Sample Paper 5

ICSE Class X 2023-24
Physics
Science Paper - 1

Time: 2 Hours   **Max. Marks: 80**

General Instructions:
1.   Answer to this Paper must be written on the paper provided separately.
2.   You will not be allowed to write during first 15 minutes.
3.   This time is to be spent in reading the question paper.
4.   The time given at the head of this Paper is the time allowed for writing the answers.
5.   Section A is compulsory. Attempt any four questions from Section B.
6.   The intended marks for questions or parts of questions are given in brackets [ ].

SECTION - A

(Attempt all questions from this Section.)

QUESTION 1.

Choose the correct answers to the questions from the given options.   [15]

(Do not copy the questions, write the correct answer only.)

(i)   As a body moves in a circular path, inward seeking force is called ....
    (a) Centripetal force   (b) Centrifugal force
    (c) Tension force   (d) Tangential force

(ii)   SI unit of work is ....
    (a) joule   (b) dyne
    (c) newton   (d) erg

(iii) A scooter develops a power of 1HP while running at 36 km hr^{-1}. Calculate the force generated by its engine.
    (a) 60 N   (b) 45 N
    (c) 80 N   (d) 75 N

(iv)   Which of the following radiation is most ionising ?
    (a) β-particles
    (b) α-particles
    (c) γ-radiation
    (d) X-rays

(v) **Assertion :** When a battery is short-circuited, the terminal voltage is zero.
     Reason : In the situation of a short-circuit, the current is zero
     (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
     (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
     (c) Assertion (A) is true but reason (R) is false.
     (d) Assertion (A) is false but reason (R) is true.

(vi) When the object is at infinity, what is the nature of image formed by concave lens ?
     (a) Real, inverted, enlarged   (b) Virtual, erect, diminished
     (c) Real, inverted, same size   (d) Virtual, erect, enlarged

(vii) Amphitheatres and auditorium walls are fitted with .... To avoid the echoing of sound.
     (a) sound absorbers such as foam board (b) wooden wall
     (c) granite   (d) Italian marble

(viii) A string is stretched between two nails fixed in the opposite walls and plucked from middle. The vibrations produced by the string are :
     (a) forced vibrations   (b) damped vibrations
     (c) free vibrations   (d) resonant vibrations

(ix) The power of a D.C. motor can be increased :
     (a) by laminating its soft iron core
     (b) by increasing the strength of current flowing through it
     (c) by increasing number of turns in its coil
     (d) all of these

(x) Kilowatt hour and kilowatt are :
     (a) SI units of power and electric energy
     (b) commercial units of electric energy and power
     (c) commercial units of power and electric energy
     (d) SI units of electric energy and power

(xi) Two resistors of 2 Ω each are connected in a parallel. The equivalent resistance is :
     (a) less than 2 Ω but more than 1 Ω
     (b) between 4 Ω and 2 Ω
     (c) one ohm
     (d) four ohm

(xii) A copper calorimeter contains 50 g of water at 16°C. When 40 g of water at 36°C is added, the resulting temperature of the mixture is 24°C. Calculate the heat capacity of the calorimeter.
     (a) 42 J°C^{-1} (b) 4 J°C^{-1}
   (c) 24 J°C^{-1} (d) 2 J°C^{-1}

(xiii) Water at 80°C is poured into a bucket containing 1.5 kg of crushed ice at 0°C, such that all the ice melts and the final temperature records is 0°C. Calculate the amount of hot water added to the ice.

[Take specific heat capacity of water 4200 $J\,g^{-1}{}^{\circ}C^{-1}$ and specific latent heat of ice $= 336 \times 10^3 J\,kg^{-1}$]

(a) 0.5 kg   (b) 3.5 kg
(c) 2.5 kg   (d) 1.5 kg

(xiv) A ray of light travels undeviated on passing through the optical boundary
(a) both have the same refractive index
(b) the ray makes an angle of 0° with the normal
(c) if both mediums are same
(d) all the above

(xv) A concave lens always forms :
(a) real, inverted and enlarged image   (b) virtual, erect and enlarged image
(c) virtual, inverted and enlarged image   (d) virtual, erect and diminished image

QUESTION 2.

(i) (a) Write an expression to show the relationship between mechanical advantage, velocity ratio and efficiency for a simple machine. [3]
    (b) Copy and complete the following nuclear equations by filling in the correct values in the blanks :

    $$^{238}_{92}P \xrightarrow{\ \alpha\ } {}_{...}P_1^{...} \xrightarrow{\ -\beta\ } {}_{...}P_2^{...} \xrightarrow{\ -\beta\ } {}_{...}P_3^{...}$$

    (c) Who confirmed the first ever nuclear reaction?

(ii) From the given figure, calculate moment of force about (a) P and (b) Q. [2]
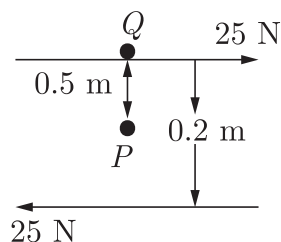
(iii) A type of single pulley is very often used as a machine even though it does not give any gain in mechanical advantage. [2]
(a) Name the type of pulley used.
(b) For what purpose is such a pulley used?

(iv) A body is thrown vertically upwards. Its velocity keeps on decreasing. What happens to its kinetic energy as its velocity becomes zero? [2]

(v)   What is the relation between SI and CGS units of work?   [2]

(vi) Out of the three fuses with current ratings 5 A, 10 A, 15 A, which one is to be connected in
      a geyser circuit marked 3 KW, 220 V? Give reason for your answer.   [2]

(vii) How is the frequency of a stretched string related to: [2]
      (a) its length ?
      (b) its tension ?

QUESTION 3.

(i)   (a) If the lens is placed in water instead of air, how does its focal length change?   [2]
       (b) Which lens, thick or thin has greater focal length?

(ii)   (a) What happens to the resistivity of semi-conductors with the increase of temperature?
                                                                               [2]
       (b) For a fuse, higher the current rating .... is the fuse wire.

(iii) Distinguish between terminal potential difference and emf of a cell.   [2]

(iv)   A piece of ice of mass 40 g is dropped into 200 g of water at 50°C.   [2]
       Calculate the final temperature of water after all the ice has melted. (specific heat capacity
       of water $= 4200\,\text{J/kg}\,°\text{C}$, specific latent heat of fusion of ice $= 336 \times 10^3\,\text{J/kg}$).

(v)   Arrange α, β and γ-rays in ascending order with respect to their (i) penetrating power, (ii)
       ionising power and (iii) biological effect.   [2]

SECTION - B

(Attempt any four questions.)

QUESTION 4.

(i)   (a) How is the refractive index of a material related to :   [3]
           (i) real and apparent depth ?
           (ii) velocity of light in vacuum or air and the velocity of light in a given medium ?
       (b) State the conditions required for total internal reflection of light to take place.

(ii)   (a) An object is placed in front of a converging lens at a distance greater than twice the
           focal length of the lens. Draw a ray diagram to show the formation of the image.   [3]
       (b) Mention one difference between reflection of light from a plane mirror and total internal
           reflection of light from a prism.

(iii) (a) An object AB is placed between O and F_1 on the principal axis of converging lens as shown in the diagram. [4]
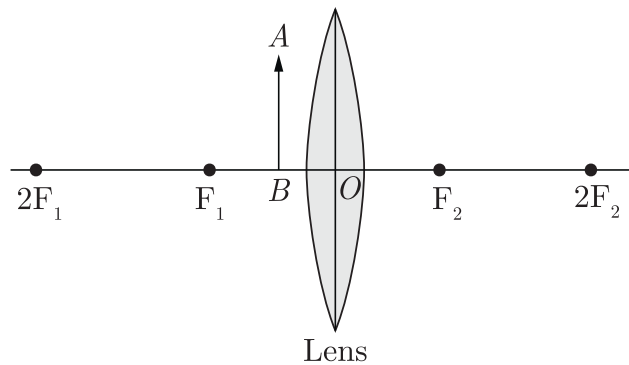

Lens

Copy the diagram and by using three standard rays starting from point A, obtain an image of the object AB.

(b) An object is placed at a distance of 12 cm from a convex lens of focal length 8 cm. Find :
  (i) the position of the image
 (ii) nature of the image

QUESTION 5.

(i) (a) Define power of a lens and write its S.I. unit. [3]
  (b) A convex lens of power 4 D is placed at a distance of 40 cm from a wall. At what distance from the lens should a candle be placed so that its image is formed on the wall ?

(ii) A linear object is placed on the axis of a lens. An image is formed by refraction in the lens. For all positions of the object on the axis of the lens, the positions of the image are always between the lens and the object. [3]
  (a) Name the lens.
  (b) Draw a ray diagram to show the formation of the image of an object placed in front of the lens at any position of your choice except infinity.

(iii) (a) The figure below shows a tuning fork with one of its prongs fastened to one end of a spring whose other end is fastened to a rigid support. When the tuning fork is made to vibrate, how does the pattern of the coils of the spring change ? [4]
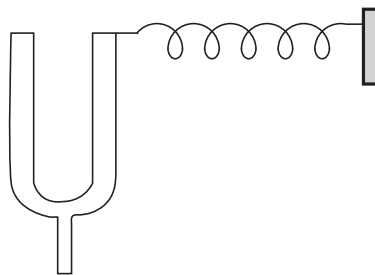
(b) What do you understand by the terms ?
    (i) Wavelength (ii) Frequency and (iii) Amplitude of a wave.
(c) Which of the above determine the loudness of a sound wave ? What is the relationship between loudness and your answer in (b) above?

QUESTION 6.

(i) Rahul and Priya are playing on a multistorey building. Suddenly Rahul throws a toy of mass 1 kg the toy is falling under the affect of gravity and after sometimes, it reaches on the ground. [3]
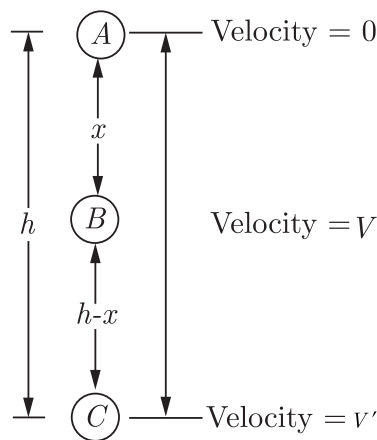
(a) What is the momentum of the toy after 5 s?
(b) What is the height of the freely falling body?

(ii) A pulley system has a velocity ratio of 4 and an efficiency of 90%. Calculate: [3]
(a) the mechanical advantage of the system.
(b) the effort required to raise a load of 300 N by the system.

(iii) A block of mass 30 kg is pulled up a slope (diagram below) with a constant speed by applying a force of 200 N parallel to the slope. A and B are initial and final positions of the block. [4]
(a) Calculate the work done by the force in moving the block from A to B.
(b) Calculate the potential energy gained by the block.
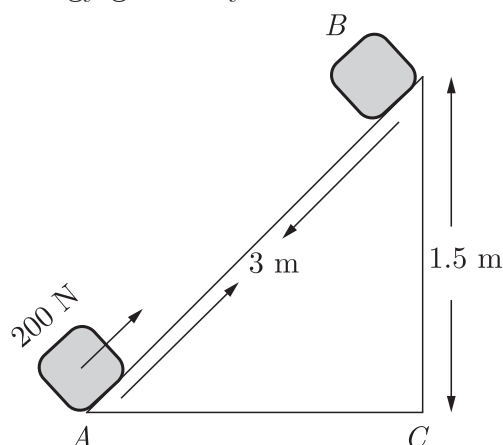
QUESTION 7.

(i) A man fires a gun and hears its echo after 5 s. The man then moves 310 m towards the hill and fires his gun again. This time he hears the echo after 3 s. Calculate the speed of the sound.   [3]

(ii) (a) State two characteristics of a good thermion emitter.   [3]
     (b) State two factors upon which the rate of emission of thermions depends.
     (c) When does the nucleus of an atom tend to be radioactive ?

(iii) A block and tackle system of pulleys has a velocity ratio 4.   [4]
     (a) Draw a labelled diagram of the system indicating clearly the points of application and directions of load and effort.
     (b) What is the value of the mechanical advantage of the given pulley system if it is an ideal pulley system?

QUESTION 8.

(i) (a) (i) Why does a current carrying freely suspended solenoid rest along a particular direction?   [3]
     (ii) State the direction in which it rests.
     (b) Give two similarities in an A.C. generator and a D.C. motor.

(ii) Complete and rewrite the following nuclear reaction by filling the blanks.   [3]
$$^{235}_{...}U \longrightarrow \,^{...}_{90}Th + \,^{4}_{2}He$$
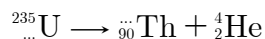
(iii) The following circuit diagram shows three resistors 2 ohm, 4 ohm and R ohm connected to a battery of emf 2 V and internal resistance 3 ohm. A main current of 0.25 A flows through the circuit.   [4]
     (a) What is the P.D. across the 4 ohm resistor?
     (b) Calculate the P.D. across the internal resistance of the cell.
     (c) What is the P.D. across R and 2 ohm resistors?
     (d) Calculate the value of R.
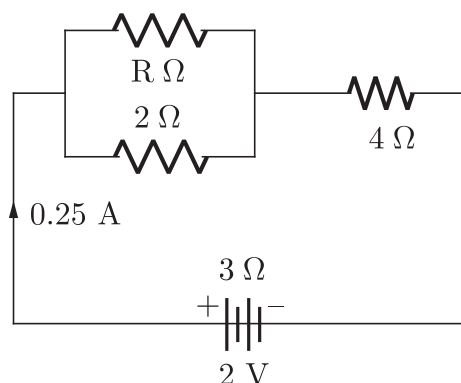
QUESTION 9.

(i)   A vessel of negligible heat capacity contains 40 g of ice in it at 0°C. 8 g of steam at 100°C is passed into the ice to melt it. Find the final temperature of contents of the vessel.   [3]
(Specific latent heat of vaporisation of steam $= 2268$ J/g,
Specific latent heat of fusion of ice $= 336$ J/g,
Specific heat capacity of water $= 4.2$ J/g °C

(ii) (a) Write an expression for the heat energy liberated by a hot body.   [3]
(b) Some heat is provided to a body to raise its temperature by 25°C.
What will be the corresponding rise in temperature of the body as shown on the kelvin scale ?
(c) What happens to the average kinetic energy of the molecules as ice melts at 0°C ?

(iii) Two pendulums C and D are suspended from a wire as shown in the given figure. Pendulum C is made to oscillate by displacing it from its mean position. It is seen that D also starts oscillating.   [4]
(i) Name the type of oscillation, C will execute.
(ii) Name the type of oscillation, D will execute.
(iii) If the length of D is made equal to C, then what difference will you notice in the oscillations of D?
(iv) What is the name of the phenomenon when the length of D is made equal to C ?

****
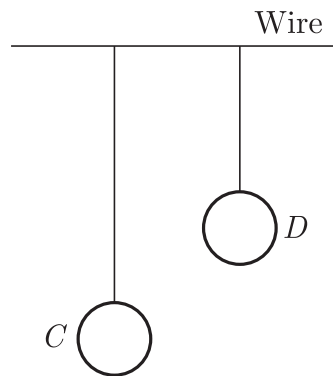
Pre Board Sample Papers Exam Feb 2024
ICSE Class 10th Physics
Click PDF Icon and Download Sample Papers 30 Sets
If you are not able to click papers, please see last page of this PDF

Physics Paper 1
Paper | Solution
PDF | PDF

Physics Paper 2
Paper | Solution
PDF | PDF

Physics Paper 3
Paper | Solution
PDF | PDF

Physics Paper 4
Paper | Solution
PDF | PDF

Physics Paper 5
Paper | Solution
PDF | PDF

Physics Paper 6
Paper | Solution
PDF | PDF

Physics Paper 7
Paper | Solution
PDF | PDF

Physics Paper 8
Paper | Solution
PDF | PDF

Download Chapterwise Previous 20 Years Exam Question Bank
Questions Worksheet and Solutions
⬇ DOWNLOAD

Physics Paper 9
Paper | Solution
PDF | PDF

Physics Paper 10
Paper | Solution
PDF | PDF

Physics Paper 11

Paper	Solution
PDF	PDF

Physics Paper 12

Paper	Solution
PDF	PDF

Physics Paper 13

Paper	Solution
PDF	PDF

Physics Paper 14

Paper	Solution
PDF	PDF

Physics Paper 15

Paper	Solution
PDF	PDF

Physics Paper 16

Paper	Solution
PDF	PDF

Physics Paper 17

Paper	Solution
PDF	PDF

Physics Paper 18

Paper	Solution
PDF	PDF

Physics Paper 19

Paper	Solution
PDF	PDF

Physics Paper 20

Paper	Solution
PDF	PDF

ICSE Pre Board Sample Papers
Class 10th Exam 2024
Click your subject and Download 20 Set Sample Papers

MATHS	**PHSYICS**
CHEMISTRY	**BIOLOGY**
HIS. & CIVICS	**GEOGRAPHY**
ENGLISH - I	**ENGLISH - II**
COMPUTER	**हिंदी**

File is not opening after click or touch ? What to do ?
If sample paper file is not opening after click or touch, it means links doesn't work in you mobile PDF opening app. It seems that your mobile has WPS office, in which links doesn't work.
Open this file in Google Drive only.

क्लिक/टच करने से फाइल नहीं खुल रहा है ? मैं क्या करूँ
अगर आपके क्लिक करने के बाद सैंपल पेपर फाइल नहीं खुल रहा है तो आपके PDF खोलने वाले एप्प में लिंक काम नहीं करते हैं | अगर आपके मोबाइल में WPS ऑफिस है तो उसमें भी फाइल नहीं खुलेगा |
आप इसे गूगल ड्राइव में खोलिये |

Get all Subject Sample Papers
Click Below to Join our Whatsapp Channel
Join Whatsapp Channnal