GREENLAWNS HIGH SCHOOL

PHYSICS FINAL EXAMINATION 2024-25

STD.9 **TIME: 2 HR.**

DATE: 13/02/2025 **MARKS: 80**

NOTE:

1] Answer to this paper must be written on the paper provided separately.

2] You will not be allowed to write during the first 10 minutes. This time is to be spent in reading the paper.

3] The time given at the head of this paper is the time allowed for writing the answers. This paper has 3 pages (6 sides).

4] Section A is compulsory. Attempt any 4 questions from Section B.

5] The intended marks for a question or parts of questions are given in the brackets [ ].

SECTION A [40 MARKS]
ALL QUESTIONS IN THIS SECTION ARE COMPULSORY.

QUESTION 1

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

i) A substance which expands on cooling in a particular range of temperature is

a) Silver iodide b) Sodium carbonate

c) Magnesium chloride d) Potassium hydroxide

ii) As the current in the circuit increases, the resistance of a conductor

a) increases b) decreases

c) remains unchanged d) resistance is independent of current

iii) The cathode of a cell is always at

a) higher potential b) lower potential

c) zero potential d) same potential as that of an anode.

iv) The ice point on a particular temperature scale is

a) 212^0 F b) – 273 K c) -32^0 F d) 273 K

v) The longitudinal waves can be produced in

a) solids, liquids and gases b) solids and liquids

c) liquids and gases d) solids and on the surface of the liquids

vi) The SI unit of a physical quantity which tells us the thermal state of a body

Contd….

a) joule b) kelvin c) kilocalorie d) degree Celsius

vii) The strength of an electromagnet can be decreased by
a) reversing the direction of the current b) increasing the number of turns
c) using an alternating current d) decreasing the current in the coil

viii) The sound which has a speed of around 330 ms^{-1} in air is
a) sonic sound b) infrasonic sound c) ultrasonic sound
d) sonic sound, infrasonic sound as well as ultrasonic sound

ix) An example of good conductor of electricity is
a) asbestos b) pure water c) impure water d) China clay

x) The wrong rule of sign convention is
1- All distances are measured from the pole of the mirror taken as origin
2- The distances measured along the principal axis in the direction of incident light, are taken negative while those opposite to the incident ray are positive.
3- The distances above the principal axis are taken positive and those below the principal axis are taken negative.
a) 1 b) 2 c) 3 d) 2 and 3

xi) The lighting device which saves 67% energy and lasts 6 to 10 times longer than incandescent light is
a) LED b) CFL c) Electric bulb d) Fluorescent light

xii) The sum of all magnetic fields adds up to zero at
a) North pole b) South pole c) Neutral points d) Magnetic equator

xiii) The energy conversion in a cell, when it sends current in a circuit is
a) electrical to mechanical b) heat to chemical
c) chemical to electrical d) electrical to chemical

xiv) The food chain ends with
a) respiration b) photosynthesis c) excretion d) decomposition

xv) The temperature of a body depends on the average
a) kinetic energy b) potential energy c) atomic energy d) chemical energy

QUESTION 2

A] How is the position of the image related to the position of the object? [2]
(Give 2 points.)

B] How does the speed of sound in a gas change with change in [2]
i) amplitude of a sound wave ii) density of the medium

C] Define circuit. When does the current flow through the circuit? [2]

D] How is the working of an electric bell affected, if an alternating current is used instead of a direct current? Justify your answer. [2]

E] Which type of a spherical mirror is used in each of the following cases: [2]

i) As a doctor's head mirror ii) as a reflector in head light of an automobile

F] Why is the use of wood as a fuel is not advisable even though it is a renewable source of energy? [2]

G] Name the three types of thermal expansion. [3]

QUESTION 3

A] Give two smaller units of time. Also give their relation with the SI unit of time. [2]

B] A hollow glass sphere which floats with its entire volume submerged in water at 4^0C, sinks when water is heated above 4^0C. [2]

C] Draw a neat labelled diagram to show reflection of a ray of light normally incident on a plane mirror. Write the values of the angle of incidence and the angle of reflection. [2]

D] The sound of an explosion on the surface of a lake is heard by a boat man 100 m away and by a diver 100 m below the point of explosion. Who would hear the sound first, the boat man or a diver? Why? [2]

E] The current and the potential difference recorded for a resistance wire X connected in the circuit are as given below. Study the table and write whether the resistance wire X obeys Ohm's law or not. Justify your answer. [2]

Sr. No.	Current in ampere	Potential difference in volt
1	0.2	8
2	0.4	10
3	0.6	12
4	1.0	14

SECTION B (40 MARKS)
ATTEMPT ANY 4 COMPLETE QUESTIONS FROM THIS SECTION

QUESTION 4

A] Oceanic waves of time period 15s have wave velocity 25 ms^{-1}. Find: [3]

i) the wavelength of these waves ii) the horizontal distance between a wave crest and its adjoining wave trough.

B] Draw a neat labelled diagram using a suitable spherical mirror to get a virtual, upright and magnified image of an object kept in front of it. [3]

Contd….

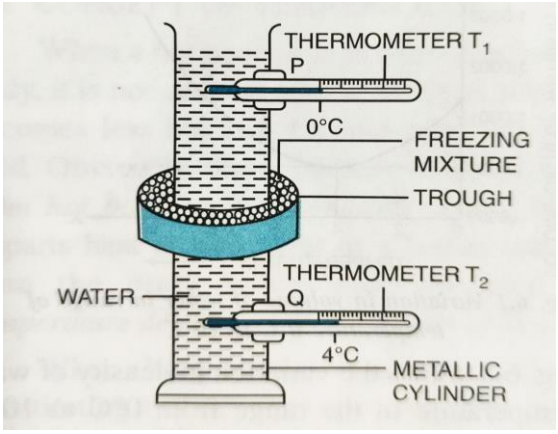
C] Define: [4]
i) Potential difference ii) Induced magnetism iii) Lateral inversion
iv) Greenhouse effect

QUESTION 5

A] Distinguish between the primary cell and the secondary cell on the basis of: [3]
i) internal resistance ii) durability iii) energy conversion

B] Draw the symbols of the following: [3]
i) Fixed resistance ii) Battery iii) Open tapping key

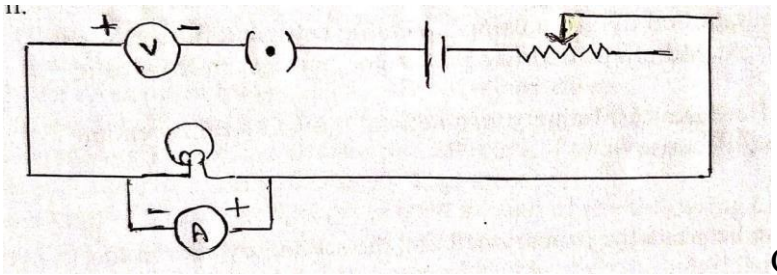
C] Observe the figure given below and answer the questions that follow: [4]



i) Name the figure.
ii) Which phenomenon does the figure demonstrate?
iii) Write down the final temperatures recorded by the thermometers T_1 and T_2
iv) Give one consequence of the phenomenon mentioned by you in Q.5 C- ii

QUESTION 6

A] Rectify the errors in the figure given below and redraw the correct circuit diagram. [3]



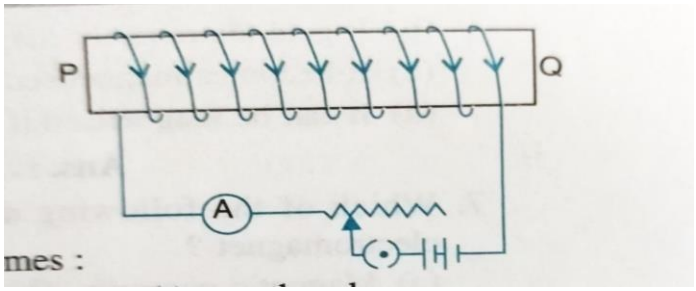
Contd….

B] Give one advantage and two limitations of using hydroenergy. [3]
C] In transferring 4C charge through a conductor 32J of work is done. If the current flowing through the conductor is 0.2 A, then calculate the obstruction offered to the flow of current by the conductor. [4]

QUESTION 7
A] Give one use each of the following: [3]
i) Ultrasound ii) Plane mirror iii) electromagnet
B] Draw a neat labelled diagram indicating the pattern of magnetic field lines near a bar magnet placed with its north pole pointing towards the geographic north. [3]

C] Fill in the blanks. [4]
i) 2.5m = _____nm
ii) 0.8 quintal = _____metric tonne
iii) 0.5 min = _____μs
iv) 0,38 mg = _____g

QUESTION 8
A] Observe the given figure of an electromagnet and answer the questions given below. [3]



i) Name the poles developed at P and Q ends of it.
ii) Give two advantages of an electromagnet over a permanent magnet.
B] Name the following. Do not give examples unless asked. [3]
i) The plane surface area of the mirror through which light rays enter and fall on the mirror.
ii) The increase in average effective temperature near the earth's surface due to an increase in the amount of green house gases in its atmosphere
iii) A natural source providing us energy continuously.

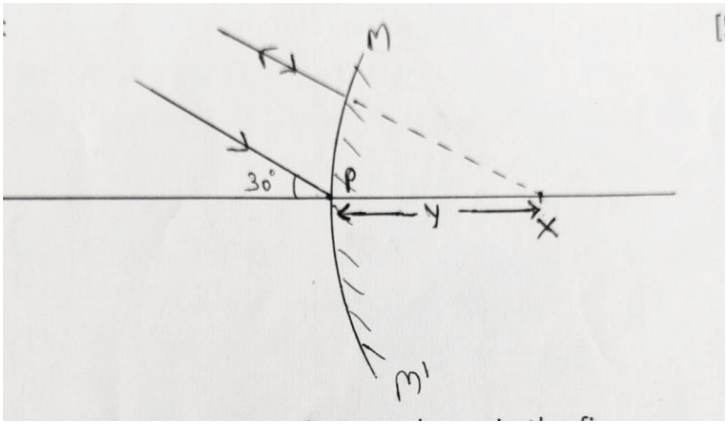
C] When an object is placed at a distance of 20 cm from a concave mirror, [4]
the size of the image is one fourth that of the object. Then calculate:
i) the distance of image from the mirror ii) focal length of the mirror.

QUESTION 9

A] Calculate the number of images of an object placed between two [3]
plane mirrors when they are inclined to each other at 45^0 in each of the following cases:
i) placed asymmetrically ii) placed symmetrically

B] Nane the electric component to be used for [3]
i) detecting the weak current in an electric circuit.
ii) obtaining the variable resistance.
iii) measuring the magnitude of the current flowing through the circuit

C] Observe the figure given below and answer the questions that follow: [4]



i) Name the point X and define it.
ii) What does the distance Y represent?
iii) If the distance Y is 42 cm , then at what distance will be the focus of the mirror?
iv) Copy the diagram in your answer booklet and complete it for the ray which is incident at point P.