

SSLC EXAMINATION, MARCH - 2025

PHYSICS

(English)

Total Score : 40

Time : 1½ Hours

Instructions :

- The first 15 minutes is cool-off time.
- You may use this time to read the questions and plan your answers.
- Answer only on the basis of instructions and questions given.
- Consider score and time while answering.

Score

SECTION - A

Answer any four questions. Each question carries 1 score.

1. The midpoint of a lens is called _____.
(Centre of curvature, Optic centre, Principal focus, Aperture)
2. If three images are formed when an object is placed between the reflecting surfaces of two plane mirrors, the angle between the mirrors will be _____.
(30°, 45°, 60°, 90°)
3. Which of the following statements **correctly** describes the working of a loudspeaker ?
 - (a) Sound energy is converted into electrical energy based on the motor principle.
 - (b) Electrical energy is converted into sound energy based on the motor principle.
 - (c) Electrical energy is converted into sound energy based on electromagnetic induction.
 - (d) Sound energy is converted into electrical energy based on electromagnetic induction.
4. Find the relation in the first pair and complete the second pair.
Magnification of the image formed by a mirror is less than +1 : Convex mirror.
Magnification of the image formed by a mirror is always +1 : _____.
5. In Right Hand Thumb Rule, the thumb indicates the direction of _____.

SECTION - B

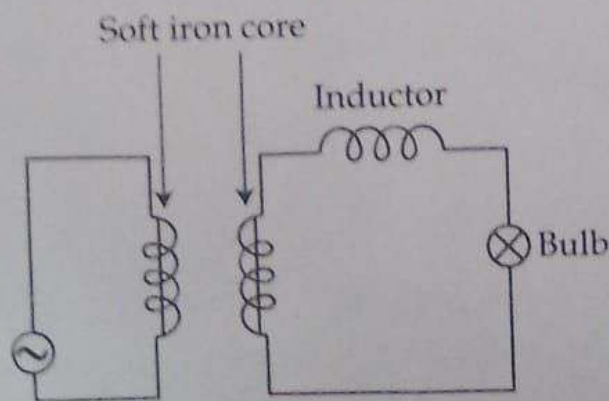
Answer any four questions. Each question carries 2 scores.

6. Nowadays discharge lamps are replaced by LED lamps for domestic lighting.
 - (a) How is electrical energy converted into light energy in discharge lamps?
 - (b) What are the advantages of LED lamps over discharge lamps?
7. What is transmission loss in an electrical power distribution system? What measures have been taken to minimise it?
8. (a) A ray of light entering from water to air at an angle of incidence 52° does not undergo refraction. Why?
 (b) Write a method that makes refraction possible here.
9. Power of lens is -0.5 D .
 - (a) What is the relation between the power of a lens and its focal length?
 - (b) Calculate the focal length of this lens.
10. The government is promoting the installation of solar panels by giving incentives to boost electricity generation. Explain its significance in the context of the energy crisis.

SECTION - C

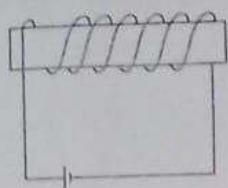
Answer any four questions. Each question carries 3 scores.

11. An electric heater has a resistance of $690\ \Omega$ and is designed to operate at 230 V .
 - (a) What are the characteristics of a good heating coil?
 - (b) Calculate the heat energy produced by this heater when it works for 30 minutes.
12. Observe the circuit below with two coils placed close to each other. When AC flows through it, the bulb glows.



- (a) Why does the bulb glow?
- (b) When a soft iron core is placed inside the inductor, what change will be observed in the intensity of brightness of the bulb. Justify your answer.

13. Observe the diagram of a current carrying solenoid.



- (a) Copy the figure and mark the direction of current flow through the coil. 1
(b) Identify and mark the north pole of this solenoid. Justify your answer. 2

14. Observe the following diagram regarding the image formation in the eye.

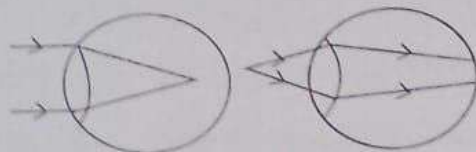


fig - 1

fig - 2

- (a) Identify the diagram that shows long-sightedness (hypermetropia). Justify your answer. 2
(b) How can this defect be corrected? 1

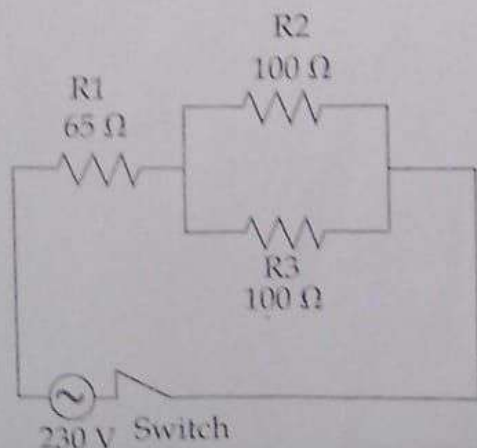
15. Fuels are substances that release plenty of heat energy on burning.

- (a) What are the drawbacks of partial combustion? 1
(b) Write the conditions favourable for the complete combustion of different fuels. 2

SECTION - D

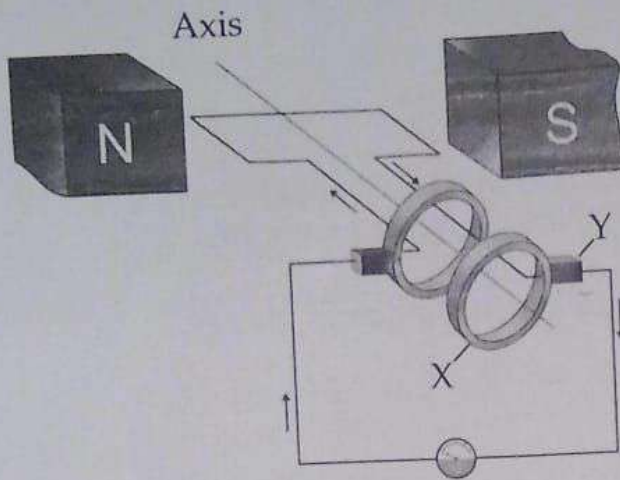
Answer any four questions. Each question carries 4 scores.

16. Analyse the circuit diagram given below and answer the questions.

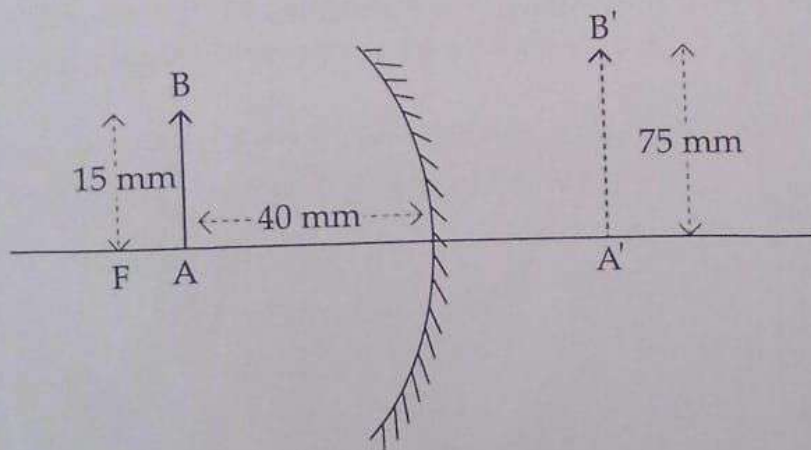


- (a) "Voltage across the $65\ \Omega$ resistor in the circuit is 230 V ". Do you agree with this statement? Explain. 1
(b) Calculate the effective resistance of the circuit. 2
(c) If the $100\ \Omega$ resistor (R_3) in the circuit is removed, will the effective resistance decrease? Why? 1

17. The schematic diagram of a generator is given below.

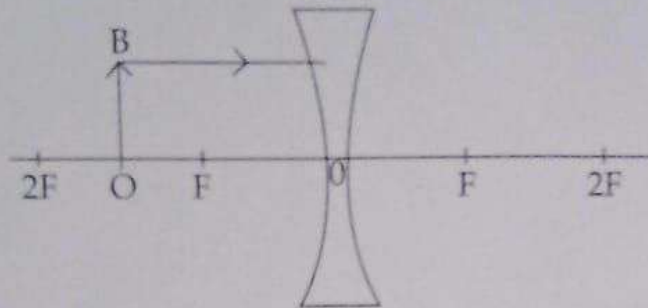


- Name the parts labelled as 'X' and 'Y'.
 - Which type of current is produced as output here? Draw the graph of output voltage.
 - State the law that helps to find the direction of current in the armature coil.
18. $A'B'$ is the image formed when an object AB is placed at a distance of 40 mm from a concave mirror as shown. Observe the diagram and write the answers to the questions.



- Write the height of the object and the object distance using New Cartesian sign convention.
- Calculate the magnification of the image.
- Find out the image distance and the focal length.

19. Ray diagram of an object placed on the principal axis of a concave lens is shown below.



- (a) Copy the diagram and complete it to show the image formation. 2
- (b) The image formed by a concave lens is always virtual. Why? 1
- (c) What are the characteristics of the image formed here? 1

20. The irregular and partial reflection of light is called scattering.

- (a) Write the factors that influence scattering. 1
- (b) Explain the reason for the red colour of the setting sun? 2
- (c) The sky always appears dark for an astronaut in space. Why? 1