

第1問 解答例

[A]

(1) $\frac{L}{4}$
(2) $m_1g + m_2g + kx$
(3) $\frac{m_2gL}{4} \cos \theta$
(4) $\frac{3kxL}{4} \cos \theta$
(5) $\frac{1}{3k}(m_2g - m_1g)$
(6) m_1

[B]

(7) $\sqrt{\frac{2L}{g}}$
(8) $2mg$
(9) $2\sqrt{gL}$
(10) $-\frac{3}{4}g$
(11) $\frac{3}{4}mgL$
(12) $\frac{1}{2}L$
(13) $\frac{1}{2}mg$
(14) $\frac{2}{3}L$

第2問

[A]

解答例
(1) IBh
(2) 上向き
(3) $h\omega eB/2$
(4) d
(5) $Bh^2 \tan(\omega\Delta t)/2$
(6) $Bh^2\omega/2$

[B]

解答例
(7) 3.7
(8) 0.6
(9) $R\left(\frac{E}{R+r_0}\right)^2, \frac{E^2}{\left(\sqrt{R-\frac{r_0}{\sqrt{R}}}\right)^2+4r_0}$ など
(10) r_0
(11) $\frac{E_1-V_{ab}}{r}$
(12) $\frac{E_S}{n}$
(13) $3.2 < E_3 < 3.5$

第3問 解答例

[A]

(1) $T = 0.4$ $\lambda = 2$ $v = 5$
(2) $5\pi t + \frac{\pi}{2}$
(3) πx
(4) $5\pi \left(t - \frac{x}{5} \right) + \frac{\pi}{2}$
(5) P_2, P_6
(6) P_3
(7) 1.3

[B]

(8) ドップラー
(9) $\frac{v}{f_s}$
(10) $\frac{v-v_B}{v} f_s$
(11) $\frac{v}{v+v_B} f_B$
(12) $\frac{2v_B}{v+v_B} f_s$
(13) 20
(14) $V_C \sin\theta$
(15) $\frac{v-v_C \sin\theta}{v+v_C \sin\theta} f_s$
(16) ③