cells. How these are produced?
 Q9. A proton and an α -particle are accelerated by the same potential difference. What is the ratio of their de-Broglie wavelengths?
 Q10. Why fusion process takes place at very high temperature?
 For question numbers 11, 12, 13 and 14, two statements are given-one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.
 a) Both A and R are true and R is the correct explanation of A



PRACTICE PAPER SET BY MANJU RATHEE, PGT (PHYSICS), UDGAM SCHOOL FOR CHILDREN, AHMEDABAD



- b) Both A and R are true but R is NOT the correct explanation of A
 c) A is true but R is false
 d) A is false and R is also false
 Q11. STATEMENT - 1
 When a charged particle is placed in the cavity in a conducting sphere induced charge on the outer surface of the sphere is found to be uniformly distributed.
 STATEMENT - 2
 Conducting surface is equipotential surface.

Q12. STATEMENT - 1:
 Any charge will move from electric potential $[V_1 \text{ to } V_2]$ by its own; when $V_1 > V_2$.
 STATEMENT - 2:
 Electron moves from $V_1 = 2 \text{ V}$ towards $V_2 = 4 \text{ V}$.

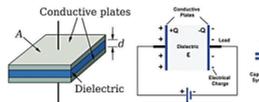
Q13. STATEMENT - 1:
 Different colours travel with different speed in vacuum.
 STATEMENT - 2:
 Wavelength of light depends on refractive index of medium.

Q14. STATEMENT - 1:
 A fish inside a pond will see a person standing outside taller than he is actually.
 STATEMENT - 2:
 Light bend away from the normal as it enters water from air.

SECTION-B (4 marks each)

- Questions 15 and 16 are Case Study based questions and are compulsory.
 Q15. A capacitor consists of two parallel conductive (metal) plates which are not connected or touching each other, but are electrically separated either by air or by some form of a good insulating material such as waxed paper, mica, ceramic or plastic. The insulating layer between a capacitors plates is commonly called the Dielectric. Its capacitance value in Farads, being fixed by the surface area of the conductive plates and the distance of separation between them. By

applying a voltage to a capacitor and measuring the charge on the plates, the ratio of the charge Q to the voltage V will give the capacitance value of the capacitor and is therefore given as: $C = Q/V$



(i) In which of the following forms is the energy stored in a capacitor?

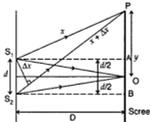
- a) Charge b) Potential
 c) Magnetic field d) Electric field
 (ii) An electric charge of $425 \mu\text{C}$ is removed from a fully charged capacitor of capacitance $8.5 \mu\text{F}$. Its potential will be lowered by:
 a) 75 V b) 100 V c) 85 V d) 50 V

(iii) When a dielectric slab is introduced between the plates of a parallel plate capacitor which remains connected to a battery then charge on the plates relative to earlier charge is:

- a) more b) less
 c) less or may be more d) same
 (iv) A capacitor is connected across a battery and the plate separation of capacitor is increased without removing the battery, then:

- a) capacitance will increase
 b) charge stored will increase
 c) energy stored will decrease
 d) potential difference will increase

Q16. Consider two coherent sources S_1 and S_2 separated by a distance d . Let D be the distance between the screen and the plane of slits S_1 and S_2 . Light waves emitted from S_1 and S_2 reach at different points on



screen by travelling different distances and hence alternate bright and dark fringes are formed on the screen. If two waves reach at a point with phase difference of even multiple of π , bright fringe will be formed and for a phase difference of odd multiple of π , dark fringe will be formed. The fringe width depends on the wavelength (λ) of light used, separation between the slits (d) and distance of slits from the screen (D).

(i) In Young's double-slit experiment, the phase difference between the light waves reaching the third bright fringe from the central fringe will be ($\lambda = 6000 \text{ \AA}$)
 a) 2π b) 4π c) 6π d) Zero

(ii) What happens to the interference pattern the two slits S_1 and S_2 in Young's double experiment are illuminated by two independent but identical sources?
 (a) The intensity of the bright fringes doubled
 (b) The intensity of the bright fringes becomes four times
 (c) Two sets of interference fringes overlap
 (d) No interference pattern is observed

(iii) In Young's double slit experiment the distance between the slit and the screen is doubled and the separation between the slit is reduced to half. The fringe width becomes:
 a) double b) four times
 c) half d) remains unchanged

(iv) A double slit interference experiment is carried out in air and the entire arrangement is dipped in water. The fringe width
 a) increases b) decreases c) remains unchanged. d) fringe pattern disappears.

SECTION-C (2 marks each)

Q17. Derive an expression for the current density of a conductor in terms of the drift speed of electrons.

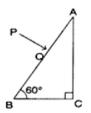
Q18. A square shaped plane coil of area 100 cm^2 of 200 turns carries a steady current of 5 A . It is placed in a uniform magnetic field of 0.2 T acting perpendicular to the plane of the coil. Calculate the torque on the coil when its plane makes an angle of 60° with the direction of the field. In which orientation will the coil be in stable equilibrium?

Q19. Define self-inductance of a coil. Show that magnetic energy required to build up the current I in a coil of self inductance L is given by $\frac{1}{2} LI^2$.

Q20. A wheel with 15 metallic spokes each 60 cm long, is rotated at 360 rev/min in a plane normal to the horizontal component of earth's magnetic field. The angle of dip at that place is 60° . If the emf induced between rim of the wheel and the axle is 400 mV , calculate the horizontal component of earth's magnetic field at the place. How will the induced emf change, if the number of spokes is increased?

Q21. Draw a plot of potential energy of a pair of nucleons as a function of their separation. Write two important conclusions which you can draw regarding the nature of nuclear forces.

Q22. A ray PQ incident normally on the refracting face BA is refracted in the prism BAC made of material of refractive index 1.5. Complete the path of ray through the prism.



From which face will the ray emerge out?
 Q23. A biconvex lens has a focal length $\frac{2}{3}$ times the radius of curvature of either surface. Calculate the refractive index of lens material.

Q24. What is light emitting diode? Draw the V-I characteristic of an LED. Write the factor which controls

(a) wavelength of light emitted,
 (b) intensity of light emitted by an LED.

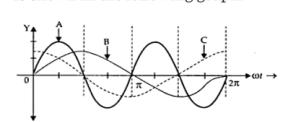
Q25. With the help of a suitable diagram, explain the formation of depletion region in a p-n junction. How does its width change when the junction is
 (i) forward biased (ii) reverse biased?

SECTION-D (5 marks each)

Q26. (a) Using Gauss' law, obtain the expression for the electric field due to an infinitely long straight conductor of linear charge density λ .

(b) A wire AB of length L has linear charge density $\lambda = kx$, where x is measured from the end A of the wire. This wire is enclosed by a Gaussian hollow surface. Find the expression for the electric flux through this surface.

Q27. A device 'X' is connected to an ac source $V = V_0 \sin \omega t$. The variation of voltage, current and power in one cycle is shown in the following graph:



(a) Identify the device 'X'.
 (b) Which of the curves A, B and C represent the voltage, current and the power consumed in the circuit? Justify your answer.

(c) How does its impedance vary with frequency of the ac source? Show graphically.
 (d) Obtain an expression for the current in the circuit and its phase relation with ac voltage.

Q28. (i) Draw a neat and labelled ray diagram of a compound microscope in distinct vision. Explain its working principle and derive magnification formula.
 (ii) Why must both the objective and the eye-piece of a compound microscope have short focal lengths?

FINE-TUNE YOUR ENGLISH

PAPER SET BY FR AGNEL MULTIPURPOSE SCHOOL, VASHI, NAVI MUMBAI

MOCK PAPER
SUBJECT:
ENGLISH (CBSE)
CLASS X
MARKS: 40 TIMEL: 2 hr

SECTION-I

LANGUAGE STUDY

- Q1. A1 Do as directed (Any 4): [4]
 (1) Make a meaningful sentence of your own using the following phrase: "to get into"
 (2) Find out two hidden words of minimum four letters from: 'court-yard'
 (3) Punctuate the following sentence: all of us said the man are waiting for a miracle
 (4) Identify the type of sentence: Kindly leave the room.
 (5) Complete the word chain of nouns: parent, table, e

A2. Do as directed (Any 4): [4]
 (1) Change the following sentence into indirect speech: The Holy Quran says, "Kill not your children because of poverty."
 (2) Identify the clauses and name them: I thought I had been discovered.
 (3) Make a word register of 4 words (minimum 4 letter words) related to: MUSIC

B. Do as directed (Any 1): [2]
 (1) Make two sentences using the word 'brush' as both noun and verb.
 (2) Change the given sentence into positive and comparative degree: She is one of the most brilliant lawyers in this firm.

SECTION-II

TEXTUAL PASSAGES

- Q2. Read the following passage and do the activities:
 1. Arrange the following events in

proper sequence: [2]
 a. The king attended to the wounds of the injured man. b. The king dug the beds to help the hermit. c. The king saw that the hermit was tired. d. The man made peace with the king.

"Do you not see?" replied the hermit. "If you'd not pitied my weakness yesterday and stayed to dig these beds for me, you would have gone back and been killed by that man. So the most important time was when you were digging the beds, and I was the most important man and to do me good was your most important business. Afterwards, the most important time was when you were attending to that man, for if you'd not bound his wounds, he would have died without having made peace with you. So he was the most important man and what you did for him was your most important business. Remember then, there is only one time that is important now! It is the most important time because it's the only time when we have any power: The most necessary person is the one with whom you are, for you do not know whether you will ever have dealings with anyone else; and the most important thing is to do this person good, because for that purpose alone were you sent into this life!"

2. Complete the following: [2]
 a. Helping the hermit prevented _____
 b. The most important time is _____ because _____
 3. Fill in the boxes with the correct forms of the following: [2]

Noun	Verb	Adjective
weakness		necessary

4. a. The most important time was when you attended to that man. (Change it to a Simple Sentence) [1]
 b. If you'd not bound his wounds, he would have died. (Change the Voice) [1]
 5. When you need advice, who do you turn to? Why? [2]

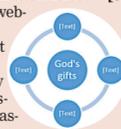
SECTION-III

POETRY

Q3. Read the following extract and do the given activities: [5]

1. Complete the web-chart:
 So strength first made a way;
 Then beauty flow'd, then wisdom, honour, pleasure:
 When almost all was out, God made a stay.

Perceiving that alone of all His treasures
 Rest in the bottom lay.
 For if I should (said He)
 Bestow this jewel also on my creature,
 He would adore my gifts instead of me,
 And rest in Nature, not the God of Nature.
 So both should losers be.
 Yet let him keep the rest,
 But keep them with repining restlessness:
 Let him be rich and weary, that at last,
 If goodness lead him not, yet weariness



- ness
 May toss him to my breast.
 2. Why did God hold back 'rest'?
 3. Pick out an example of Poetic Inversion from the above extract.

SECTION-IV

NON-TEXTUAL PASSAGE

Q4. A Read the given passage and complete the activities given below: [5]

1. Complete the following sentences:
 a. A paper-based battery may look like _____
 b. These batteries do not require _____

Engineers in New York have invented a folded paper device that looks like a decorated art project. But don't be fooled. This is actually a paper-based battery. No, it doesn't look like any of those metal batteries running flashlights or smartphones. This alternative to electronics is based on paper. It represents a step forward in the field of paper electronics, or papertronics. In these systems, the battery can be printed on a page. Well, most of it can: The battery's power consists of living bacteria.

Papertronics are simple to make and inexpensive. These batteries are also flexible and disposable. And powered by germs, they need no electrical outlet to recharge. They just need more bacteria, which can be found everywhere - includ-

ing in dirty water.

Most batteries use chemicals to generate electricity. Substituting chemicals with bacteria can be an advantage. They are cheap, self-repairing and self-maintained.

2. What are paper-based batteries powered by?
 3. Find synonyms of the following from the passage:
 a. substitute b. easily modified
 4. Rewrite the sentence using 'Not only... but also'
 They are cheap and self-repairing.

Summary Writing
 (B) Read the above passage given in Q. No. 4 (A) and write its summary in a paragraph. Suggest a suitable title. [5]

SECTION-V

WRITING SKILL

Q5. A Read the following passage and make a tree diagram: [5]

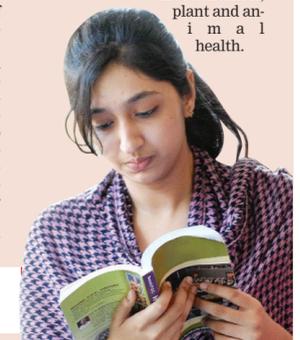
There are three major types of pollution: air pollution, water pollution and soil pollution.

A major source of air pollution is the burning of fossil fuels. Vehicle and factory emissions are common sources of this type of air pollution. Air pollution contributes to respiratory problems such as asthma, lung cancer, chronic bronchitis, and other lung ailments. Nitrogen and sulphur oxides in the air contribute to acid rain.

A major source of water pollu-

tion is runoff from agricultural fields, industrial sites, or urban areas. Runoff disrupts the water body's natural balance. Raw sewage is another type of water pollutant. When sewage gets into the drinking water supply, serious stomach and digestive issues may result, including the spread of diseases such as typhoid or dysentery. A third source of water pollution is trash. Improperly disposed of items, such as plastic bags, fishing line, and other materials may accumulate in the water and lead to the premature death of animals that get tangled within the garbage.

Soil can become polluted by industrial sources or the improper disposal of toxic chemical substances. Common sources of soil pollution include asbestos, lead and overuse of pesticides. Soil pollution affect human, plant and animal health.



These questions are for practice 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. Photographs taken for representative purpose only.