

GREENLAWNS HIGH SCHOOL  
FINAL EXAMINATION 2016-17

SUB: PHYSICS  
TIME: 2 HOURS

STD: IX  
MARKS: 80

**NOTE** : Answers to this paper must be written on the paper provided separately. You will not be allowed to write during the first 10 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 4 complete questions from section II. The intended marks for questions are given in the brackets. [ ]

Values to be used in numericals:  $g = 9.8 \text{ ms}^{-2}$ . Speed of sound in dry air at  $0^\circ\text{C} = 330 \text{ ms}^{-1}$ , speed of sound in air =  $340 \text{ ms}^{-1}$ . Speed of sound in water =  $1400 \text{ ms}^{-1}$

**SECTION – I (40 Marks)**

**All questions in this Section are compulsory**

Q.1 A) Name the following: [5]

1. The central point of the aperture of a spherical mirror.
2. The position of the object in case of which the image obtained using a concave mirror is at focus.
3. The direction in which particles of the material medium vibrating about their mean positions vibrate while propagating in the form of transverse waves.
4. The word used for the object which travels with a speed greater than  $330\text{ms}^{-1}$  in air.
5. A physical quantity measured in terms of work done in transferring the charge from one conductor to the other conductor through a metallic wire.

B) Give any 3 uses of a magnetic compass [3]

C) State the law which gives the relation between the potential difference, resistance & the current flowing in a conductor. [2]

Q.2. A) Draw the symbol of each of the following. Also give its one use [6]

- 1) A plug key in function
- 2) A.C. source
- 3) Ammeter

B) State whether the following statements are true or false. If false correct the statements. [4]

1. In static electricity the positive charge is due to gain of proton.
2. In transverse waves at the position of compression the velocity of particle of medium is positive & maximum while at rarefaction the velocity of particle of medium is negative & maximum
3. A compass needle placed at neutral point remains unaffected.
4. Induction precedes repulsion.

Q.3. A) An electrician working with naked wires (uninsulated wires) is wearing leather gloves. Will he get a shock? Justify your answer. [2]

B) Calculate the frequency of sound in water if its wavelength is 2000 cm. [2]

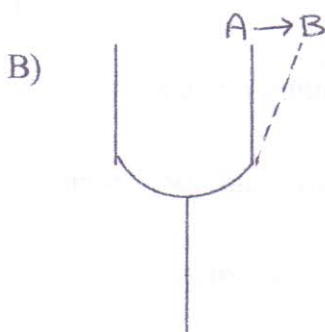
C) How many electrons flow through a cross section of a conductor when a current of 2.5 A flows through it? [2]

D) What do you mean by sparking? [2]

E) What happens to the particles of a medium & the energy in wave motion. [2]

Q.4.

A) The distance between the centre of curvature & a point on aperture of a concave mirror is 25.8 cm, then find the distance between the pole & focus of the mirror. [2]

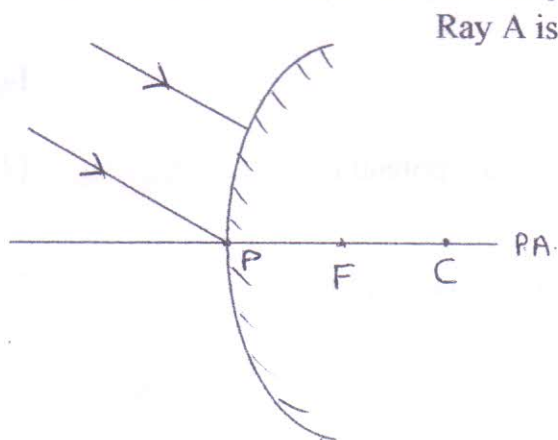


The diagram shows a vibrating tuning fork. [3]

It takes  $\frac{1}{156}$ th of a second to move from A to B

- Find
- i) Time period of the wave
  - ii) Frequency of the wave
  - iii) Is the wave audible to us?

C) Complete the ray diagram given below to show the formation of image. Also state the nature & the size of the image formed. [4]



Ray A is directed towards the centre of curvature 'C'.

D) If  $V_1$ ,  $V_2$ ,  $V_3$  represent the speed of sound in a gas, solid & liquid medium respectively, then which of the following is true? [1]

i)  $V_1 > V_2 > V_3$

ii)  $V_3 > V_2 > V_1$

iii)  $V_2 > V_3 > V_1$

iv)  $V_1 > V_3 > V_2$

**SECTION II – (40 Marks)**

**Attempt any four complete questions from this section.**

Q.5.

A) Give scientific reasons. [5]

- 1) Electrostatic induction readily occurs in a conductor.
- 2) Broken pieces of a magnet can be reused as magnets (give 2 points)
- 3) Secondary cells are preferred over primary cells. (give 2 points)

B) Distinguish between the following pairs on the basis of what is given in the brackets. [5]

- 1) Rheostat & Resistance box (Name of an alloy used for a resistance wire)
- 2) Static electricity & Current electricity (cause)
- 3) Longitudinal waves & Transverse waves (medium of propagation)
- 4) Concave Mirror & Convex mirror ( position of the focus)
- 5) If 'V' is the speed of sound & 'W' is the speed of wind, then the expression for speed of sound when the wind blows in the direction of sound and the speed of sound when the wind blows in opposite direction of sound.

Q.6 A) State the law which governs when two specific bodies are rubbed together to produce a static electricity. [2]

B) Calculate the speed of sound at  $35^\circ\text{C}$  in dry, still air. From your answer write how does the temperature affect speed of sound in air? [3]

C) Write the type of Mirror you will prefer in following cases. Give reason to your answer. [4]

- i) As a reflector in search light
- ii) as a reflector in street lamp

D) Suggest the best & the safest place for a person who is caught out of doors in a thunder storm. [1]

- Q.7. A) How does Aarush's reading of resistance of a conductor get affected when-[2]  
i) he uses a thicker wire but of the same material & same length as earlier.  
ii) he uses the same wire but after heating

B) What makes ultra sound very useful to human beings? Give its any 2 uses [4]

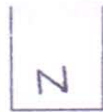
C) Draw a neat labelled ray diagram to obtain an image of an object beyond the centre of curvature using a converging mirror. Also write the nature & size of the image obtained in the figure drawn by you. [4]

Q.8. A) Define [5]

1. SI unit of resistance
2. Frequency of a wave
3. Current
4. Electroscope
5. Induced magnetism

B) Draw a neat labelled diagram of a gold leaf electroscope. [3]

C) What kind of magnetic field lines are obtained when a North pole of a bar magnet is kept in front of a North pole of the other bar magnet as shown in the figure given below. Copy the diagram in your answer booklet & complete it by drawing its magnetic field lines. [2]



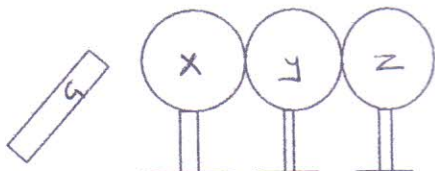
Q.9. A) A current of 1500 mA flows through a conductor for 0.2 s. Calculate the amount of charge passing through the conductor. [2]

B) In which medium the speed of sound is greater, humid air or dry air? Why? [2]

C) Sujal is measuring a weak current. Suggest two suitable units for her measurement. [2]

D) Give importance of the following - [2]  
 a) Lightning conductor  
 b) Galvanometer

E) Three identical metal spheres x, y, z are supported on separate insulated stands & placed in contact as shown in the figure. A glass rod 'G' is rubbed with silk & it is kept near the sphere X. [2]



- i) What change will there be on x, y, z?
- ii) The sphere 'Z' is earthed momentarily & then the glass rod is removed. What change will there be on each sphere?

Q.10. A) Give 2 factors which do not affect the speed of sound in a gas. [2]

B) State each of the following physical quantity given below is a scalar or a vector? [2]  
 i) current ii) potential difference

C) Write your observations in the following cases: [2]

- 1) The disc of negatively charged gold leaf electroscope is touched with an ebonite rod rubbed on fur cloth.
- 2) A glass rod rubbed on silk cloth is brought near the disc of a negatively charged gold leaf electroscope.

D) Complete the table given below with respect to a diverging mirror. Write your answers as i --- , ii --- & so on. [4]

Position of the object	Position of the image	Size of the image	Nature of the image
i) At any point in front of the mirror	Between the pole & focus	<u>  i  </u>	<u>  ii  </u>
ii) At infinity	<u>  iii  </u>	<u>  iv  </u>	Virtual & upright