

City International School

FIRST PRELIMINARY EXAMINATION 2015 – 2016

Date : 01/12/2015

Marks : 80

Std : X

Subject : Physics (Paper 1)

Time : 2 hrs

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.

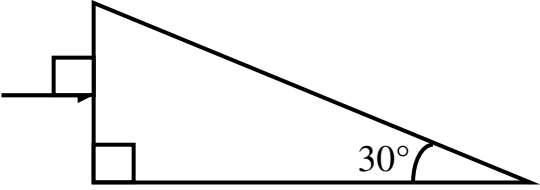
The time given at the head of this paper is the time allowed for writing the answers.

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 [40 MARKS]

All questions are compulsory.

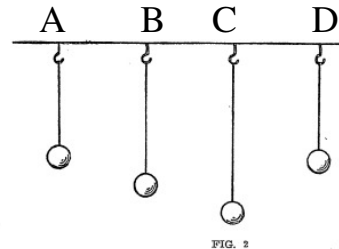
- Q. 1**
- a. State the factors affecting power spent by a source. (2)
 - b. A force of 10kgf is applied for 0.1s on a body of mass 100g initially at rest. Calculate the distance travelled by the body (Take $g = 10 \text{ N/kg}$) (2)
 - c. With respect to Nuclear energy. State: (2)
 - i. One limitation
 - ii. One advantage
 - d. Mark the position of F, L, E by drawing the nut cracker. (2)
What class of lever does it belong to?
 - e. State the conditions for no change in direction of light ray on refraction. (2)
- Q. 2**
- a. i. Write an equation to show relation between angle of incidence, angle of refraction and angle of the prism at the angle of minimum deviation. (2)
ii. How are the angle of incidence and angle of refraction related to each other at the angle of minimum deviation?
 - b. Complete the path of the ray: (2)

 - c. State the characteristics of the image when the object is placed at: (2)
 - i. size of image when object is at $2F$ in a convex lens.
 - ii. Position of image in a concave lens when object is at infinity.
 - d. Name the following. (2)
 - i. Source of infrared radiations.
 - ii. Method to detect ultraviolet radiation.

e. Why is red color used for the danger signal? (2)

Q. 3 a. i. Define kilowatt hour. (2)
ii. Write a relation between speed of sound, elasticity and density of a medium.

b. A, B, C, D are four pendulums suspended from the same support. The pendulum A is set into vibration. (2)

i. What is your observation?



ii. Give reason for your observation.

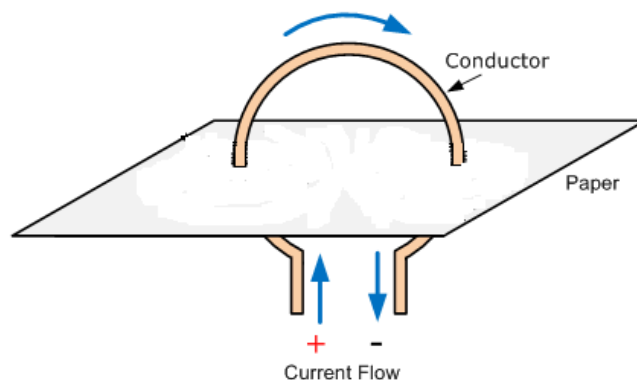
c. Name the material preferred for making resistance wires. Why is a such a material preferred? (2)

d. Three resistors of 2Ω , 3Ω , 4Ω are connected in parallel. Find the equivalent resistance. (2)

e. Name the factors affecting the heating effect of current. (2)

Q. 4 a. With the help of a neat labeled diagram show a socket. Mark L, E, N. (2)

b. (2)



i. Complete the diagram by showing the magnetic lines of force.

ii. Which rule helps to find the direction of magnetic field?

c. State the following. (2)

i. Function of a commutator.

ii. Transformation of energy in a d.c motor.

d. i. State a factor on which heat energy absorbed by a body depends on. (2)

ii. How much heat energy is required to melt 5 kg of ice?

(Specific latent heat of ice = 336 J/g).

e. Draw a neat labeled diagram of a cathode ray tube. (2)

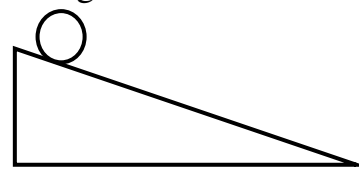
SECTION – B [40 MARKS]

Attempt any four questions from this section.

- Q. 5** a. i. Redraw the diagram and state the different forces acting on the rolling ball. (3)

ii. What kind of force exist between the two bodies.

iii. Define the above mentioned force.



- b. i. State the class of lever which has a mechanical advantage of more than 1. (3)

ii. Define gear.

iii. How can we change the direction of effort applied in a movable pulley?

- c. A ball of mass 30 g falls from a height of 10 m and after striking the ground, it rebounds from the ground to a height of 8m. Calculate (4)

i. initial potential energy of the ball

ii. the kinetic energy of the ball just before reaching the ground

iii. kinetic energy on striking the ground (take $g = 9.8 \text{ m/s}^2$. Neglect air friction)

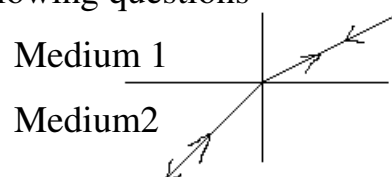
iv. loss in kinetic energy on striking the ground

- Q. 6** a. Observe the following diagram and answer the following questions (3)

i. What does the following diagram show?

ii. Define the refractive index.

iii. If ${}_a\mu_g = 2/3$. What will be ${}_g\mu_a$?



- b. A virtual and highly diminished image is obtained in a concave lens. (3)

i. State the position of the object.

ii. Draw a ray diagram to show the image formation.

- c. i. Define Dispersion. (4)

ii. State the cause of dispersion.

iii. Mention any two properties of electromagnetic waves.

- Q. 7** a. Strings of a guitar being plucked. (4)

i. State the kind of vibrations observed in the strings of a guitar.

ii. Why are the stringed instruments provided with a sound box?

iii. What does the amplitude of vibration depend on?

- b. Why is a loud sound heard during acoustic resonance? (3)

- c. A man stands in front of a vertical cliff and fires a gun. He hears an echo after 2.5 s. On moving 80 m closer to the cliff he again fires the gun and hears an echo after 2 s. Calculate (3)
- distance of man from cliff to his initial position.
 - Speed of sound

- Q. 8** a. i. Write a relation between specific resistivity and its factors. (3)
- Name a safety device for limiting the current in an electric circuit.
 - State one characteristic of a high tension wire.

- b. An electrical appliance is rated 1500 W, 250 V. This appliance is connected to 250 V mains. Calculate (3)
- the current drawn
 - the electrical energy consumed in 60 hours
 - the cost of electrical energy consumed at the rate of Rs. 4.50 per kWh

- c. State the safety precautions to be followed while using electricity. (2)

- d. Why is the top pin of a plug thicker and longer than the other two? (2)

- Q. 9** a. A metal piece of mass 20 g is heated to a constant temperature of 100°C . Then it is dropped in a calorimeter of mass 50 g and specific heat capacity 0.42 J/g K , containing 50 g of water at 20°C . After stirring the water, the highest temperature recorded is 22°C . Calculate the specific heat capacity of the metal. Specific heat capacity of water = 4.2 J/g K . (3)

- b. i. Define global warming. (3)
- Name and explain any one effect of global warming.
 - What is carbon tax?

- c. Why is the climate near the sea shore moderate?

- Q. 10** a. With respect to a a.c. generator (4)
- State the principle.
 - Function of slip rings.
 - State any two ways of increasing the speed of rotation of the coil.

- b. i. How is the filament heated in an electron gun of a cathode ray tube? (3)
- Name the material used the screen.
 - What happened on varying the negative potential on the grid?

- c. With respect to $^{12}\text{C}_6$ and $^{13}\text{C}_6$. Answer the following questions (3)
- What do the following elements show?
 - State its kinds.
 - What happens when an element is bombarded with an alpha particle?