



INFINITY VISION
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PRACTICE PAPER

PHYSICS

CLASS - X

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Did you know that board toppers
practice at least 20 sample paper before
actual exam, to master the art of answer
writing

Schedule of Various Engineering Entrance Exams.

Name of Exams	Number of Seats	Months of Notification	Tentative Date of Entrance Exams
Joint Entrance Examination (JEE-Main)	Approx. 5.5 Lakh seats became accessible through JEE	Oct./Nov.	Offline Exam: 1st Week of April
Join Entrance Examination (JEE – Adv.)	Approx. 10575 seats	Oct./Nov.	Offline Exam only 3rd week of May
Vellore Institute of Technology (VITEE) Vellore	Approx. 3500 seats	Oct./Nov.	Computer Based Test: Mild of April
Birla Institute of Technology and Science (BITS – Pilani) Rajasthan	Approx. 2000 seats	Dec./Jan	Online Test: 2nd week of May to Last week of May
Aligarh Muslim University Combined Entrance Test (AMU - CET) Aligarh	Approx. 365 seats only in B.Tech	Oct. /Nov.	Last week of April
Guru Gobind Singh Indraprastha University (IPU-CET) New Delhi	Approx. 4360 seats	Nov./Dec.	1st week of May
Manipal University Online Entrance Test (MU-OET) manipal	Approx 6500 seats	Nov./Dec.	Online Ent. Test between: Mid April and Mid May
MHT-CET (B. Tech) Maharashtra	-	December	1st Week of May
Uttar Pradesh State Entrance Examination (UP-SEE) Lucknow	-	Dec/Jan.	Last week of April

Schedule of Medical Entrance Examinations

Name of Exams	No. of Seats	Months of Notification	Tentative Date of Exams
NEET (National Eligibility cum Entrance Test)	***15% All Quota Seats for merit position in the Govt. Medical/Dental Colleges of India	Nov /Dec	1st Week of May
AIIMS (All India Institute of Medical Sciences)	**Approx. 672 seats in all AIIMS in India	Dec /Jan	End of May/ 1st Week of June
JIPMER (Jawaharlal Institute of Postgraduate Medical Education & Research)	Approx. 150 seats for Puducherry-Campus and 50 seats for karaikal-Campus	Oct /Nov	1st week of June

Practice Paper - 1

Class - X (Physics)

Time allowed: 2hrs

Max Marks:80

Answers to this Paper must be written on the paper provided separately.

You will not be allowed to write during the first 15 minutes.

This time is to be spent in reading the question paper.

The time given at the head of this Paper is the time allowed for writing the answers.

Section I is compulsory. Attempt **any four** questions from **Section II**.

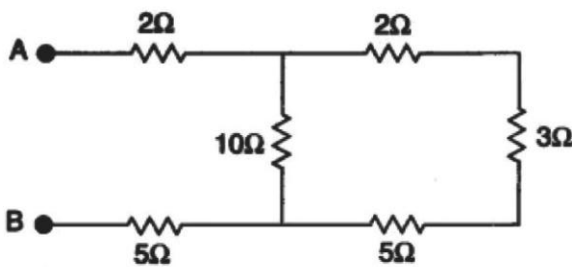
The intended marks for questions or parts of questions are given in brackets [].

SECTION - I

1. (a) State two differences between light waves and sound waves. [2]

 - (b) Two waves of the same pitch have their amplitudes in the ratio 2 : 3.
 (i) What will be the ratio of their loudness ?
 (ii) What will be the ratio of their frequencies ? [2]

 - (c) Give two differences between a d.c. motor and an a.c. generator. [2]

 - (d) Six resistances are connected together as shown in the figure. Calculate the equivalent resistance between the points A and B. [2]
- 
- (e) (i) Which part of an electrical appliance is earthed ?
 (ii) State a relation between electrical power, resistance and potential difference in an electrical circuit. [2]
-
2. (a) How is work done by a force measured when the force :
 (i) is in the direction of displacement.
 (ii) is at an angle to the direction of displacement. [2]

 - (b) State the energy changes in the following while in use :
 (i) Burning of a candle.
 (ii) A steam engine. [2]

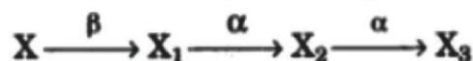
 - (c) (i) A scissor is a multiplier.
 (ii) 1 kWh = J. [2]

 - (d) Explain the motion of a planet around the sun in a circular path. [2]

 - (e) Rajan exerts a force of 150 N in pulling a cart at a constant speed of 10 m/s. Calculate the power exerted. [2]

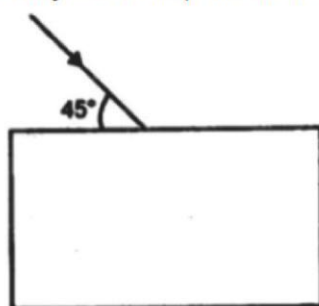
3. (a) Define the term 'Heat capacity' and state its S.I. unit. [2]
 (b) What is meant by Global warming? [2]
 (c) How much heat energy is released when 5g of water at 20 °C changes to ice at 0 °C?
 [Specific heat capacity of water = $4.2 \text{ Jg}^{-1} \text{ } ^\circ\text{C}^{-1}$.
 Specific latent heat of fusion of ice = 336 Jg^{-1}] [2]
 (d) Which of the radioactive radiations :
 (i) Can cause severe genetical disorders.
 (ii) Are deflected by an electric field? [2]

(e) A radioactive nucleus undergoes a series of decays according to the sequence



If the mass number and atomic number of X_3 are 172 and 69 respectively, what is the mass number and atomic number of X? [2]

4. (a) Draw the diagram given below and clearly show the path taken by the emergent ray. [2]



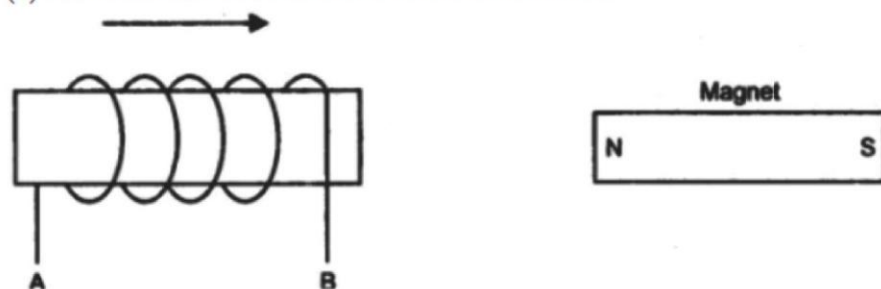
- (b) (i) What is consumed using different electrical appliances, for which electricity bills are paid?
 (ii) Name a common device that uses electromagnets. [2]
 (c) (i) A ray of light passes from water to air. How does the speed of light change?
 (ii) Which colour of light travels fastest in any medium except air? [2]
 (d) Name the factors affecting the critical angle for the pair of media. [2]
 (e) (i) Name a prism required for obtaining a spectrum of Ultraviolet light.
 (ii) Name the radiations which can be detected by a thermopile. [2]

SECTION - II

5. (a) (i) Define the term 'specific latent heat of fusion' of a substance.
 (ii) Name the liquid which has the highest specific heat capacity.
 (iii) Name two factors on which the heat absorbed or given out by a body depends. [3]
 (b) (i) An equal quantity of heat is supplied to two substances A and B. The substance A shows a greater rise in temperature. What can you say about the heat capacity of A as compared to that of B?
 (ii) What energy change would you expect to take place in the molecules of a substance when it undergoes :
 1. a change in its temperature?
 2. a change in its state without any change in its temperature? [3]
 (c) 50 g of ice at 0 °C is added to 300 g of a liquid at 30 °C. What will be the final temperature of the mixture when all the ice has melted? The specific heat capacity of the liquid is $2.65 \text{ Jg}^{-1} \text{ } ^\circ\text{C}^{-1}$ while that of water is $4.2 \text{ Jg}^{-1} \text{ } ^\circ\text{C}^{-1}$. Specific latent heat of fusion of ice = 336 Jg^{-1} . [4]

6. (a) Draw a simplified diagram of a lemon crusher, indicating direction of load and effort. [2]
- (b) (i) Name the physical quantity measured in terms of horse power.
 (ii) A nut is opened by a wrench of length 20cm. If the least force required is 2N, find the moment of force needed to loosen the nut.
 (iii) Explain briefly why the work done by a fielder when he takes a catch in a cricket match is negative. [4]
- (c) A block and tackle system has $V.R = 5$.
 (i) Draw a neat labelled diagram of a system indicating the direction of its load and effort.
 (ii) Rohan exerts a pull of 150 Kgf. What is the maximum load he can raise with this pulley system if its efficiency = 75% ? [4]

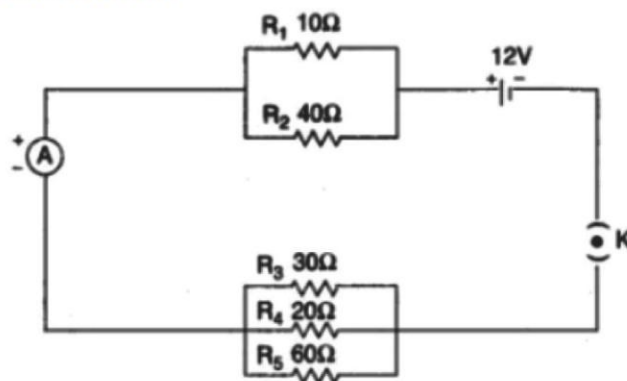
7. (a) (i) Name two factors on which the magnitude of an induced e.m.f. in the secondary coil depends.
 (ii) In the following diagram an arrow shows the motion of the coil towards the bar magnet.
 (1) State in which direction the current flows, A to B or B to A?
 (2) Name the law used to come to the conclusion. [4]



- (b) A nucleus ${}_{11}\text{Na}^{24}$ emits a beta particle to change into Magnesium (Mg)
 (i) Write the symbolic equation for the process.
 (ii) What are numbers 24 and 11 called ? [3]
 (iii) What is the general name of ${}_{12}\text{Mg}^{24}$ with respect to ${}_{11}\text{Na}^{24}$?
- (c) In a cathode ray tube state :
 (i) The purpose of covering cathode by thorium and carbon.
 (ii) The purpose of the fluorescent screen.
 (iii) How is it possible to increase the rate of emission of electrons. [3]

8. (a) Calculate the quantity of heat that will be produced in a coil of resistance $75\ \Omega$ if a current of 2A is passed through it for 2 minutes. [2]
- (b) (i) A substance has nearly zero resistance at a temperature of 1 K. What is such a substance called ?
 (ii) State any two factors which affect the resistance of a metallic wire. [3]

(c) Five resistors of different resistances are connected together as shown in the figure. A 12 V battery is connected to the arrangement. Calculate :



- (i) the total resistance in the circuit.
 (ii) the total current flowing in the circuit.

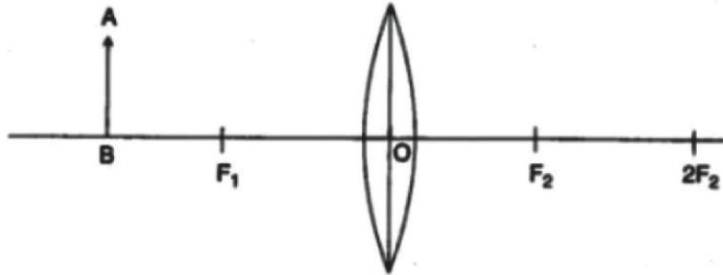
9. (a) Name the radiations:
- (i) That are used for photography at night.
 - (ii) Used for detection of fracture in bones.
 - (iii) Whose wavelength range is from 100 \AA to 4000 \AA (or 10 nm to 400 nm).

[3]

- (b) (i) Can the absolute refractive index of a medium be less than one ?
- (ii) A coin placed at the bottom of a beaker appears to be raised by 4.0 cm . If the refractive index of water is $4/3$, find the depth of the water in the beaker.

[3]

- (c) An object AB is placed between $2F_1$ and F_1 on the principal axis of a convex lens as shown in the diagram.



Copy the diagram and using three rays starting from point A, obtain the image of the object formed by the lens.

[4]

10. (a) Two resistors of 4Ω and 6Ω are connected in parallel to a cell to draw 0.5 A current from the cell.

- (i) Draw a labelled circuit diagram showing the above arrangement.
- (ii) Calculate the current in each resistor.

[4]

- (b) (i) What is an Ohmic resistor ?
- (ii) Two copper wires are of the same length, but one is thicker than the other.
- (1) Which wire will have more resistance ?
 - (2) Which wire will have more specific resistance ?

[3]

- (c) (i) Two sets A and B, of the three bulbs each, are glowing in two separate rooms. When one of the bulbs in set A is fused, the other two bulbs also cease to glow. But in set B, when one bulb fuses, the other two bulbs continue to glow. Explain why this phenomenon occurs.
- (ii) Why do we prefer arrangements of Set B for house circuiting ?

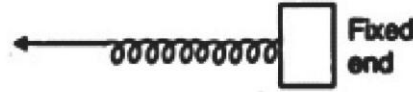
[3]

Practice Paper - 2

Class - X (Physics)

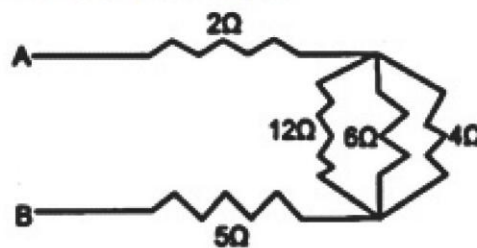
SECTION - I

1. (a) Give any two effects of a force on a non-rigid body. [2]
 (b) One end of a spring is kept fixed while the other end is stretched by a force as shown in the diagram.



- (i) Copy the diagram and mark on it the direction of the restoring force. [2]
 (ii) Name one instrument which works on the above principle. [2]
 (c) (i) Where is the centre of gravity of a uniform ring situated ?
 (ii) "The position of the centre of gravity of a body remains unchanged even when the body is deformed." State whether the statement is true or false. [2]
 (d) A force is applied on a body of mass 20 kg moving with a velocity of 40 ms^{-1} . The body attains a velocity of 50 ms^{-1} in 2 seconds. Calculate the work done by the body. [2]
 (e) A type of single pulley is very often used as a machine even though it does not give any gain in mechanical advantage.
 (i) Name the type of pulley used.
 (ii) For what purpose is such a pulley used ? [2]

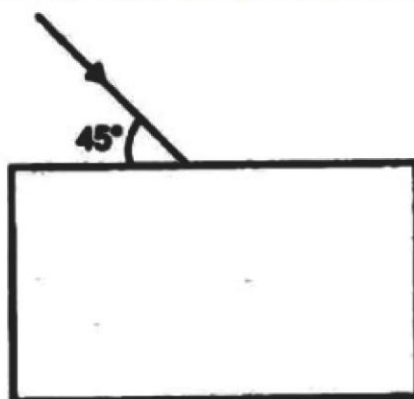
2. (a) Rishi is surprised when he sees water boiling at 115°C in a container. Give reasons as to why water can boil at the above temperature. [2]
 (b) (i) Why does a current carrying, freely suspended solenoid rest along a particular direction ?
 (ii) State the direction in which it rests. [2]
 (c) Find the equivalent resistance between points A and B. [2]



- (d) Give two similarities between an A.C. generator and a D.C. motor. [2]
 (e) (i) Why is a cathode ray tube evacuated to a low pressure ?
 (ii) What happens if the negative potential is changed on a grid ? [2]

3. (a) A device is used to transform 12V a.c. to 200 V a.c.
 (i) What is the name of this device ?
 (ii) Name the principle on which it works. [2]
- (b) (i) Which materials is the calorimeter commonly made of ?
 (ii) Give one reason for using this material. [2]
- (c) (i) Name a metal that is used as an electron emitter.
 (ii) Give one reason for using this metal. [2]
- (d) Complete the following nuclear changes: [2]
- (i) ${}_{11}^{24}\text{Na} \rightarrow \dots \text{Mg}^{++} + {}_{-1}^0\beta$
 (ii) ${}_{92}^{238}\text{U} \rightarrow {}_{90}^{234}\text{Th} + \dots + \text{Energy}.$
- (e) (i) Which radiation produces maximum biological damage ?
 (ii) What happens to the atomic number of an element when the radiation named by you in part (i) above, are emitted ? [2]

4. (a) Draw the diagram given below and clearly show the path taken by the emergent ray. [2]



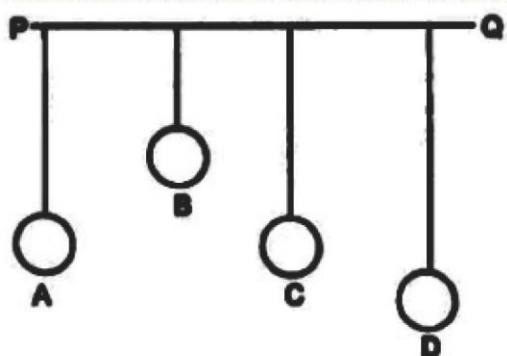
- (b) (i) What is consumed using different electrical appliances, for which electricity bills are paid ?
 (ii) Name a common device that uses electromagnets. [2]
- (c) (i) A ray of light passes from water to air. How does the speed of light change ?
 (ii) Which colour of light travels fastest in any medium except air ? [2]
- (d) Name the factors affecting the critical angle for the pair of media. [2]
- (e) (i) Name a prism required for obtaining a spectrum of Ultraviolet light.
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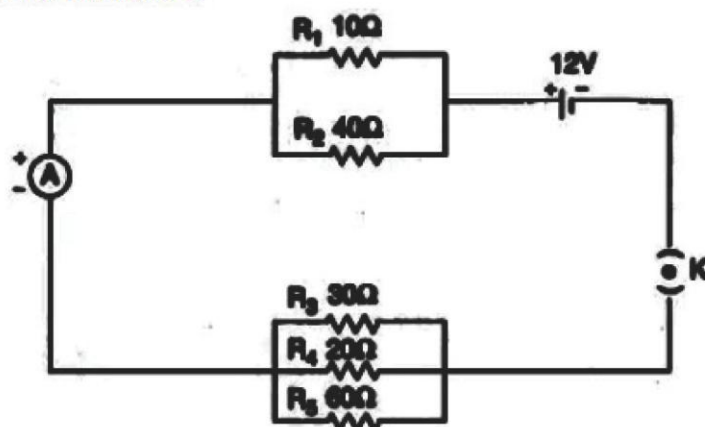
SECTION - II

5. **(a)** Heat energy is supplied at a constant rate to 100g of ice at 0 °C. The ice is converted into water at 0°C in 2 minutes. How much time will be required to raise the temperature of water from 0 °C to 20 °C ? [Given : sp. heat capacity of water = $4.2 \text{ Jg}^{-1} \text{ }^{\circ}\text{C}^{-1}$, sp. latent heat of ice = 336 Jg^{-1}]. [4]
- (b)** Specific heat capacity of substance A is $3.8 \text{ Jg}^{-1} \text{ }^{\circ}\text{K}^{-1}$ whereas the Specific heat capacity of substance B is $0.4 \text{ Jg}^{-1} \text{ }^{\circ}\text{K}^{-1}$.
- (i) Which of the two is a good conductor of heat ?
- (ii) How is one led to the above conclusion ?
- (iii) If substances A and B are liquids then which one would be more useful in car radiators ? [3]
- (c)** (i) State any two measures to minimize the impact of global warming.
- (ii) What is the Greenhouse effect ? [3]
6. **(a)** (i) With reference to their direction of action, how does a centripetal force differ from a centrifugal force ?
- (ii) State the Principle of conservation of energy.
- (iii) Name the form of energy which a body may possess even when it is not in motion. [3]
- (b)** A coolie is pushing a box weighing 1500 N up an inclined plane 7.5m long on to a platform, 2.5m above the ground.
- (i) Calculate the mechanical advantage of the inclined plane.
- (ii) Calculate the effort applied by the coolie.
- (iii) In actual practice, the coolie needs to apply more effort than what is calculated. Give one reason why you think the coolie needs to apply more effort. [3]
- (c)** A block and tackle system of pulleys has a velocity ratio 4.
- (i) Draw a labelled diagram of the system indicating clearly the points of application and directions of load and effort.
- (ii) What is the value of the mechanical advantage of the given pulley system if it is an ideal pulley system ? [4]
7. **(a)** (i) Where should an object be placed so that a real and inverted image of the same size as the object is obtained using a convex lens ?
- (ii) Draw a ray diagram to show the formation of the image as specified in the part a (i). [4]
- (b)** (i) Why does the Sun appear red at sunrise ?
- (ii) Name the subjective property of light related to its wavelength. [3]
- (c)** Jatin puts a pencil into a glass container having water and is surprised to see the pencil in a different state.
- (i) What change is observed in the appearance of the pencil ?
- (ii) Name the phenomenon responsible for the change.
- (iii) Draw a ray diagram showing how the eye sees the pencil. [3]

8. (a) (i) State the safe limit of sound level in terms of decibel for human hearing. [2]
 (ii) Name the characteristic of sound in relation to its waveform. [2]
- (b) A person standing between two vertical cliffs and 480 m from the nearest cliff shouts. He hears the first echo after 3s and the second echo 2s later.
- Calculate:
- (i) The speed of sound. [3]
 (ii) The distance of the other cliff from the person. [3]
- (c) In the diagram below, A, B, C, D are four pendulums suspended from the same elastic string PQ. The length of A and C are equal to each other while the length of pendulum B is smaller than that of D. Pendulum A is set into a mode of vibrations.



- (i) Name the type of vibrations taking place in pendulums B and D ?
 (ii) What is the state of pendulum C ?
 (iii) State the reason for the type of vibrations in pendulums B and C. [5]
9. (a) Calculate the quantity of heat that will be produced in a coil of resistance $75\ \Omega$ if a current of 2A is passed through it for 2 minutes. [2]
- (b) (i) A substance has nearly zero resistance at a temperature of 1 K. What is such a substance called ?
 (ii) State any two factors which affect the resistance of a metallic wire. [3]
- (c) Five resistors of different resistances are connected together as shown in the figure. A 12 V battery is connected to the arrangement. Calculate :



- (i) the total resistance in the circuit.
 (ii) the total current flowing in the circuit.



10. **(a)** Name the three main parts of a Cathode Ray Tube. [3]
- (b)** (i) What is meant by Radioactivity ?
- (ii) What is meant by nuclear waste ?
- (iii) Suggest one effective way for the safe disposal of nuclear waste. [3]
- (c)** (i) Draw a simple labelled diagram of a d.c. electric motor.
- (ii) What is the function of the split rings in a d.c. motor ?
- (iii) State one advantage of a.c. over d.c. [4]

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 **7042433991, 7042220403, 7042433669**

helpdesk.infinityvision@gmail.com