

Pre-Board Examination : 2022-23

Class - X

Physics (Science Paper-I)

Time allowed : Two Hours

Maximum 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 A is compulsory. Attempt any four questions from Section B.

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

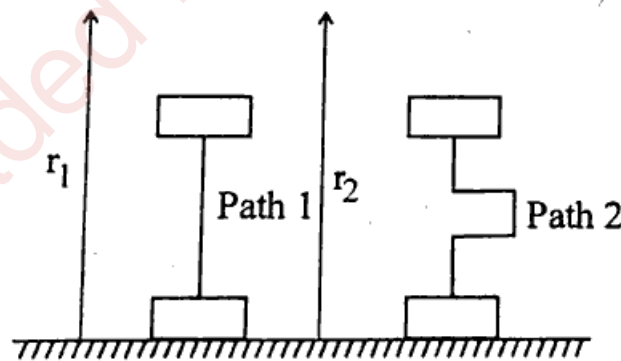
Section - (A)

(Attempt all questions from this Section.)

Question 1.

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

- (a) Which of the following is not a type of equilibrium ?
(i) Static (ii) Dynamic (iii) Neutral (iv) Rolling
- (b) S.I. unit of work is :
 (i) Joule (ii) Erg
(iii) Both (i) and (ii) (iv) None of these
- (c) If W_A is the work done in path 1 and W_B is the work done in path 2, then :

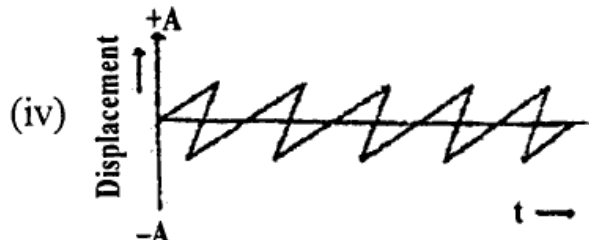
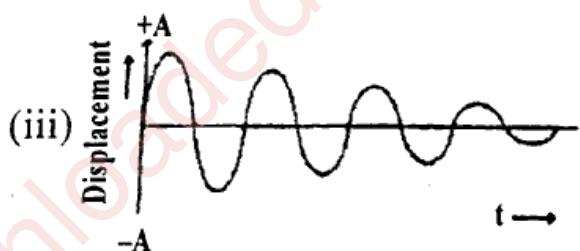
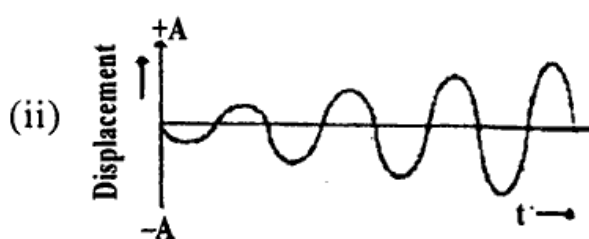


- (i) $W_A < W_B$
(iii) $W_A > W_B$

- (ii) $W_B = W_A$
(iv) All of these

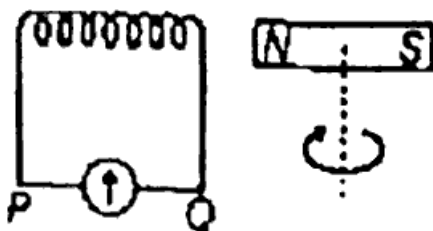
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- (d) Which of the following is an ohmic resistance ?
- (i) LED (ii) Junction Diode
 (iii) Filament of a bulb (iv) Nichrome wire
- (e) The correct descending order of the electromagnetic waves according to their wavelengths is :
- (i) UV-rays, γ -rays, microwaves, infrared rays
 (ii) Infrared rays, microwaves, UV-rays, γ -rays
 (iii) γ -rays, UV-rays, infrared rays, microwaves
 (iv) Microwaves, infrared rays, UV-rays, γ -rays
- (f) The phenomenon of light that causes the diamond to glitter is :
- (i) Refraction (ii) Total internal reflection
 (iii) Reflection (iv) Absorption
- (g) The frequency of a source is 20 kHz. The frequency of sound wave produced by it in water and air will be :
- (i) Same as that source (ii) > 20 kHz
 (iii) < 20 kHz (iv) Depend upon velocity
- (h) Which of the following wave represents a damped oscillation ?



- (i) Which of the following corresponds to Joule's law of heating ?
- (i) I^2R (ii) I^2Rt (iii) V^2Rt (iv) IR^2t
- (j) Rheostat is a :
- (i) Variable device (ii) Variable battery
 (iii) Variable resistor (iv) All of these

- (k) A bar magnet is rotated near a coil as shown below :

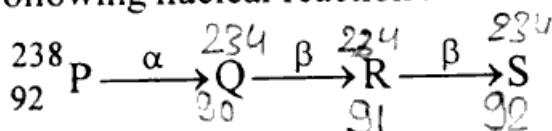


- Which of the following statements is correct for the given situation ?
- Induced current flows in only one direction.
 - Strength of induced emf increases as the rotation speed is decreased.
 - The strength of induced emf is affected due to coil resistance.
 - The direction of induced current changes alternatively.
- (l) Which of the following phenomena is not due to high specific heat of water ?
- Water is used as coolant
 - For fomentation hot Water bottles are used
 - Water is used in cold countries as a reservoir of wine and Juice bottles
 - None of the above
- (m) Lead is not used in calorimeter because :
- It has high specific heat
 - It is not metal
 - It is a toxic metal
 - It is not a solid metal
- (n) The energy conversion, when an oscillating pendulum moves from mean to extreme position is :
- Kinetic to potential
 - Potential to kinetic
 - Potential to kinetic to potential
 - Kinetic to potential to kinetic
- (o) The characteristics of sound which enables to differentiate between two sounds of different intensity is :
- Quality
 - Amplitude
 - Pitch
 - Loudness

Question 2.

- (a) Complete the following nuclear reaction :

[3]



Physics

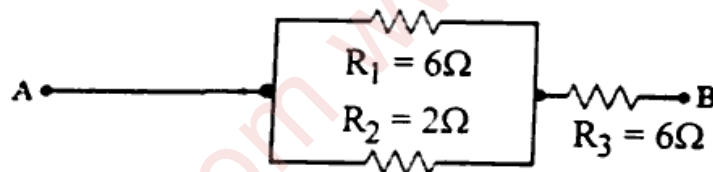
(4)

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- (b) Can the centre of gravity of a body be situated outside its material? Give an example. [2]
- (c) Define couple. State the S.I. unit of moment of couple. [2]
- (d) What is meant by an ideal machine? Write a relationship between the mechanical advantage (M.A.) and velocity ratio V.R. of an ideal machine. [2]
- (e) State the conditions when the work done by a force acting on a body is zero. [2]
- (f) When a body moves in a circular path, how much work is done by the body? Give reason. [2]
- (g) Why should a fuse with defined rating not be replaced by one with a larger rating? [2]

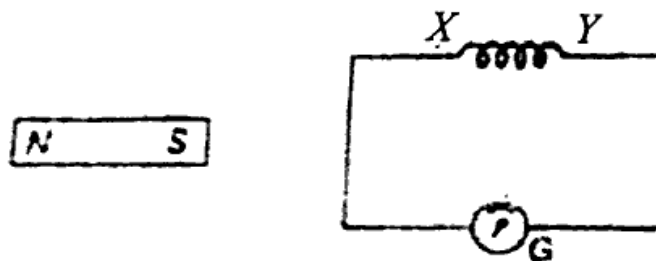
Question 3.

- (a) A lens forms an erect, magnified and virtual image of an object. Name the lens used and what is the position of the object? [2]
- (b) The given figure shows three resistors : $R_1 = 6 \text{ ohm}$, $R_2 = 2 \text{ ohm}$ and $R_3 = 6 \text{ ohm}$



Find the combined resistance. [2]

- (c) What do you mean by the term local earthing? Which part of the electrical appliance is earthed? [2]
- (d) The diagram below shows a coil connected to the centre zero galvanometer. [2]



What polarity is induced at point x, when :

- (i) the magnet is moved towards the coil and
- (ii) the magnet is moved away from the coil?

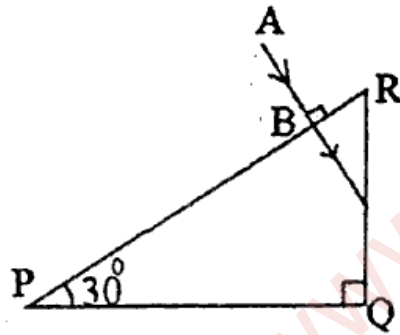
- (e) Suggest one effective process for the safe disposal of nuclear waste. [2]

Section – (B)

(Attempt any FOUR questions)

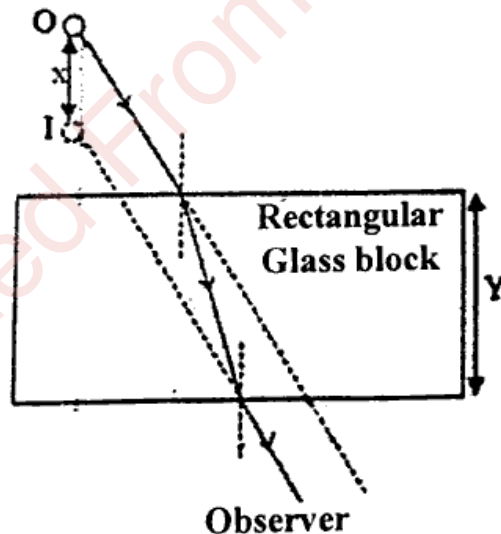
Question 4.

- (a) How do you tune your radio set in a particular station? Name the phenomenon involved in doing so and define it. [3]
- (b) Redraw and complete the path of the ray AB till it emerges out of the prism of critical angle 42° . [3]



(c)

[4]



The above diagram shows that an observer sees the image of an object O at I.

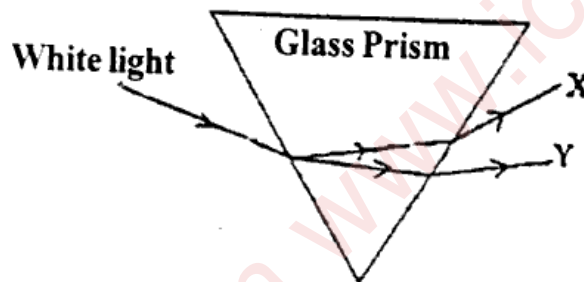
- (i) Name and define the phenomenon responsible for seeing the image at a different position.
- (ii) State the effect on X when :
- (1) Y increases (2) Y decreases

Question 4.

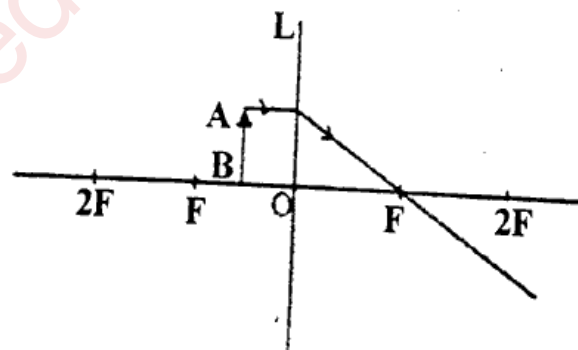
- (a) A truck and a car are running with the same speed on a highway. If the ratio of their kinetic energies is 25 : 12, then what is the ratio of their masses ? [3]
- (b) Draw a diagram of a pulley system of velocity ratio 4. Calculate its mechanical advantage if its efficiency is 90%. [3]
- (c) A uniform meter rule is balanced at 70 cm mark by suspending a weight of 50 gf at the 40 cm mark and 200 gf at the 95 cm mark. Draw a diagram of the arrangement and calculate the weight of the meter rule. [4]

Question 6.

- (a) A postage stamp kept below a rectangular glass slab of refractive index 1.5 when viewed from vertically above it, appears to be raised by 7 mm. Calculate the thickness of the glass slab. [3]
- (b) The diagram below shows the extreme colours of a visible spectrum (X and Y). [3]



- (i) Identify the colours X and Y.
- (ii) Which colour has greater speed in vacuum?
- (c) The diagram below shows an object AB kept in front of the lens. The path of one ray coming from the object is shown : [4]



- (i) Name the lens L.
- (ii) Redraw and complete the ray diagram showing the formation of the image.
- (iii) In which optical instrument is this kind of image formed ?

Question 7.

- (a) A person standing in front of a cliff fires a gun and hears its echo after 3s. If the speed of sound in air is 336 ms^{-1} . [3]
- (i) Calculate the distance of the person from the cliff.
- (ii) After moving a certain distance from the cliff he fires the gun again and this time the echo is heard 1.5 s later than the first. Calculate distance moved by the person.
- (b) A wire of resistance 9Ω having length 30 cm is tripled on itself. What is its new resistance? [3]
- (c) (i) Draw a labelled diagram of a Three pin socket. [4]
- (ii) Name the color code of the wire which is connected to :
- (1) Metallic body of an appliance
- (2) Switch for the appliance.

Question 8.

- (a) (i) What is meant by Radioactivity? [3]
- (ii) A radioactive substance is oxidised. What changes would you expect to take place in the nature of radioactivity? Explain your answer.
- (b) (i) Define the term specific latent heat of fusion of ice. [3]
- (ii) Which has more heat : 1 g of ice at 0°C or 1 g of water at 0°C ? Give reason.
- (c) Uranium nucleus ${}_{92}\text{U}^{238}$ undergoes several disintegrations and ultimately decays to lead nucleus ${}_{82}\text{Pb}^{206}$. How many alpha and beta particles are emitted? [4]

Question 9.

- (a) (i) Define the term heat capacity and state its S.I. unit. [3]
- (ii) What property of water makes it an effective coolant?
- (b) (i) At what (1) voltage and (2) frequency is the a.c. supplied to our houses? [3]
- (ii) What is the current rating of a Pole fuse?
- (c) The temperature of 600 g of cold water rises by 15°C when 300 g of hot water at 50°C is added to it. What was the initial temperature of the cold water? [4]