Class X

Pre-Annual ~~Exam~~ ~~Prelim~~ - Solution Key.

Q7 (c) Towards the top of the paper.

Q8. (c) Oersted.

Q10 (b) 1 Watt hour = 3600 J.

Q11. (b) $= \frac{2}{3}\Omega$.

Q18. (a) both A and R are true & R is correct explanation of A.

Section B

Q 21. 2M

Four chara. of image formed by given ~~concave~~ convex lens:
Image is virtual, erect, diminished.
It is formed between focus F and optical centre O.
i.e on the same side of the lens as the object.

$u = -15\text{cm}, f = -30\text{cm}$,
$\frac{1}{f} = \frac{1}{v} - \frac{1}{u} \Rightarrow \frac{1}{v} = \frac{1}{f} + \frac{1}{u} = \frac{-1}{30} + \frac{-1}{15}$
$\frac{1}{v} = \frac{-3}{30} = -\frac{1}{10}$
$v = -10\text{cm}$

OR

Concave Mirror

$h = 1.2\text{ cm}, \quad f = -20\text{ cm}, \quad v = -60\text{ cm}.$

$\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$

$\frac{1}{u} = \frac{1}{f} - \frac{1}{v} \Rightarrow \frac{1}{u} = \frac{1}{-20} - \frac{1}{-60} \Rightarrow \boxed{u = -30\text{ cm}}$

$\frac{h'}{h} = \frac{-v}{u} \Rightarrow h' = \frac{-v}{u} \times h = \frac{+60}{-30} \times (+1.2) = -2.4\text{ cm}$

$\boxed{h' = -2.4\text{ cm}}$

Section C

Q28. 3M

$h_o = 10\text{cm}, \quad f = +12\text{cm}, \quad u = -18\text{cm},$

$\frac{1}{v} - \frac{1}{u} = \frac{1}{f} \Rightarrow \boxed{v = 36\text{ cm}}$

Convex lens

$m = \frac{v}{u} = \frac{h'}{h} \Rightarrow \frac{+36}{-18} = \frac{h'}{10} \Rightarrow h' = \frac{-36 \times 10}{18} = -20\text{cm}$

$\boxed{h' = -20\text{ cm}}$ → -ve sign means inverted image.

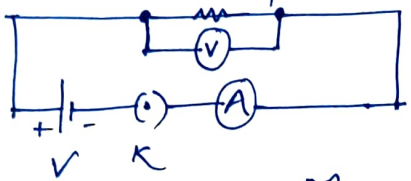
∴ Image is real and inverted.

Q29. Conclusion:

[3M] Current flowing through the wire is directly proportional to the potential difference

$V \propto I$

Resistance of Nichrome wire



OR.

(i). Electric power is rate at which electric energy is consumed by electrical device in an electric circuit.
SI unit - Watt (W).

(ii) $P = 2\ kW$, $t = 2\ h$.

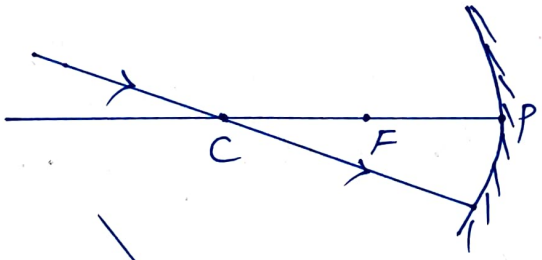
$E = Pt = 2 \times 2 = 4\ kWhr.$

$E = 4 \times 3.6 \times 10^6\ J = 14.4 \times 10^6\ J$

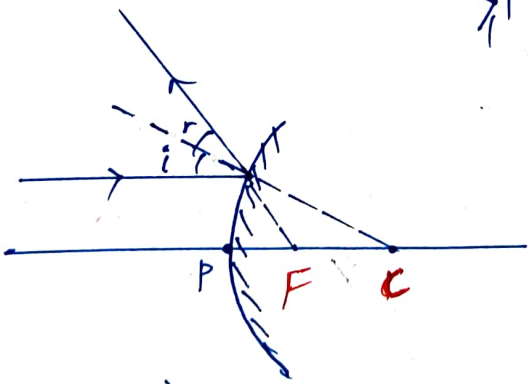
$\boxed{E = 14.4 \times 10^6\ J}$

Q31.

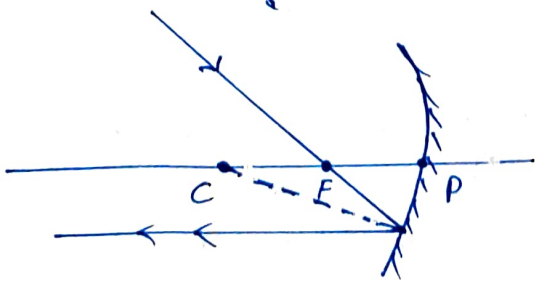
[3M] (i)



(ii)

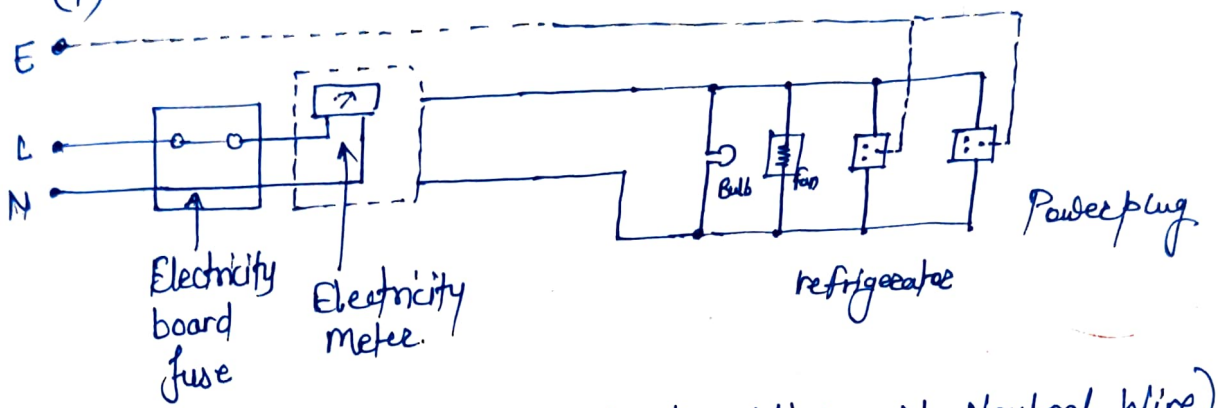


(iii)



Q36. [5M]

(i)



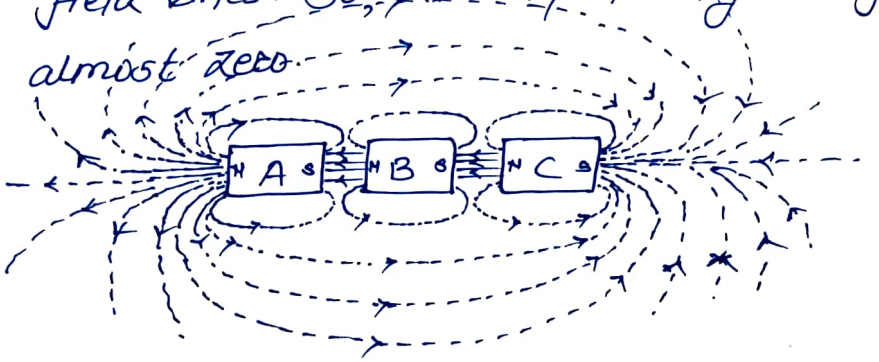
(E: Earth wire, L= live Wire, N- Neutral Wire)

(ii) Max^m magnetic field is in region A & C.

Min " " " region B.

As A & C have maximum number of magnetic field lines, which determines intensity of magnetic field.

Whereas B is centre of magnet that has no magnetic field lines. So, intensity of magnetic field near B is almost zero.



Section E

Q39.

[1] (i) Convex lens

[1] (ii) Height of image / Height of object

[2] (iii) $m = 3$ ...given, $m = \frac{v}{u} \Rightarrow 3 = \frac{24\,cm}{u} \Rightarrow u = \frac{24}{3}\,cm = 8\,cm$

OR $\therefore u = 8\,cm \leftarrow$ Object distance.

OR.

[2] (iii) $P_1 = \frac{1}{f_1}$, $P_2 = \frac{1}{f_2} \Rightarrow \frac{P_1}{P_2} = \frac{f_2}{f_1} = \frac{4}{1} \Rightarrow \boxed{\frac{f_1}{f_2} = \frac{1}{4}}$