

SECTION A

1. The phenomena of light responsible for the working of the human eye is
- i) reflection ii) refraction iii) power of accommodation iv) persistence of vision 1
2. Unit of electric power may also be expressed as:
- i) volt-ampere ii) kilowatt-hour iii) watt-second iv) joule-second 1
3. i) Both A and R are true and R is correct explanation of the assertion. ii) Both A and R are true but R is not the correct explanation of the assertion. iii) A is true but R is false. iv) A is false but R is true.
- A) Assertion: The 200 W bulb glows with more brightness than 100W bulb
Reason: The 100W bulb has more resistance than a 200W bulb 1
- B) Assertion: Fuse wire must have high resistance and low melting point
Reason: Fuse is used for small current flow only 1
4. A student was asked to choose one concave mirror and one convex lens from a lot of mirrors and lenses of different kinds. The correct procedure adopted by her will be:
- (a) To choose a mirror and lens which can form an enlarged and erect image of an object
(b) To choose a mirror which can form a diminished and erect image and a lens which can form an enlarged and erect image of the object
(c) To choose a mirror which can form an enlarged and erect image and a lens which can form a diminished and erect image of an object
(d) To choose a mirror and a lens which can form a diminished and erect image of an object 1
5. Draw ray diagram showing the refraction of light through a glass prism and marked the angle of incidence as 'i', angle of emergence as 'e', angle of prism as 'A', and angle of deviation as 'd'. 2
6. There are m resistor each of resistance R . First they all are connected in series and equivalent resistance is X . Now they are connected in parallel and equivalent resistance is Y . What is the ratio of X and Y ? 2
7. What are magnetic field lines? Justify the following statement 'Magnetic field lines are closed curve.' 1+1

SECTION B

8. a) Mention two differences between a box type and a concentrator type solar heater.
b) It is difficult to use hydrogen as a source of energy, although its calorific value is very high. Explain? 2+1
9. Describe the steps involved in obtaining biogas and explain what is meant by anaerobic decomposition. 3
10. Draw a schematic levelled diagram of a domestic circuit which has a provision of a main fuse, meter, one light bulb and a socket. 3

SECTION C

11. a) Compare the magnetic field produced by solenoid with that of a bar magnet. Arabinda Maity(tutor)
b) Explain briefly the working of an electric generator. State Fleming's right hand rule. 1+(3+1)
12. a) Explain the terms used in relation to defects in vision and correction provided by them.
i) Bifocal lenses
ii) Hypermetropia (with levelled diagram)
b) A person with myopic eye cannot see objects beyond 1.2m directly. What should be the type of corrective lens and power of lens. (1+2)+2
13. i) What is visible spectrum? (ii) Why is red used as the stopping light at traffic signals?
iii) Two triangular glass prisms are kept together connected through their rectangular side. A light beam is passed through one side of the combination. Will there be any dispersion? Justify your answer. (1+2)+2
14. a) On entering in a medium from air, the speed of light becomes half of its value in air. Find the refractive index of that medium with respect to air?
b) A glass slab made of a material of refractive index n_1 is kept in a medium of refractive index n_2 . A light ray is incident on the slab. Draw the path of the rays of light emerging from the glass slab, if (i) $n_1 > n_2$ (ii) $n_1 = n_2$ (iii) $n_1 < n_2$ 2+3