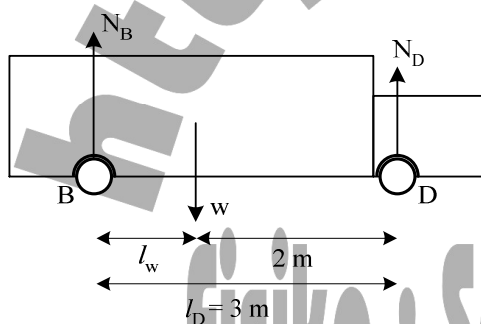


31. Jawab : D

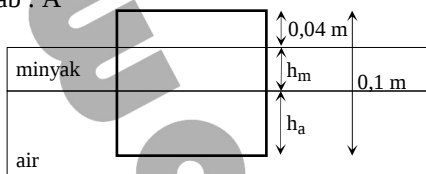
$$\begin{aligned}
 EK_{\text{foton}} : EK_{\text{elektron}} &= h \frac{c}{\lambda} : \frac{1}{2} m v^2 = h \frac{c}{\lambda} : \frac{1}{2} \frac{(m v)^2}{m} \\
 &= h \frac{c}{\lambda} : \frac{1}{2} \frac{(m v)^2}{m} = h \frac{c}{\lambda} : \frac{1}{2} \frac{p^2}{m} \\
 &= h \frac{c}{\lambda} : \frac{\left(\frac{h}{\lambda}\right)^2}{2m} = \left(\frac{h}{\lambda}\right) c : \left(\frac{h}{\lambda}\right)^2 \frac{1}{2m} \\
 &= c : \frac{h}{\lambda} \frac{1}{2m} = 2mc\lambda : h \\
 \frac{EK_{\text{foton}}}{EK_{\text{elektron}}} &= \frac{2mc\lambda}{h} \\
 &= \frac{2 \times (9,1 \times 10^{-31}) \times (3 \times 10^8) (6,6 \times 10^{-11})}{6,63 \times 10^{-34}} \\
 &= 54,35 \approx 54
 \end{aligned}$$

32. Jawab : B



$$\begin{aligned}
 w &= m g = 3.000 \times 10 = 30.000 \text{ N} \\
 l_w &= 3 - 2 = 1 \text{ m} \\
 \Sigma \tau &= 0 \\
 N_D l_D - w l_w &= 0 \\
 N_D &= \frac{w l_w}{l_D} = \frac{30.000 \times 1}{3} = 10.000 \text{ N} = \mathbf{10 \text{ kN}}
 \end{aligned}$$

33. Jawab : A



$$\begin{aligned}
 h_m &= 0,1 - 0,04 - h_a = 0,06 - h_a \\
 w &= F_a + F_m \\
 \rho_b V_b g &= \rho_a V_a g + \rho_m V_m g \\
 \rho_b h_b &= \rho_a h_a + \rho_m h_m \\
 0,5 \times 0,1 &= 1 \times h_a + 0,8 \times (0,06 - h_a) \\
 0,05 &= 0,2 h_a + 0,048 \Rightarrow h_a = 0,01 \text{ m} \\
 h_m &= 0,06 - 0,01 = 0,05 \text{ m} \\
 P &= P_o + P_a + P_m = 1 \times 10^5 + \rho_a g h_a + \rho_m g h_m \\
 &= 10^5 + 1000 \times 10 \times 0,01 + 800 \times 10 \times 0,05 \\
 &= 100.500 \text{ Pa} = \mathbf{100,5 \text{ kPa}}
 \end{aligned}$$

34. Jawab : C

$$\begin{aligned}
 (Q_{\text{lepas}})_1 &= (Q_{\text{terima}})_1 \\
 10 c_t (125 - 23) &= m_a c_a (23 - 20) \\
 1020 c_t (125 - 23) &= m_a 1 (23 - 20) \Rightarrow m_a = \frac{1020 c_t}{3} \\
 m_a &= 340 c_t \\
 (Q_{\text{lepas}})_2 &= (Q_{\text{terima}})_2 \\
 m c_t (125 - 25) &= m_a 1 (25 - 20) \\
 100 m c_t &= 5 \times 340 c_t \Rightarrow m = \frac{1700}{100} = \mathbf{17 \text{ gram}}
 \end{aligned}$$

35. Jawab : C

$$I_2 = I_o \cos^2 \theta$$

$$\frac{I_2}{I_o} = \cos^2 \theta = \cos^2 60^\circ = \left(\frac{1}{2}\right)^2 = \frac{1}{4} = \mathbf{25 \%}$$

36. Jawab : B

$$M = 750 \text{ x}$$

$$f_{ob} = 0,4 \text{ cm}$$

$$d = 20 \text{ cm}$$

$$s'_{ok} = \infty \Rightarrow \text{mata tak berakomodasi : } s_{ok} = f_{ok}$$

$$pp = 25 \text{ cm}$$

$$d = s'_{ob} + s_{ok} = s'_{ob} + f_{ok}$$

$$s'_{ob} = d - f_{ok} = 20 - f_{ok}$$

$$s_{ob} = \frac{s'_{ob} f_{ob}}{s'_{ob} - f_{ob}} = \frac{(20 - f_{ok}) \times 0,4}{(20 - f_{ok}) - 0,4} = \frac{0,4(20 - f_{ok})}{19,6 - f_{ok}}$$

$$M = M_{ob} \times M_{ok}$$

$$750 = \frac{s'_{ob}}{s_{ob}} \times \frac{pp}{f_{ok}} = \frac{20 - f_{ok}}{0,4(20 - f_{ok})} \times \frac{25}{f_{ok}} = \frac{25(19,6 - f_{ok})}{0,4 f_{ok}}$$

$$12 f_{ok} = 19,6 - f_{ok} \Rightarrow f_{ok} = \frac{19,6}{13} = 1,48 \approx \mathbf{1,5 \text{ cm}}$$

37. Jawab : B

$$P = \frac{1}{f} = \left(\frac{n_L}{n_M} - 1\right) \times \left(\frac{1}{R_1} + \frac{1}{R_2}\right)$$

$$P_A : P_U = \left(\frac{n_L}{n_A} - 1\right) : \left(\frac{n_L}{n_U} - 1\right) = \left(\frac{\frac{3}{2}}{\frac{4}{3}} - 1\right) : \left(\frac{\frac{3}{2}}{1} - 1\right)$$

$$P_A : 5 = \left(\frac{9}{8} - 1\right) : \left(\frac{3}{2} - 1\right) = \frac{1}{8} : \frac{1}{2} = 2 : 8 = 1 : 4$$

$$P_A = \frac{1}{4} \times 5 = \frac{5}{4} \text{ dioptri}$$

38. Jawab : C

$$C_1 = \frac{r_1}{k} = \frac{1 \times 10^{-2}}{9 \times 10^9} = \frac{1}{9} \times 10^{-11} \text{ F}$$

$$C_2 = \frac{r_2}{k} = \frac{2 \times 10^{-2}}{9 \times 10^9} = \frac{2}{9} \times 10^{-11} \text{ F}$$

$$\text{Mula-mula : } q_1 = 2 \times 10^{-7} \text{ C dan } q_2 = 0$$

Setelah dihubungkan :

$$V'_1 = V'_2$$

$$\frac{q'_1}{C_1} = \frac{q'_2}{C_2}$$

$$q'_1 = \frac{C_1}{C_2} \times q'_2 = \frac{\frac{1}{9} \times 10^{-11}}{\frac{2}{9} \times 10^{-11}} \times q'_2 = \frac{1}{2} q'_2$$

$$q'_1 + q'_2 = q_1 + q_2$$

$$\frac{1}{2} q'_2 + q'_2 = 2 \times 10^{-7} + 0$$

$$\frac{3}{2} q'_2 = 2 \times 10^{-7} \Rightarrow q'_2 = \frac{4}{3} \times 10^{-7} \text{ C} \Rightarrow 2 \text{ benar}$$

$$V'_2 = \frac{q'_2}{C_2} = \frac{\frac{4}{3} \times 10^{-7}}{\frac{2}{9} \times 10^{-11}} = \mathbf{6 \times 10^4 \text{ V}} \Rightarrow 4 \text{ benar}$$

di dalam bola : $E = 0 \Rightarrow 1$ salah, maka 3 juga salah