

GREENLAWNS HIGH SCHOOL
PHYSICS PRELIMINARY EXAMINATION 2025-26

STD.10

TIME: 2 HR.

DATE: 8-01-2026

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 6 pages (11 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 QUESTIONSS IN THIS SECTION ARE COMPULSORY.

QUESTION 1

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

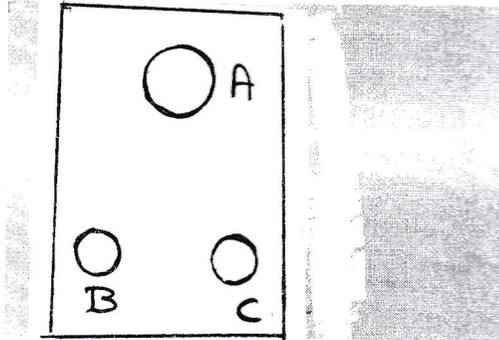
- i) If a block and tackle system with convenient direction has 3 movable pulleys, then its velocity ratio
 - a) is either 6 or 7
 - b) should be 6
 - c) should be 7
 - d) is 3

- ii) Assertion(A): The SI unit of heat capacity is $J^{\circ}C^{-1}$
Reason (R): Heat capacity is the amount of heat required to raise the temperature of the whole body by $1^{\circ}C$.
 - a) Both A and R are true and R is the correct explanation of A.
 - b) Both A and R are true and R is not the correct explanation of A.
 - c) A is true, R is false.
 - d) A is false, R is true.

- iii) The specific resistance of a conductor depends on its
 - a) length
 - b) material
 - c) area of cross section
 - d) radius

Contd.....

iv) Three wires with proper colour coding are connected to the three terminals of a three-pin plug socket. Match the colour of the wire with the proper terminals A, B and C of the socket.

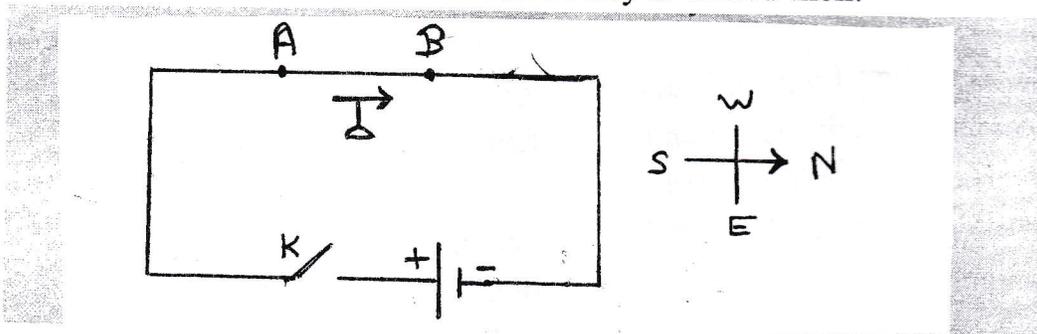


- a) A – Green, B – Light blue, C – Brown
- b) A – Light blue, B – Green, C – Brown
- c) A – Green, B – Brown, C – Light blue
- d) A – Light blue, B – Brown, C – Green

v) The refractive index of water with respect to air is $\frac{4}{3}$ and the refractive index of glass with respect to air is $\frac{3}{2}$. Then the refractive index of water with respect to glass is

- a) $\frac{9}{8}$ b) $\frac{8}{9}$ c) $\frac{3}{4}$ d) $\frac{1}{2}$

vi) A conductor AB is kept along north-south direction of the earth above a magnetic needle as shown below. When the key is closed then:



- a) the needle will not show any deflection. b) the needle will deflect towards east.
- c) the needle will deflect towards south. d) the needle will deflect towards west.

vii) Pick out the longest wavelength from the following types of radiations

- a) Blue light b) Gamma rays c) Ultraviolet rays d) Red light

viii) The correct option for Total internal reflection in a medium

- a) Can take place in an optically denser medium as compared to an optically rarer medium.
- b) This reflection does not obey the laws of reflection.
- c) Takes place for any angle of incidence greater than 42° .
- d) Can take place if the angle of incidence in a denser medium is less than the critical angle.

ix) Assertion(A): The magnitude of induced emf produced in a coil is equal to the total change of magnetic flux through the coil per unit time.

Reason (R): Lenz's law is in accordance to the law of conservation of energy.

- a) Both A and R are true and R is the correct explanation of A.
- b) Both A and R are true and R is not the correct explanation of A.
- c) A is true, R is false.
- d) A is false, R is true.

x) The linear magnification (m) produced by a concave lens is

- a) $m < 1$
- b) $m > 1$
- c) $m = 1$
- d) $m = 2$

xi) Identify the longitudinal waves from the following:

- a) light waves
- b) radio waves
- c) ultrasonic waves
- d) surface water waves

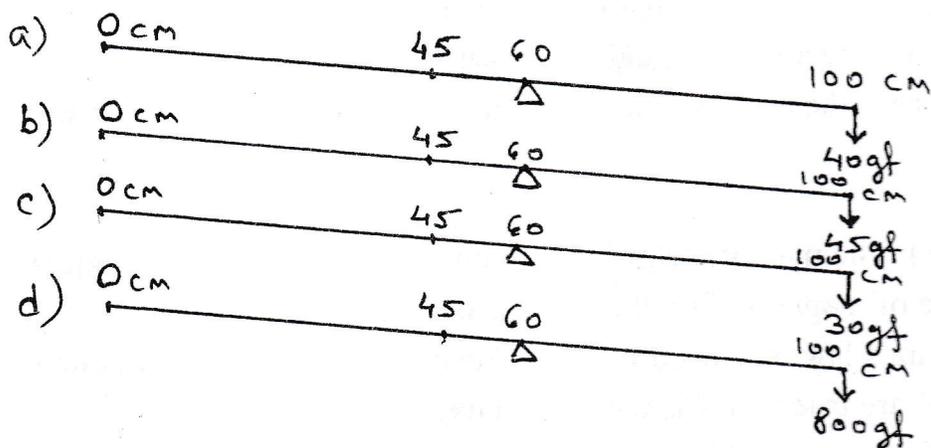
xii) An appliance rated 440W, 220V is connected across 220V supply, then the resistance of the appliance is

- a) 2Ω
- b) 0.009Ω
- c) 110Ω
- d) 55Ω

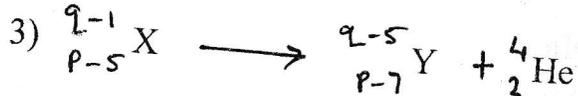
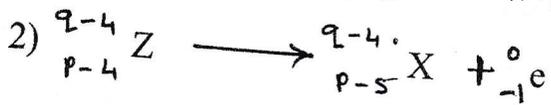
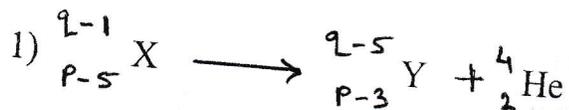
xiii) A key of a mechanical piano is struck gently and then struck again but much harder this time. In the second case

- a) Sound will be louder but pitch will not differ.
- b) Sound will be louder and pitch will be higher.
- c) Sound will be louder and pitch will be lower.
- d) Both loudness and pitch will remain unaffected.

xiv) If the centre of gravity of a metre scale of mass 80g lies at the 45cm mark, then which one of the following diagrams will show the balanced position of the scale?



xv) Which of the following equation/s is/are correctly balanced?



- a) Only 1st b) Only 3rd c) Both 1st and 2nd d) Both 3rd and 4th

QUESTION 2

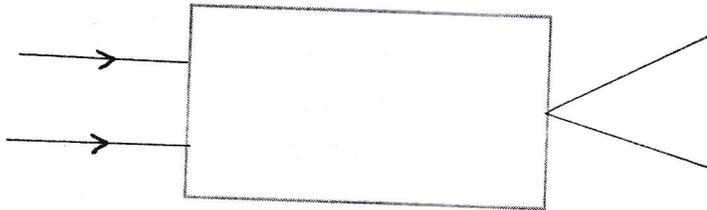
A] Is it possible to have an accelerated motion with a constant speed? When? [2]

B] State the energy changes in the following while in use: [2]
 i) Electroplating ii) Solar cooker

C] Why is it advised to pour cold water over burns caused on human body by hot solids? [2]

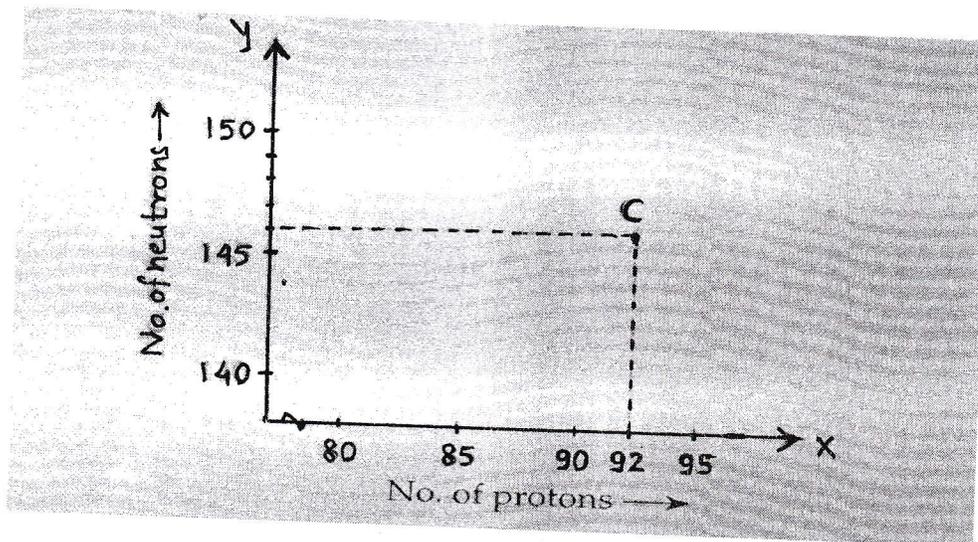
D] In a simple machine when a load moves faster than the effort, which one is greater- load or effort? Justify your answer. [2]

E] The box shown below has a lens kept inside. Copy the diagram in your answer booklet, draw the lens and complete the path of rays. [2]



F] A single movable pulley system of a load of 250kgf is lifted by an effort of 150kgf. Find the percentage of efficiency of system. [2]

G] The graph given below illustrates the correlation between the number of [3]
protons and the number of neutrons for an element C in the periodic table. The
element is denoted by an alphabet rather than its conventional symbol. When
element C depicted in the graph, undergoes radioactive decay, it releases
radioactive rays.



- a) Write the chemical symbol along with the mass number and atomic number for the element denoted as C.
- b) Copy the graph and plot the following on it:
 - i) The daughter element (D) after the emission of beta particle by the element C
 - ii) The daughter element (E), as indicated in answer of Q.2-G-b-i, if it undergoes an alpha decay.

QUESTION 3

A] In order to use a prism in binocular and camera without the loss of intensity, i) Which type of prism is used? ii) How much is the total deviation in order to turn the path of ray of light in order to get an image of an object? [2]

B] State two points of similarity between first order and a third order lever. [2]

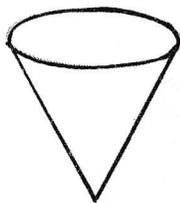
C] i) What is consumed using different electrical appliances, for which electricity bills are paid? [2]

ii) Name a device which is used to study the principle of mixtures.

D] i) How is the e.m.f. across primary and secondary coils of a transformer related with the number of turns of coil in them? [2]

ii) On which type of current do transformers work?

E] Nisha took an earthen pot which was filled with water up to its brim. The earthen pot was conical in shape and kept with its apex in downward direction. [2]



a) If the vertical height of the earthen pot is 12cm, where does its centre of gravity lie?

b) Nisha poured out all the water from the pot. How will its centre of gravity shift – towards the open end or towards its apex?

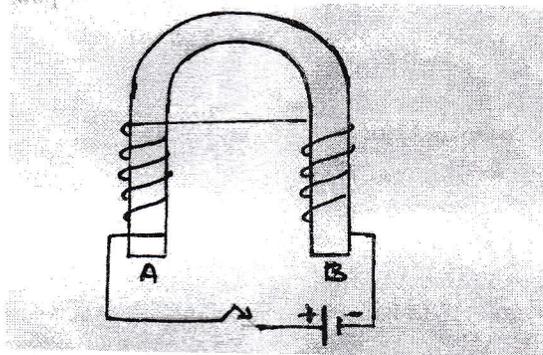
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SECTION B (40 MARKS)

ATTEMPT ANY 4 COMPLETE QUESTIONS FROM THIS SECTION

QUESTION 4

A] The diagram shows a coil wound around a U shaped soft iron bar AB. [3]



- What is the polarity induced at the ends A and B when the switch is pressed?
- Suggest one way to strengthen the magnetic field in the given electromagnet.
- What will be the polarities at A and B if the direction of current is reversed in the circuit?

B] How much steam at 100°C will just melt 3200g of ice at -10°C ? [3]
(Specific heat capacity of ice = $0.5 \text{ cal g}^{-1} \text{ }^{\circ}\text{C}^{-1}$, latent heat of steam = 540 cal g^{-1}
Specific heat capacity of water = $1 \text{ cal g}^{-1} \text{ }^{\circ}\text{C}^{-1}$, latent heat of ice = 80 cal g^{-1})

- C] i) Name the high energetic invisible electromagnetic waves which help [4]
in the study of the structure of crystal.
- State an additional use of the waves mentioned by you in Q.4-C-i.
 - Give two properties of the waves mentioned by you in Q.4-C-i.

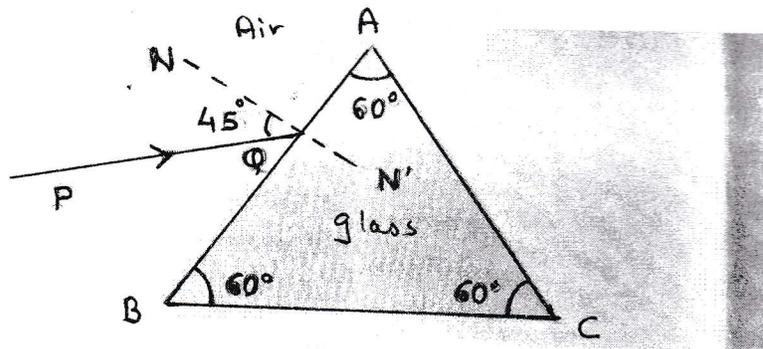
QUESTION 5

A] Name the material/s used for making following wires: [3]

- The heating element in an electric oven.
- The filament used in an electric bulb.
- Standard resistor wires.

- B] i) Define Power. [3]
 ii) What is the work done by a motor of power 60W operating with an efficiency of 75% in 2 min.?

C] A monochromatic ray of light is incident on an equilateral prism placed at minimum deviation position with an angle of incidence 45° as shown in the diagram. [4]



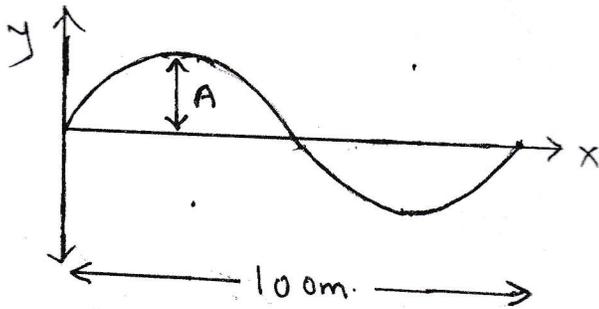
- Copy the diagram and complete the path of the ray PQ.
 a) State two factors on which the angle of deviation depends.

QUESTION 6

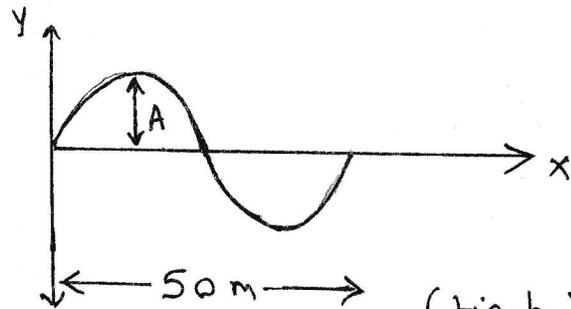
- A] A man standing 25m away from a wall produces a sound and receives the reflected sound. [3]
 i) Calculate the time after which he receives the reflected sound if the speed of sound in air is 350 ms^{-1} .
 ii) Will the man be able to hear distinct echo? Give reason for your answer.

- B] In a hydraulic power station, water is stored in a dam at a higher altitude and the turbine and generator are used. Using this information answer the following questions: [3]
 i) What is the purpose of water being stored at higher altitude?
 ii) Why is the turbine connected to the armature of a generator?
 iii) Name the basic law of Physics applicable in the working of hydraulic power plant.

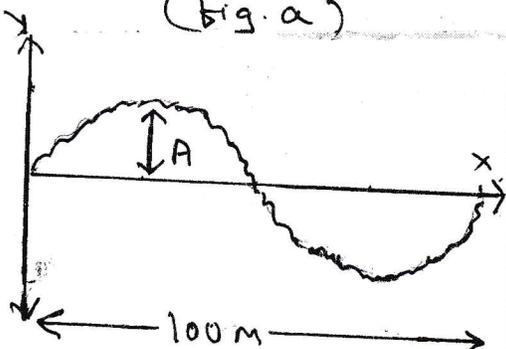
C] Analyse the figures given below and answer the questions that follow: [4]



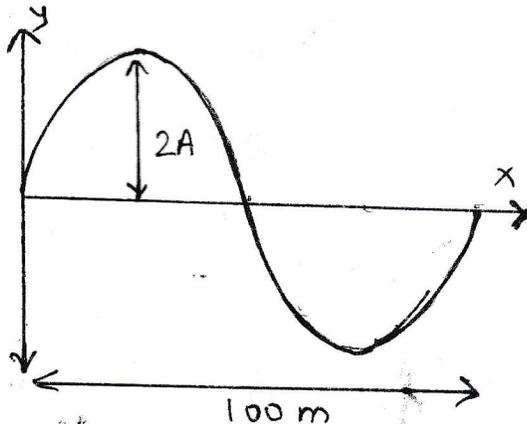
(fig. a)



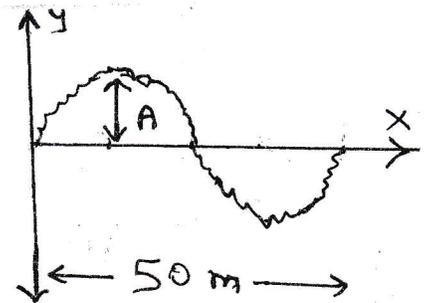
(fig. b)



(fig. c)



(fig. d)



(fig. e)

y Axis - Displacement
x axis - Distance.

- i) Find the two figures that show sound of same loudness but different quality.
- ii) Find the two figures that show sound of same pitch but different loudness.
- iii) Find the two figures that show sound of same loudness but different pitch.
- iv) Find the two figures that show sound of same loudness but different quality and different pitch.

QUESTION 7

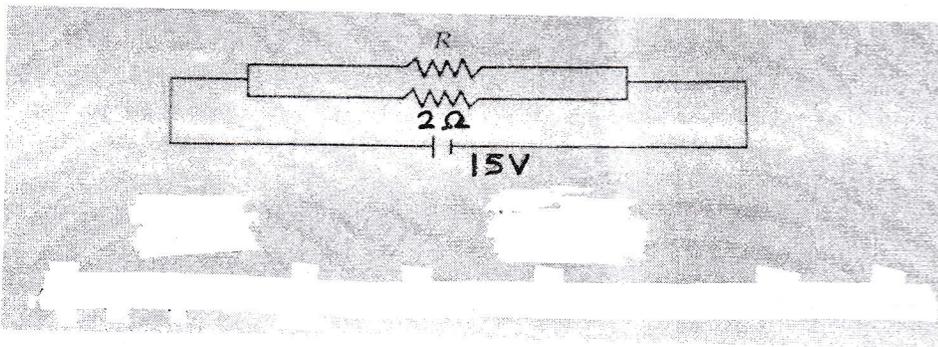
A] Draw a neat labelled diagram of block and tackle system satisfying the following conditions:

[3]

- i) Equal number of pulleys in both fixed and movable block.
- ii) M.A. = V.R. = 5

Also indicate the points of application as well as the directions of the load, effort and tension.

B] If in the given circuit, power dissipation is 150W, then calculate R. [3]

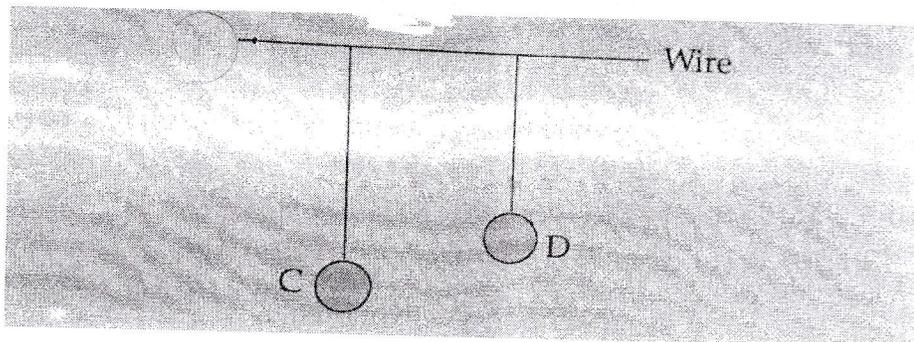


C] A needle placed 45cm from lens forms an image on the screen placed 90cm on the other side of the lens. [4]

i) Find the focal length of the lens. ii) What is the size of the image if the size of the needle is 5.0 cm?

QUESTION 8

A] Two pendulums C and D are suspended from a wire as shown in the figure given below. Pendulum C is made to oscillate by displacing it from its mean position. It is seen that D also starts oscillating. Observe the figure and answer the questions that follow: [3]



- Name the type of oscillation, C will execute.
- Name the type of oscillations, D will execute.
- If the length of D is made equal to C then what difference will you notice in the oscillations of D?

Contd.....

B] For each of the following scenarios, state whether the work done by gravity is positive, negative or zero. [3]

- a) a dog running on a levelled road
- b) a person climbing a tree.
- c) a car in neutral gear is coming down the slope.

C] A house uses 20 bulbs of 60W each for 8 hours per day, 10 fans that consume 0.6 A current for 10 hours per day, a refrigerator having resistance 100Ω for 24 hours per day. Calculate the electricity bill for a month of December if the rate of electricity is Rs 6 per kWh. Electricity supply is at 220 V. [4]

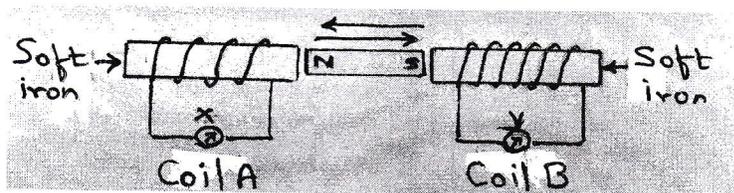
QUESTION 9

A] Distinguish between Nuclear fission and Nuclear fusion on the basis of the following points: [3]

- i) Temperature and pressure at which the reaction takes place.
- ii) Energy released for the same mass of substance taken for the reaction.
- iii) Availability of substance required for the reaction.

B] Draw a neat labelled diagram using a suitable lens which finds its application in a simple microscope. [3]

C] i) A magnet is kept at the centre of two coils A and B is moved to and fro as shown in the diagram. The two galvanometers show deflection. [2]



State with a reason whether:

$X < Y$ or $X > Y$ (X and Y are the magnitudes of deflection)

- ii) a) Define: Scattering of light. [2]
- b) Phenomenon - The smoke from the fire looks white.

Which of the following statements is true for the above phenomenon?

- i) Molecules of the smoke are bigger than the wavelength of light.
- ii) Molecules of the smoke are smaller than the wavelength of light.