SECOND TERM SUMMATIVE ASSESSMENT 2026-27

ANSWER KEY / SCORING INDICATORS

PHYSICS

Std: X SET 2 **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. B. AC generator (1)

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

3. A. (i) and (ii) (1)

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

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

5. a) Total distance travelled = 340 × 2 = 680 m; distance to cliff = 680/2 = 340 m (1)
b) About 17 m (sound must take at least 0.1 s to return: 340 × 0.1 / 2). (1)

6. a) Dispersion of light (1)
b) Violet; it has the shortest wavelength, travels slowest in glass and is refracted (bent) the most. (1)

7. (A) a) Almost straight and parallel (the field is nearly uniform at the centre). (1)
b) Any one: increase the current; increase the number of turns. (1)
(B) Any two: both have a north and a south pole; field lines go from N to S outside; field lines form closed loops; a freely suspended solenoid also sets in the N–S direction. (2)

8. a) The bulb consumes 60 J of electrical energy per second when connected to a 230 V supply. (1)
b) $I = P/V = 60/230 \approx 0.26$ A (1)

9. a) If the live wire touches the metal body, current flows to the earth through the earth wire, so the user does not get a shock (and the fuse/MCB trips). (1)
b) Green (or green with yellow stripes) (1)

10. a) Any two: speed of relative motion (rate of change of flux); number of turns of the coil; strength of the magnet. (1)
b) Galvanometer (1)

11. (A) a) The force reverses (opposite direction). (1)
b) The force remains in the same direction. (1)
(B) At high voltage the current is low, so the heat loss (I^2R) in the lines is reduced; thinner wires can be used, reducing cost. (2)

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

12. (A) a) f = −15 cm, u = −30 cm; 1/v = 1/f + 1/u = −1/15 − 1/30 = −3/30, so v = −10 cm (10 cm in front of the lens, on the same side as the object). (2)

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b) m = v/u = (−10)/(−30) = +1/3 (virtual, erect and diminished). (1)
(B) a) Hypermetropia (long-sightedness) (1)
b) Convex lens (1)
c) Any one: the eyeball becomes too short; the focal length of the eye lens becomes too long (lens less converging). (1)

13. a) White (1)
b) Two colours of light that together give white light are called complementary colours. (1)
c) White paper reflects all the colours of sunlight equally. (1)

14. a) X – North pole; Y – South pole (1)
b) Clock-face rule / Right-Hand Thumb (grip) Rule (1)
c) Any one: electromagnet in cranes, electric bell, relays, MRI, etc. (1)

15. a) I = P/V = 1100/220 = 5 A (1)
b) R = V/I = 220/5 = 44 Ω (1)
c) E = 1.1 kW × 2 h = 2.2 kWh = 2.2 units (1)

16. a) Total R = 30 Ω; I = V/R = 30/30 = 1 A (1)
b) 10 Ω: H = I^2Rt = 1 × 10 × 10 = 100 J; 20 Ω: H = 1 × 20 × 10 = 200 J (1)
c) The 20 Ω resistor; the same current flows through both, and heat produced is proportional to resistance. (1)

17. (A) a) $N_s = N_p \times V_s/V_p$ = 1000 × 23/230 = 100 turns (1)
b) $V_pI_p = V_sI_s \Rightarrow I_p$ = 23 × 2 / 230 = 0.2 A (1)
c) Any one: distribution transformer near houses; mobile phone charger; adaptors; etc. (1)
(B) a) To reduce the current and hence the heat loss during transmission. (1)
b) Step-down transformer (1)
c) H = I^2Rt (1)

Question 18 **(4 scores)**

18. (A) a) Electromagnetic induction (1)
b) Mechanical energy → electrical energy (1)
c) R – slip rings; they (with the brushes) carry the alternating current from the rotating coil to the external circuit. (1)
d) Replace the slip rings with a split ring commutator. (1)
(B) a) Any two: a motor converts electrical energy into mechanical energy, a generator converts mechanical into electrical energy; a motor works on the motor principle, a generator on electromagnetic induction; in a motor current is supplied to the coil, in a generator current is taken from the coil. (2)
b) Motor – Fleming's Left-Hand Rule; generator – Fleming's Right-Hand Rule. (2)

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