

物理参考答案

命题：浙江省温州中学 审核：浙江金华第一中学

一、选择题 I

题号	1	2	3	4	5	6	7	8	9	10
答案	A	D	C	C	C	B	C	B	C	D

二、选择题 II

题号	11	12	13
答案	AB	AC	BD

14-I. (1)C (1分) (2)0.55 (1分) (3) $\frac{1}{2}m(g-a)$ (2分)

14-II. CD (2分)

14-III. (1)2000 (1分) 50 (1分) 偏小 (2分) (2)黑 (1分) $\times 1k$ (1分) 8950 (2分)

15. (1) 不能确定, 增大 (2分)

(2) $\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$ (1分) $V_2 = V_1 - Sh$ (1分) $T_2 = 600T$ (1分)

(3) $\Delta U = 2490J$ (1分) $\Delta U = W + Q$ (1分) $W = 2515J$ (1分)

16. (1) ① $mgh = \frac{1}{2}mv_A^2$ (1分)

$F_N = m\frac{v_A^2}{R} = 20N$ (1分)

根据牛顿第三定律得

$F_{EK} = F_N = 20N$ 方向水平向左 (1分)

② $mg(h+R) = \frac{1}{2}mv_1^2$ (1分)

$v_2 = \frac{1}{3}v_1 = \sqrt{5}m/s$

$mv_2 = (m+m_Q)v$

$\frac{1}{2}mv_1^2 = \frac{1}{2}(m+m_Q)v^2 + E_P$

$m_Q = 3.2kg$ (2分)

(2) $mv_3 = (m_P + m_Q)v_4$

$mg(h+R) = \frac{1}{2}mv_3^2 + \frac{1}{2}(m_P + m_Q)v_4^2$

$v_3 = 6m/s, v_4 = 1.5m/s$ (1分)

$$mv_3 - m_Q v_4 = (m + m_Q)v_5 \quad (1 \text{ 分}) \quad v_5 = 1 \text{ m/s}$$

$$2\mu mgL = \frac{1}{2}mv_3^2 + \frac{1}{2}m_Q v_4^2 - \frac{1}{2}(m + m_Q)v_5^2 \quad L = \frac{15}{8} \text{ m} \quad (1 \text{ 分})$$

$$E_p = \mu mgL = 7.5 \text{ J} \quad (2 \text{ 分})$$

$$17. (1) E = (\pi - 1)l^2 \frac{B_0}{t_0} \quad (1 \text{ 分}) \quad I = \frac{E}{8lR} \quad (1 \text{ 分})$$

$$I = \frac{(\pi-1)lB_0}{8Rt_0} \quad (1 \text{ 分}) \quad \text{方向逆时针} \quad (1 \text{ 分})$$

$$(2) Q = I^2 l R t_0 \quad (1 \text{ 分})$$

$$P = \frac{Q}{2t_0} = \frac{(\pi-1)^2 l^3 B_0^2}{128 R t_0^2} \quad (1 \text{ 分})$$

$$(3) U_{af} = I(2l)R - \varepsilon_{af} \quad (1 \text{ 分})$$

$$\varepsilon_{af} = \frac{1}{8}\pi(2l)^2 \frac{B_0}{t_0} \quad (1 \text{ 分})$$

$$U_{af} = \frac{-(\pi+1)B_0 l^2}{4t_0} \quad (1 \text{ 分})$$

$$(4) I_A = mv \quad (1 \text{ 分})$$

$$I_A = \sum B \frac{(\pi-1)l\Delta B}{8R\Delta t} (2\sqrt{2}l)\Delta t = \frac{\sqrt{2}(\pi-1)l^2 B_0^2}{8R} \quad (1 \text{ 分})$$

$$v = \frac{\sqrt{2}(\pi-1)l^2 B_0^2}{8mR} \quad (1 \text{ 分})$$

$$18. (1) U_1 q = \frac{1}{2}mv_0^2 \quad (1 \text{ 分})$$

$$y = \frac{1}{2}at^2 \quad (1 \text{ 分})$$

$$t = \frac{L}{v_0} \quad (1 \text{ 分})$$

$$a = \frac{U_2 q}{hm} \quad (1 \text{ 分})$$

若该颗粒不能 100% 被收集，则其竖直方向上运动的最大位移 $y = \frac{U_2 L^2}{4U_1 h}$ ，与 q 、 m 无关。

$$\text{收集率 } \eta = \frac{y}{h} \text{ 相同} \quad (1 \text{ 分})$$

$$(2) \textcircled{1} R = \frac{mv_0}{Bq} = L \quad (1 \text{ 分})$$

$$\sin\theta = \frac{L}{2R} = \frac{1}{2} \quad \theta = \frac{\pi}{6} \quad (1 \text{ 分})$$

$$t_2 = \frac{\pi L}{6v_0} \quad (1 \text{ 分})$$

$$\textcircled{2} \quad t = \frac{L + \frac{\pi}{6}L}{v_0} \quad (1 \text{ 分}) \quad y = \frac{1}{2}at^2 \quad (1 \text{ 分}) \quad \eta = \frac{y}{h} = 50\% \quad (1 \text{ 分})$$

$$\textcircled{3} \quad P = (U_1q + \frac{1}{4}U_2q + \frac{1}{8}U_2q)nhL = (\frac{19}{64} + \frac{19\pi}{192})U_1qnL^2 \quad (2 \text{ 分})$$