

# 2026年度 名古屋大学 前期 物理

## 問題 I

(1)	[答] $V_1 = \sqrt{\frac{k}{m} d^2 - 2gd \sin \phi}$	
(2)	[答] $\tan \phi = \frac{V_{2y}}{V_{2x} + V_3}$	
(3)	[答] $mV_{2x} - MV_3 = 0$	
(4)	[答] $\tan \phi' = \frac{V_{2y}}{V_{2x}}$ と (2) の [答] より, $\tan \phi' > \tan \phi \quad \therefore \phi' > \phi$	
(5)	[答] $t_1 = \frac{v_0 \sin \theta}{g}$	[答] $h = \frac{v_0^2 \sin^2 \theta}{2g}$
(6)	[答] $l = \frac{v_0^2 \sin \theta \cos \theta}{g}$	
(7)	[答] $E_0 = m_1 g \left( H + \frac{L^2}{4H} \right)$	
(8)	[答] $-m_1 v_1 + m_2 v_2 = m_1 v_0 \cos \theta$	
(9)	[答] $v_1 = \frac{-m_1 + e m_2}{m_1 + m_2} v_0 \cos \theta$	[答] $v_2 = \frac{(1+e) m_1}{m_1 + m_2} v_0 \cos \theta$
(10)	[答] $1 - e^2$	

問題 II

(1)

[答]  

$$s_1(x) = \frac{1}{2}(l-x)^2$$

(2)

[答]  

$$c_1(x) = \frac{3\varepsilon_0(l-x)^2}{5d}$$

(3)

[答]  

$$c_0(x) = \frac{\varepsilon_0 x(2l-x)}{2d}$$

(4)

[答]  

$$C(x) = \frac{\varepsilon_0(6l^2 - 2lx + x^2)}{10d}$$

(5)

[答]  

$$U(x) = \frac{\varepsilon_0(6l^2 - 2lx + x^2)V^2}{20d}$$

(6)

[答]  

$$U(x+\Delta) - U(x) = \frac{\varepsilon_0\{-2l\Delta + 2x\Delta + (\Delta)^2\}V^2}{20d}$$

(7)

[答]  

$$W_I(x) = 2\{U(x+\Delta) - U(x)\}$$

(8)

[答]  

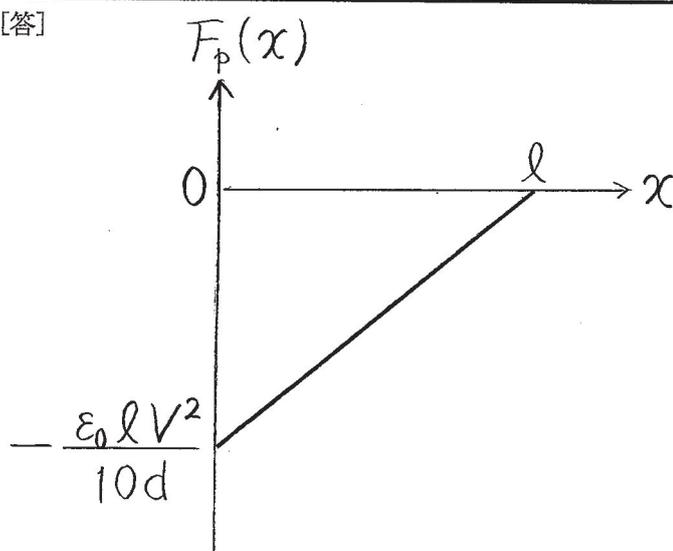
$$W_F(x) = -\{U(x+\Delta) - U(x)\}$$

(9)

[答]  

$$F_D(x) = \frac{\varepsilon_0(x-l)V^2}{10d}$$

(10)



問題 III

(1)	[答] $\lambda = \frac{V}{f}$	
(2)	[答] $X^2 + Y^2 = (Vt)^2$	
(3)	[答] $X_A = (V + w)t$	[答] $X_B = -(V - w)t$
(4)	[答] $\Delta X_A = \frac{V + w}{f}$	[答] $f_1 = f$
	[答] $\Delta X_B = \frac{V - w}{f}$	[答] $f_2 = f$
(5)	[答] $(X - wt)^2 + Y^2 = (Vt)^2$	
(6)	[答] $\Delta Y = \frac{\sqrt{V^2 - w^2}}{f}$	[答] $f_3 = f$
(7)	[答] $f_4 = \frac{V + w - u}{V + w} f$	[答] $f_5 = \frac{\sqrt{V^2 - w^2} + u}{\sqrt{V^2 - w^2}} f$
(8)	[答] $L = \frac{V^2 - w_0^2}{4fw_0}$	
(9)	[答] $d = \frac{V^2 - w_0^2}{4fV}$	