II-TERM EXAMINATION : 2022-23

CLASS - X (ICSE)

SCIENCE PAPER -1 (PHYSICS)

Time: 2 hrs. M.M.: 80

Note : i) **Answer to this paper must be written on the paper provided separately. You will not be allowed to write during first 15 minutes.**

ii) **This time is to be spent in reading the questions paper.**

iii) **The time given at the head of questions paper is the time allowed for writing the answer.**

iv) **Section-I is compulsory. Attempt any four from section-II.**

v) **The intended marks for questions or parts of questions are given in bracket [ ].**

SECTION–A [40 Marks]

(Attempt all questions from this section)

Q.1. Choose the correct answers to the questions from given options: [15]

i) N-S is the unit of which physical quantity : [1]

a) Change in velocity
b) Change in Energy
c) Change in momentum
d) None of the above

ii) While entering from medium A to medium B. if light slows down then: [1]

a) $\angle i = \angle r$
b) $\angle i > \angle r$
c) $\angle i < \angle r$
d) none of these

iii) A switch must be connected in the : [1]

a) Earth wire
b) Live wire
c) Neutral wire
d) Either earth or Neutral wire

iv) The ratio fo amplitude of two wave is 3 : 4 the ratio of their pitch : [1]

a) 1 : 1 b) 2 : 1
c) 3 : 4 d) 9 : 16

v) The centre of gravity of a hollow cone of height h is at a distance 'x' from its vertex where the value of x is : [1]

a) $h/3$ b) $2h/3$
c) $3h/4$ d) $5h/3$

vi) The most energetic electromagnetic radiation is : [1]

a) x-Rays
b) gamma Rays
c) U-V Rays
d) Micro waves

vii) A single fixed pulley is used as : [1]

a) Efficiency is 100 %
b) M.A. > 1
c) Multiplies effort
d) used to change the direction of effort in convenient direction

viii) Select the incorrect statements : [1]

a) A machine always has efficiency less than 100%
b) A machine have M.A. < V.R.
c) A machine can be used both as force multiplier and speed multiplier simultaneously
d) Among efficiency, V.R. and MA. of a machine, V.R. will not change at all for particular machine

ix) The work done by a fielder when he takes a catch in a Cricket Match is : [1]

a) Positive b) Negative
c) Zero d) both (a) and (c)

x) The electromagnetic radiations having wave length range from 1×10^{-8} m to 40×10^{-8} m is called as: [1]

a) Infrared rays
b) UV rays
c) Microwaves
d) Radio wave

xi) A pendulum is oscillating on either side of its mean position. The correct statement is : [1]

a) It has maximum kinetic energy at its extreme position
b) It has maximum potential energy at its mean position.
c) It has only kinetic energy
d) Mechanical energy remains constant throughout the motion.

xii) The unit of physical quantity $\frac{2K}{V^2}$ where K → Energy ; V → Velocity, will be [1]

a) $Kgms^{-1}$ b) ms^{-1}
c) Kg d) ms^{-2}

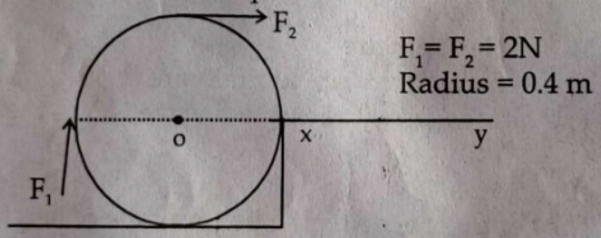
xiii) Correct relation between joule and erg : [1]

a) $1J=10^{7}$ erg
b) $1J=10^{-5}$ erg
c) $1J=10^{5}$ erg
d) $1J=10^{-7}$ erg

xiv) Which type of lens is used as a simple microscope : [1]

a) Convex lens
b) Concave lens
c) Both (a) and (b)
d) Plane transparent plate

xv) A heavy Roller is to be Raised on the plateform XY as shown in figure : [1]



Ratio of Torque, produced by F_1 and F_2:

a) 1 : 2
b) 2 : 1
c) 1 : 3
d) 3 : 1

Q.2. i) a) Name a material used for making standard Resistor [3]

b) A substance has zero Resistance below 1 Kelvin what is such a substance called ?

c) Name the law which relates the potential difference and current in a conductor.

ii) The power of lens is -5D. Find its focal length and type of the lens. [2]

iii) State the conditions for each of the following: [2]

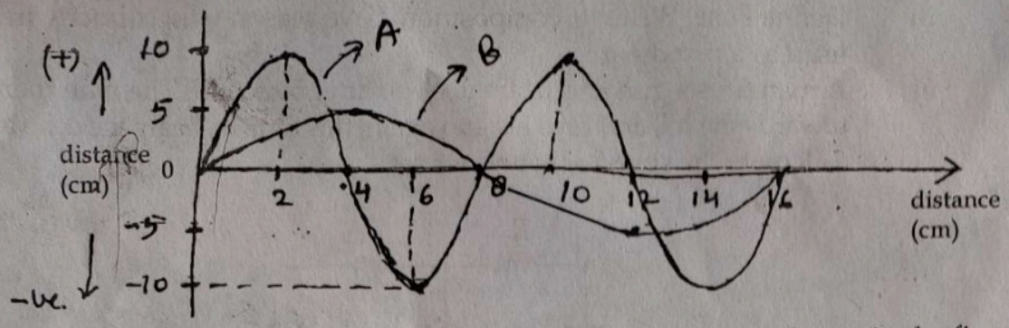
a) a lens has both its focal lengths equal
b) a ray passes undeviated through the lens.

iv) A uniform meter scale balances horizontally on a knife edge placed at 60 cm mark when a mass of 25 gram is suspended at 100 cm mark. Calculate the mass of scale. [2]

v) Two copper wires are of same length but one is thicker than other. [2]

a) which wire will have more resistance ?
b) which wire will have more specific resistance ?

vi)



During propagation of two waves A and B in a medium as shown in the figure. Compare the Ratio of : [2]

a) Amplitude

b) Wavelength

vii) What is the cause of refraction of a monochromatic light. Which property of light remains invariant during refraction phenomenon. [2]

Q.3. i) Two waves of the same pitch have amplitudes in the ratio 1 : 3, what will be the ratio of their : [2]

a) loudness

b) frequencies

ii) Between total internal Reflection and reflection from a plane mirror, which is better? Give two reasons in support. [2]

iii) The magnification by a lens is +0.5. Name the lens and state how are 'u' and 'v' related ? [2]

iv) How much work is needed to be done on a ball of mass 50 gm to give a momentum of 500 gm. cm sec^{-1} ? [2]

v) State two factors affecting internal resistance of a cell. [2]

SECTION-B

(Attempt any four questions)

Q.4. a) A coin kept inside water $\left(\mu = \frac{4}{3}\right)$ when viewed from air in a vertical direction, appears to be raised by 2.0 mm. Find the depth of coin in water. [3]

b) Why are stringed instruments like guitar provided with a hollow sound box ? [3]

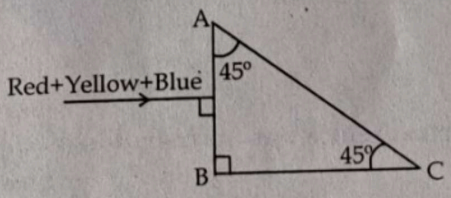
c) Two resistance of 2Ω and 1Ω, are connected in parallel with a current source of 3A . Draw an arrangement and deduce the current I_1 in R_1 and I_2 in R_2 . [4]

Q.5. a) The critical angle of diamond is 24°, what does it mean? How is critical angle related to refractive index. [3]

b) Show the bending of stick placed under water with the help of diagram. [3]

c) What is meant by Echo? State two conditions necessary for an Echo to be heard distinctly. [4]

Q.6. a) Complete the diagram if critical angle for yellow colour light is 45° [3]



b) An electric bulb is rated 250 V-60 W. What information does it convey? Also find the current through the bulb. [3]

c) i) Where should an objet be placed so that a real and inverted image of same size of the object is obtained using a convex lens? [4]

ii) Draw a ray diagram to show the formation of image as specified in part (i)

iii) Ramesh claims to have obtained an image thrice the size of object with the concave lens. Is he correct ? Justify your answer.

Q.7. a) The mechanical advantage of a machine is 5 and its efficiency is 80%. It is used to lift a load of 20 Kgf to a height 20 m. Calculate : [3]

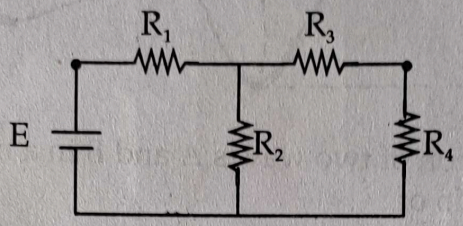
i) the effort required

ii) the work done on the machine ($g=10ms^{-2}$)

b) Define Fuse. Write its composition. Give reason why copper wire cannot be used as a fused wire. [3]

c) A man fires a gun and hears its echo after 5 second. The man then moves 310 m towards the hill and fires his gun again, this time he hears the echo after 3 second. Calculate the speed of sound waves. [4]

Q.8. a) [3]



In the given circuit, E=60V, R_1=18Ω, R_2=10Ω, R_3= 5Ω and R_4=10Ω :

i) Find the current through resistor R_1.

ii) Find p.d. across resistor R_2.

b) i) Name the phenomenon involved in tuning a radio set. [3]

ii) Define the phenomenon stated in part (i)

c) A ray of light incident at an angle 48° on a prism of refracting angle 60° suffers minimum deviation. Calculate the angle of minimum deviation
Write two factors affecting deviation. [4]

Q.9. a) Calculate the electrical energy in Kwh consumed by a 100 w bulb and a 60 w fan connected in parallel when used for 5 minutes. [3]

b) Give two characteristic of UV light and which prism is required for obtaining spectrum of U.V. light. [3]

c) Complete the following table : [4]

S.No.	Device	Material
i)	Connecting wires	_____
ii)	Electric toaster	_____
iii)	Fuse wire	_____
iv)	Heater	_____

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