

I

(1) $\sqrt{\frac{k}{m}} d$	(2) $\sqrt{\frac{k}{m} d^2 - 2gr(1 - \cos \theta)}$
(3) $\frac{k}{r} d^2 - mg(2 - 3 \cos \theta)$	(4) $\sqrt{\frac{5mgr}{k}}$
(5) $\sqrt{\frac{gl^2}{4r}} \cong v_A \cong \sqrt{\frac{gl^2}{2r}}$	
(6)(ア) $-\frac{2}{3} \sqrt{\frac{gl^2}{3r}}$	(イ) $\frac{1}{3} \sqrt{\frac{gl^2}{3r}}$
(7) $\frac{15 - 4\sqrt{3}}{9} l$	

II

(1) (ア) 電流	(イ) 抵抗 (抵抗値)	(ウ) 小さく	(エ) 整流作用
(オ) 大きく	(カ) 光	(キ) 電気	
(2) (ア) $1.0 \times 10^3 \Omega$ (1.0 k Ω)		(イ) $5.0 \times 10^2 \Omega$ (0.50 k Ω)	
(3) 0.60	V	(4) 10	mA
(5) 4.0×10^{-3} (0.0040)	W	(6) E	[V]
(7) $\frac{E}{r}$	[A]	(8) $\frac{RE^2}{(r+R)^2}$	[W]
(9) 1			

III

<p>(1)</p> $T_A = \frac{p_A V_1}{R}$	<p>(2)</p> $T_B > T_C$	
<p>(3) (ア)</p> $\Delta U_{A \rightarrow B} = \frac{3}{2} R (T_B - T_A)$	<p>(イ)</p> $Q_{A \rightarrow B} = 0$	<p>(ウ)</p> $W_{A \rightarrow B} = \frac{3}{2} R (T_A - T_B)$
<p>(4) (ア)</p> $W_{B \rightarrow C} = 0$	<p>(イ)</p> $Q_{B \rightarrow C} = \frac{3}{2} R (T_C - T_B)$	<p>(ウ)</p> <p style="text-align: center;">負</p>
<p>(5) (ア)</p> $Q_{D \rightarrow A} = \frac{3}{2} R (T_A - T_D)$	<p>(イ)</p> <p style="text-align: center;">正</p>	
<p>(6)</p> $W = \frac{3}{2} R (T_A - T_B + T_C - T_D)$		
<p>(7)</p> $1 - \frac{T_B - T_C}{T_A - T_D}$		