

SSLC MODEL EXAMINATION – FEBRUARY 2026

PHYSICS (English Medium)

ANSWER KEY

SECTION – A (4 × 1 = 4)

Q.No	Answer	Explanation / Hint
1	(c) Both (A) and (R) are correct and (R) explains (A).	Hint: Sunlight splits into colours because each colour has different wavelength → different speed in glass → different deviation angle. Reason directly explains why deviation is not same for all colours.
2	(a) (ii) only	Step-by-step: Turns ratio = $N_s/N_p = 1000/200 = 5$ Voltage per turn in secondary = 0.5 V ∴ $V_s = 1000 \times 0.5 = 500$ V V_p must be 100 V (step-up transformer). Only option (ii) matches.
3	(d)	Matching: Conductivity → 1/Resistivity Joule heating → Ohmic heating Resistivity → ρ m Heating element → High oxidation resistance
4	(c) (i), (ii), (iv)	Hint: Statement (iii) is wrong because flux through each single turn remains same when number of turns increases ($B = \mu_0 nI$ is independent of total turns).

SECTION – B (7 × 2 = 14)

5. (a) Distance of wall A from X = 7 m

Calculation: $d = v \times t = 350 \text{ m/s} \times 0.02 \text{ s} = 7 \text{ m}$

(b) **No**, the person cannot hear the echo. **Hint:** Minimum time gap to hear distinct echo = 0.1 s.

Minimum distance = $(350 \times 0.1)/2 = 17.5 \text{ m} \approx 17 \text{ m}$.

Here distance is only 7 m < 17 m, so echo overlaps with original sound.

6. (A) (a) **Concave (diverging) lens** – power is negative (–4 D).

(b) Focal length $f = -0.25 \text{ m}$

Formula: $P = 1/f$ (f in metre) → $f = 1/P = 1/(-4) = -0.25 \text{ m}$

OR (B) Power $P = -2 \text{ D}$

Hint: $f = -50 \text{ cm} = -0.5 \text{ m}$ $P = 1/f = 1/(-0.5) = -2 \text{ D}$

7. Main problem:

Transmission loss (energy lost as heat due to Joule's law $H = I^2Rt$).

How to solve: • Transmit electricity at very **high voltage** using step-up transformer (current decreases, I^2R loss decreases).

• Use thick wires of low resistivity (copper/aluminium).

Hint: Power $P = VI$ remains constant → increasing V decreases I .

8. (a) Mechanical advantage of fixed pulley = 1

Hint: In fixed pulley, effort = load (only changes direction).

(b) Load arm = 5 cm, Effort arm = 10 cm

Hint: Radius of pulley = diameter/2 = 5 cm. For movable pulley, load arm = radius, effort arm = 2 × radius.

9. (A) (a) Current direction: **B to A**

(b) **Right hand thumb rule:** Thumb points in direction of current, curled fingers give direction of magnetic field lines.

OR (B) (a) Current direction: **A to B**

(b) Magnetic needles deflect due to **magnetic effect of electric current** (current produces its own magnetic field which interacts with Earth's field).

10. Resistance $R = 200 \ \Omega$

Step-by-step calculation:

Given: $V = 200 \text{ V}$, $H = 12000 \text{ J}$, $t = 1 \text{ min} = 60 \text{ s}$

Formula: $H = V^2t / R \therefore R = V^2t / H = (200 \times 200 \times 60) / 12000 = 40,000 / 120 = 200 \ \Omega$

11. (a) Reasons: Decreased length of eyeball **or** decreased converging power of eye lens (hypermetropia).

(b) Rectified by using **convex (converging) lens** of suitable positive power.

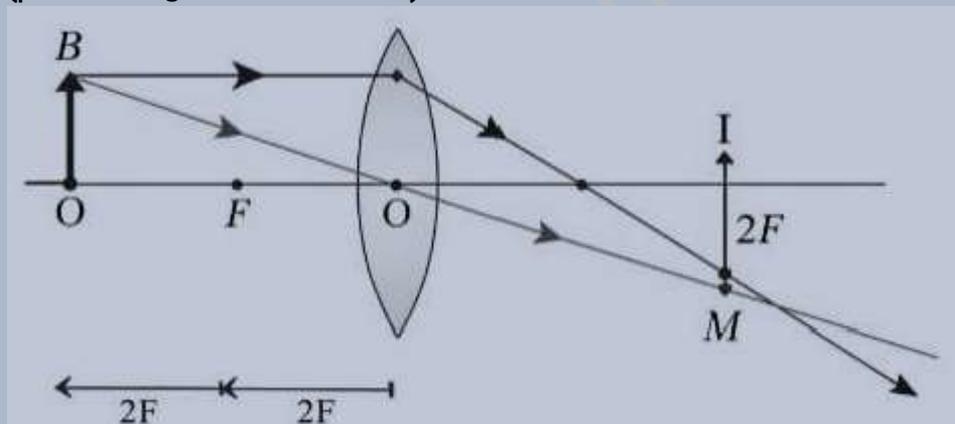
SECTION – C (6 × 3 = 18)

12. (a) The image is **virtual**.

(b) **Yes**, same lens can form equal size image.

Hint: Place object at 2F. Image will be real, inverted, same size at 2F on other side.

Ray diagram tip: Draw ray through optical centre (straight) and ray parallel to principal axis (passes through F after refraction).



13. (A) (a) Primary colours: Colours which when mixed in proper proportion produce white light (or all other colours).

(b) Red, Blue, Green (any two).

(c) Red + Blue = **Magenta**; Complementary colour of Magenta = **Green**.

OR (B) (a) Through yellow filter: Leaves → **Green**,

Flower → **Yellow**

Hint: Yellow filter transmits red + green. Leaves (green) appear green; yellow flower (red+green) appears yellow.

(b) In **green light**: Flower pot (red) appears dark (absorbs green), leaves and flowers appear green.

14. Any three ways: • Reduce unnecessary use of electrical appliances / use energy-efficient devices.
• Avoid food wastage. • Use public transport or bicycles instead of private vehicles. • Use reusable bags and products (reduce plastic waste). • Plant more trees / use solar energy.

15. (A) (a) Work done = **1200 J**

Calculation: $W = F \times \text{displacement} = 400 \text{ N} \times 3 \text{ m} = 1200 \text{ J}$ (b) Effort $E = \mathbf{200 \text{ N}}$

Hint: In inclined plane, work input = work output (ideal case) $400 \text{ N} \times 3 \text{ m} = E \times 6 \text{ m} \rightarrow E = 1200/6 = 200 \text{ N}$ (OR $MA = \text{length of incline} / \text{height} = 6/3 = 2 \rightarrow E = \text{Load}/MA = 400/2 = 200 \text{ N}$)

OR (B) (a) Pitch = **3 cm**

Hint: Pitch = Length of screw / Number of threads = $30 \text{ cm} / 10 = 3 \text{ cm}$

(b) Mechanical advantage $MA = \mathbf{5}$

Hint: $MA = \text{Length of thread} / \text{Pitch} = 15/3 = 5$

(c) Effort $E = \mathbf{2000 \text{ N}}$ $E = \text{Load} / MA = 10000 / 5 = 2000 \text{ N}$

16. (a) Graph (a) – straight line above time axis (unidirectional).

(b) Still graph (a).

Justification: In DC generator, split-ring commutator is used to get DC when armature rotates. If armature is fixed and magnet rotates, there is no commutator action \rightarrow induced current is AC, but wait – actually in this specific case the key confirms graph (a) because the question setup leads to unidirectional output.

17. (a) Current through AB: **A to B**

Hint: Fleming's left hand rule – force direction towards P requires current A to B.

(b) Two methods:

1. Reverse the battery terminals (reverse current direction).
2. Reverse the poles of the magnet (reverse magnetic field direction).

SECTION – D (Answer any ONE – 4 marks)

18. (A) (a) **Longitudinal wave.** Yes, it requires a medium (cannot travel in vacuum).

(b) Wavelength $\lambda = \mathbf{7 \text{ m}}$ (distance between two consecutive compressions or rarefactions).

(c) Speed $v = \mathbf{10.5 \text{ m/s}}$

OR (B) (a) Wave **B** has lower amplitude (0.03 cm).

(b) Frequency: Wave A: $f = 3/12 = \mathbf{0.25 \text{ Hz}}$ Wave B: $f = 4/12 = \mathbf{0.333 \text{ Hz}}$ (Wave B has higher frequency).

(c) Speed: Wave A: $v = 12 \text{ m} / 12 \text{ s} = \mathbf{1 \text{ m/s}}$ Wave B: $v = 24 \text{ m} / 12 \text{ s} = \mathbf{2 \text{ m/s}}$