DAV PUBLIC SCHOOLS, JHARKHAND ZONE-B

12-1-18

Pre Board Exam. - 2017-18

Marking Scheme (XII) - 042 Set-I

01. Due to short wavelength / High frequency — 01 mark.

02. AND Gate — ½

Y = 0 — ½

03 $10 \times 10^{-1}$ ohm — Brown, Black & Gold

04. Nature of the Lens will change i.e. Convex Lens.

05. $q_1 = -ve$, $q_2 = +ve$

$q_1/q_2 = -1:1$

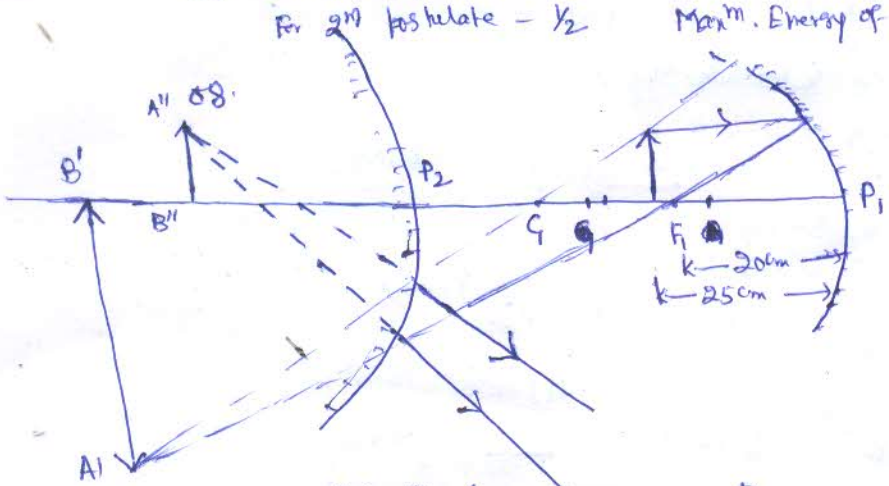
06. $A_1$ — 78 $A_1^{182}$

$A_4$ — 70 $A_4^{178}$

07. For one postulate — ½ Expression for total energy — ½

For 2nd postulate — ½ Max$^m$. Energy of electron — ½

08.




(i) For Concave mirror

$\frac{1}{f_1} = \frac{1}{v_1} + \frac{1}{u_1}$

$\frac{1}{v_1} = \frac{1}{f_1} - \frac{1}{u_1} = \frac{1}{-20} - \frac{1}{-25}$

$= \frac{1}{-20} + \frac{1}{25} = \frac{-5+4}{100} = -\frac{1}{100}$ Cm.

As $v_1$ is -ve, the image A'B' is real and is formed infront of Concave mirror such that $P_1B' = 100$ Cm.

$\boxed{v_1 = -100 \text{ Cm.}}$

(ii) For Convex mirror, the image B'B' acts Virtual object

$u_2 = (100 - 50) = 50$ Cm., $f_2 = +15$ Cm.

$\frac{1}{v_2} = \frac{1}{f_2} - \frac{1}{u_2} = \frac{1}{15} - \frac{1}{150} = \frac{7}{150}$

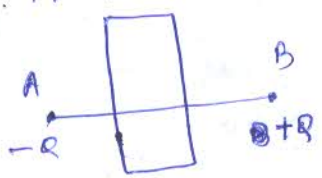
$v_2 = \frac{150}{7}$ Cm. $= 21.43$ Cm.

As $v_2$ is +ve, the final image A''B'' is virtual and is formed behind the Convex mirror such that $P_2B'' = 21.43$ Cm.

9 (a) Work done = 0 — ½

Justification — Equipotential surface / $q \times (V_A - V_B) = 2 \times 0 = 0$ — ½

Diagram of equipotential surface due to electric dipole — 01



(10) Capacitor is fully charged then Conduction current and displacement current is zero — ½

Proof of $\boxed{i_d = i}$

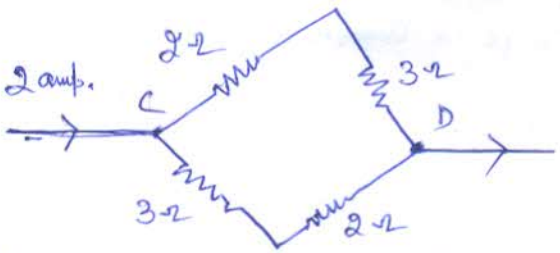
$i_d = \varepsilon_0 \frac{d\Phi_E}{dt}$ — ½

$i_d = \varepsilon_0 \frac{d}{dt}(E \times A)$ — ½

$i_d = \varepsilon_0 \frac{d}{dt}\left(\frac{q}{\varepsilon_0 A} \times A\right)$ — ½

$i_d = dq/dt = i$

(11)




$(V_A - V_B) = (V_A - V_D) + (V_D - V_B)$

$= 3i_1 + 2(i - i_1)$ — 1 mark

$(V_A - V_B) = 2i + i_1$ — (1)

Again $(V_A - V_B) = (V_A - V_C) + (V_C - V_B)$

$= 2i_1 + 3(i - i_1)$

$(V_A - V_B) = 3i - i_1$ — (ii) — 1 mark

From eqn. (i) and (ii)

$2i + i_1 = 3i - i_1$

$2i_1 = i$ (put $i = 2$ amp) — ½ mark

$\boxed{i_1 = 1 \text{ amp}}$

put the value of $i$ and $i_1$ in eqn. (i) or in eqn. (ii)

$(V_A - V_B) = 5$ Volt — ½ mark

12 Statement — ½ mark

Construction of wavefront — ½ mark

Derivation of Snell's Law — 2 marks.

13. (a) position of nth dark fringe.

$x_n = \frac{(2n-1) D\lambda}{2d}$ — ½

put $n = 6$

$x_6 = \frac{11 D\lambda}{2d}$ — ½

Put numerical value.

$D = ?$

(b) $\beta_{Air} = \frac{D\lambda_{air}}{d}$ } 01

$\beta_{air}$ = Result

(c) $\beta_{Water} = \frac{1}{\mu_{water}} \times \beta_{air}$ = Result — 01

(14) (a) Thicker means — Gross-sectional Area $R = \rho \cdot l/A$ $R_{Al} =$

$\frac{A_{Constantan}}{A_{Cu}} = \frac{\rho_{Constantan}}{\rho_{Cu}}$ — } 01

($\rho_{Constantan} > \rho_{Cu}$)

$A_{Constantan} > A_{Cu}$

(b) — 01 mark

(c) — 01 mark.

(15) $B = 3000$ Gauss $= 3000 \times 10^{-4}$ Tesla

$\vec{B} = 0.3\hat{k}$

$A = 10\text{cm} \times 5\text{cm} = 50\text{cm}^2 = 50 \times 10^{-4}\text{m}^2$

$i = 12$ amp, $iA = 12 \times 50 \times 10^{-4}$ A-m$^2$ $= 0.06$ A-m$^2$.

(a) $\vec{\tau} = \vec{iA} \times \vec{B} = 0.06\hat{i} \times 0.3\hat{k} = -1.8 \times 10^{-2}\hat{j}$ N-m — 1 marks

(b) $\vec{\tau} = \vec{iA} \times \vec{B} = 0.06\hat{i} \times 0.3\hat{k} = -1.8 \times 10^{-2}\hat{j}$ N-m. — 1 marks

(c) $\vec{\tau} = \vec{iA} \times \vec{B} = -0.06\hat{j} \times 0.3\hat{k} = -1.8 \times 10^{-2}\hat{i}$ N-m. — 1 marks.

(16) Expression for average power in L-C-R — 2 marks

Average power in L-R Circuit — 1 marks.

(17) Plotting of $B \cdot E/A$ and Mass No. graph — 01 mark

Impact. Conclusion — ½ mark each.

Release of energy of Nuclear fusion — ½ marks

Release of energy of Nuclear fission — ½ marks.

(18) (a) Lenz Rule — 02

(b) Explanation. — 01.

(19) (a) — 1 marks

(b) — 1 marks

(c) — 1 marks.

(20) (a) — 1 marks

(b) — 1 marks

(c) — 1 marks

(21) (a) Cut out characteristics — 01 marks

(b) — 01 marks

(c) — 01 marks.

(22) Derivation — 2 marks

Nature of force — 1 marks.

(23) (a) — 01 mark

(b) — 01 marks

(c) — 01 marks

(d) — 01 mark

(24) (i) Statement — 01 marks

(ii) Derivation — 03 marks

(iii) — 01 marks.

OR

(a) — 01 mark.

(b) — 02 marks.

(c) — 01 marks

(d) — 01 marks.

(25) Derivation of Lateral wave — 02 marks
Height of T.V. tower — 01 mark
Height of transmitting Antenna — 01 mark

OR

Two drawbacks — 01
Block diagram — 02 marks
Explanation — 03 marks
Numerical — 01 mark.

26 Diagram — 02
Derivation — 03

OR

Identification of graph — ½ + ½
Distinction — 01
Explanation of diffraction pattern due to single-slit — 03

12-1-18

DAV PUBLIC SCHOOLS, JHARKHAND ZONE-B

Pre Board Exam (2017-18)

Marking Scheme (XII) - 042 Set - II

01 — See the Answer of Q.N. 03 Set I

02 - OR Gate. — ½

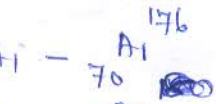
Y = 1 — ½

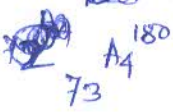
03. Nature of the Lens will change i.e. Convex lens. — 01

04.  Due to Short wavelength. — 01.

05. $q_1 = -ve$, $q_2 = +ve$

$q_1/q_2 = -1:1$

06. $A_1$ —  176

$A_4$ —  180

73

07. See the answer of Q.N. 09 (Set I)

08. See the answer of Q.N - 10 (Set I)

09. See the answer of Q.N. - 07 (Set I)

10. See the answer of Q.N - 08 (Set I)

11. See the answer of Q.N. - 11 (Set I)

12 See the answer of Q.N - 13 (Set I)

13. See the answer of Q.N - 14 (Set I)

14. See the answer of Q.N - 15 (Set I)

15. See the answer of Q.N. - 22 (Set I)

16. See the answer of Q.N. - 16 (Set I)

17 See the answer of Q.N - 17 (Set I)

18. See the answer of Q.N 18 (Set I)

19. See the answer of Q.No. 20 (Set I)

20 See the answer of Q.No. - 19 (Set I)

21 See the answer of Q.No. - 21 (Set I)

22. See the answer of Q.NO - 12

23. See the answer of Q.NO. - 13

24. See Q.No - 25 of Set I

25 See Q.NO. - 24 of Set I

26 See Q.NO. - 26 of Set I