2025年度　学部一般入試〈物理〉【解答例】

【1】

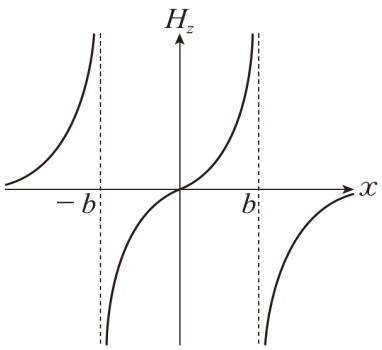
(1)	$a\sqrt{\dfrac{k}{m}}$	(2)	$2\pi\sqrt{\dfrac{m}{k}}$
(3)	$\dfrac{mg\sin\theta}{k}$	(4)	$\dfrac{1}{2}kb^2-\dfrac{m^2g^2}{2k}\sin^2\theta$
(5)	$v_A=v_0,\quad v_P=-\dfrac{m}{2M+m}v_0$	(6)	$v_0\sqrt{\dfrac{2(M+m)m}{(2M+m)k}}$
(7)	$\dfrac{m\alpha_0}{k}$	(8)	$v_0\sqrt{\dfrac{8(M+m)^3k}{(2M+m)m}}$

【2】

〔A〕

(1)	$H_A=-\dfrac{I}{2\pi(x_0-a)}$, (オ)			$H_C=-\dfrac{I}{2\pi(x_0+a)}$, (オ)		
(2)	①	$\dfrac{\mu Iav\cdot\Delta t}{\pi(x_0-a)}$	②	$\dfrac{\mu Iav\cdot\Delta t}{\pi(x_0+a)}$	③	$\dfrac{2\mu Ia^2v\cdot\Delta t}{\pi({x_0}^2-a^2)}$
	④	$\dfrac{2\mu Ia^2v}{\pi({x_0}^2-a^2)}$	⑤⑥	(イ)		
(3)	$\dfrac{4\mu^2I^2v^2}{9\pi^2R}$		(4)	$F=\dfrac{4\mu^2I^2v}{9\pi^2R}$, (ア)		

〔B〕

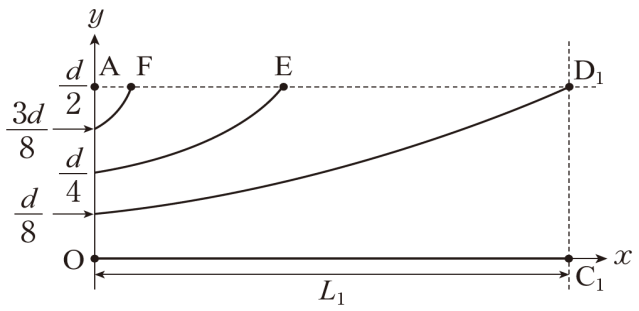
(5)		(6)	$\dfrac{4\mu vIa^2}{\pi(b-a)(b+a)R}$
		(7)	ゼロ
		(8)	$2b+\sqrt{a^2+3b^2}$

【3】

〔A〕

(1)	$l_{\mathrm{A}} \fallingdotseq L_0\left\{1+\frac{1}{2}\left(\frac{2h-d}{2L_0}\right)^2\right\},\quad l_{\mathrm{B}} \fallingdotseq L_0\left\{1+\frac{1}{2}\left(\frac{2h+d}{2L_0}\right)^2\right\}$		
(2)	$f_0=\frac{VL_0}{h_0 d}$	(3)	$\frac{V+V_0}{V}f_0$

〔B〕

(4)	$f_1=\frac{V}{\sqrt{{L_1}^2+d^2}-L_1}$	(5)	$d=\frac{8}{15}L_1$
(6)			
(7)	$\frac{7}{45}L_1$	(8)	$L_2=\frac{47}{2070}L_1$