SECOND TERM SUMMATIVE ASSESSMENT 2026-27

ANSWER KEY / SCORING INDICATORS

PHYSICS

Std: X SET 1 **Score: 40**

For teachers **Time: 1½ Hours**

Note to the teacher: Accept any correct alternative answer. Give the split scores shown in brackets.

Questions 1 to 4 **(1 score each)**

1. C. kilowatt hour (1)

2. A. Both A and R are correct and R is the correct explanation of A. (1)

3. B. (i) and (iii) (1)

4. A. a-(ii), b-(iii), c-(i) (1)

Questions 5 to 11 **(2 scores each)**

5. a) $\lambda = v / f = 340 / 170 = 2$ m (1)

b) The wavelength becomes half, i.e. 1 m ($v = f\lambda$; v is constant). (1)

6. a) Refraction with dispersion and (total internal) reflection inside the droplets. (1)

b) Behind the observer (the Sun must be at the observer's back). (1)

7. (A) a) Any two: increase the current; increase the number of turns; insert a soft iron core. (1)

b) Electromagnet (1)

(B) Hold the conductor in the right hand with the thumb pointing along the current. The curled fingers show the direction of the magnetic field (lines). Thumb – current; fingers – magnetic field. (2)

8. a) Low melting point (and suitable resistance). (1)

b) When excess current flows, the fuse wire melts and the whole circuit is broken, protecting the appliances. (1)

9. a) An LED converts most of the electrical energy into light and very little into heat, so it gives the same light at a lower power. (1)

b) Any one: switch off lights and fans when not needed; use star-rated appliances; make use of daylight; avoid keeping appliances on standby. (1)

10. a) The galvanometer needle deflects (momentarily). (1)

b) No deflection, because there is no change in the magnetic flux linked with the coil, so no emf is induced. (1)

11. (A) a) Fleming's Left-Hand Rule (1)

b) Forefinger – direction of the magnetic field; middle finger – direction of the current. (1)

(B) Any two: AC changes its direction periodically, DC flows in one direction only; AC can be stepped up or down using a transformer, DC cannot; AC is produced by AC generators, DC by cells/batteries/DC generators. (2)

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Questions 12 to 17 **(3 scores each)**

12. (A) a) u = −30 cm, f = +20 cm. $1/v - 1/u = 1/f \Rightarrow 1/v = 1/20 - 1/30 = 1/60$, so v = +60 cm (60 cm on the other side of the lens). (2)

b) Real, inverted and magnified (m = v/u = −2). (1)

(B) a) f = 1/P = 1/(−2) m = −0.5 m = −50 cm (1)

b) Concave lens (1)

c) Myopia (short-sightedness) (1)

13. a) Yellow (1)

b) It appears black. A red rose reflects only red light. Green light falling on it is absorbed and no light is reflected to our eyes. (2)

14. a) P – split ring commutator; Q – (carbon) brushes (1)

b) It reverses the direction of current in the coil after every half rotation, so the coil keeps rotating in the same direction. (1)

c) Any one: increase the current; increase the number of turns; use a stronger magnet. (1)

15. Electric iron: 1000 W × 1 h = 1 kWh; bulbs: 4 × 40 W × 5 h = 0.8 kWh; fans: 2 × 60 W × 8 h = 0.96 kWh (1)

Energy per day = 2.76 kWh; for 30 days = 2.76 × 30 = 82.8 units (1)

Cost = 82.8 × 6 = ₹ 496.80 (1)

16. a) $H = I^2Rt = 2^2 \times 50 \times (5 \times 60) = 4 \times 50 \times 300 = 60\,000$ J (2)

b) Four times ($H \propto I^2$) (1)

17. (A) a) $V_s = V_p \times N_s/N_p = 220 \times 1000/200 = 1100$ V (1)

b) Step-up transformer (1)

c) To reduce eddy currents and the loss of energy as heat in the core. (1)

(B) a) Electromagnetic induction (1)

b) Slip rings and brushes (1)

c) The current changes its direction 100 times (completes 50 cycles) in one second. (1)

Question 18 **(4 scores)**

18. (A) a) Motor principle (a current-carrying conductor in a magnetic field experiences a force). (1)

b) Electrical energy → mechanical energy (sound). (1)

c) The force on it changes direction with the current, so the voice coil (and the diaphragm) vibrates back and forth, producing sound. (1)

d) Microphone (moving coil microphone) (1)

(B) a) The needle deflects for a moment. (1)

b) No deflection; the current in the primary is steady, so the magnetic flux does not change. (1)

c) The needle keeps deflecting to both sides continuously (an alternating emf is induced continuously). (1)

d) Mutual induction (1)

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