2021 年高考河北卷物理真题答案

一、选择题

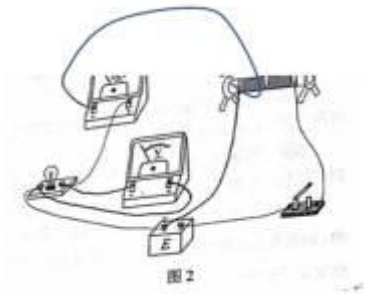
1、C　2、C　3、B　4、D　5、B　6、A　7、A

二、多选题

8、B,C　9、B,D　10、A,C,D

三、简答题

11、



(1)

(2) C

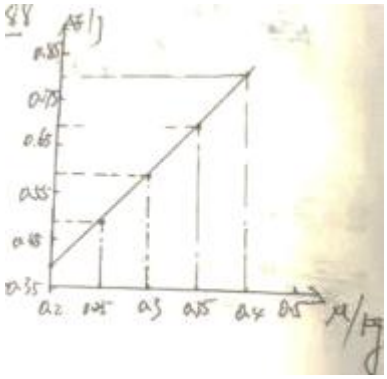
(3) V=2v，I=94mA

$\therefore R_L = \frac{V}{I} = \frac{2}{74\times10^{-3}}\Omega = 27.0\Omega$

12、

(1) 0.980

(2)0.588



(3) 0.400

13、

(1) 背包: $a_1 = g\sin\theta - \mu g\cos\theta = 2m/s^2$ ①

$$x_{AB} = \frac{1}{2}a_1(t+1)^2 = v_0 t + \frac{1}{2}a_2 t^2$$ ②

解得;t=2s (t=-1s,舍去)

$x_{AB} = 9$ m

(2)此时背包 $v_1 = a_1(t+1) = 6m/s$

滑雪者的速度 $v_2 = v_0 + a_2 t = 7.5m/s$

根据动量守恒定理; $mv_1 + Mv_2 = (m+M)v$

代入数据得: $v_{共} = 7.44m/s$

14、

(15). (1) .大于 ①

(2) .

（i）$T_1 = 273 + 27 = 300K$

$T_2 = 273 + 37 = 310K$

$P_1 = 3.0 \times 10^3 \mathrm{p}_a$

$P_2 = ?$

$\frac{P_1}{T_1} = \frac{P_2}{T_2} \therefore P_2 = \frac{310}{300} \times P_1 = 3.1 \times 10^3 \mathrm{p}_a$

（ii）等温时$\mathrm{p}_1 = 3 \times 10^3 \mathrm{p}_a$. $v_1 = v_0$

$\mathrm{p}_2 = 1.0 \times 10^5 \mathrm{p}_a$

$v_2 = ?$

$\mathrm{p}_1\mathrm{v}_1 = \mathrm{p}_2\mathrm{v}_2$

$\mathrm{v}_2 = \frac{3}{100}\mathrm{v}_0$

进入的气体 $\Delta \mathrm{v} = (1 - \frac{3}{100})\ \mathrm{v}_0 = \frac{97}{100}\mathrm{v}_0$

$\therefore \mathrm{m}_{进} : \mathrm{m}_0 = 97 : 3$

（16）．选修 3-4

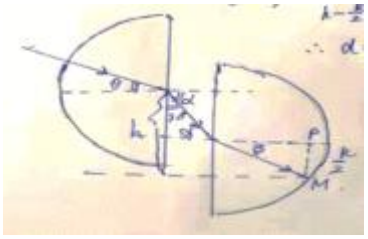
(i)当 $\theta = 60°$ 时全反射，$\theta = \frac{1}{n}$，$\therefore \mathrm{n} = \sqrt{3}$

(ii)如图所示，$\dfrac{\sin\alpha}{\sin\theta}=n$ $\theta=30^\circ$ $\alpha=60^\circ$

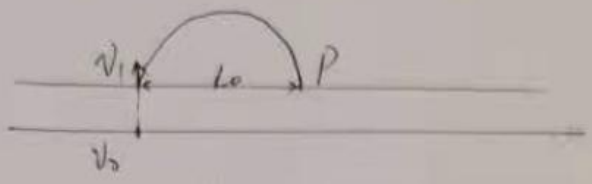
$$\frac{\sin\alpha}{\sin\beta}=n \quad \beta=30^\circ \quad \therefore PM=R\sin\beta=\frac{R}{2}$$

$$\tan 30^\circ=\frac{d}{h-\frac{R}{2}}$$

$$\therefore d=\frac{\sqrt{3}}{3}(h-\frac{R}{2})$$



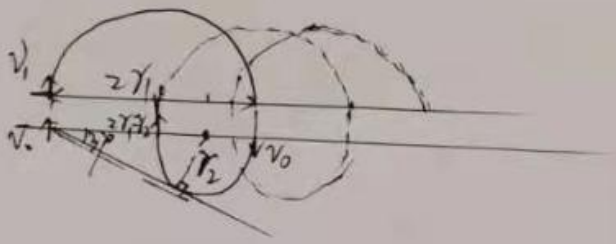
河北卷 14题



(1) $\begin{cases} qU_0 = \frac{1}{2}mv_1^2 - \frac{1}{2}mv_0^2 \cdots ① \\ qv_1B = m\frac{v_1^2}{r} \cdots ② \\ L_0 = 2r \cdots ③ \end{cases}$

联立可得 $U_0 = \frac{qB^2L_0^2}{8m} - \frac{mv_0^2}{2q}$ ··· (1)

(2)



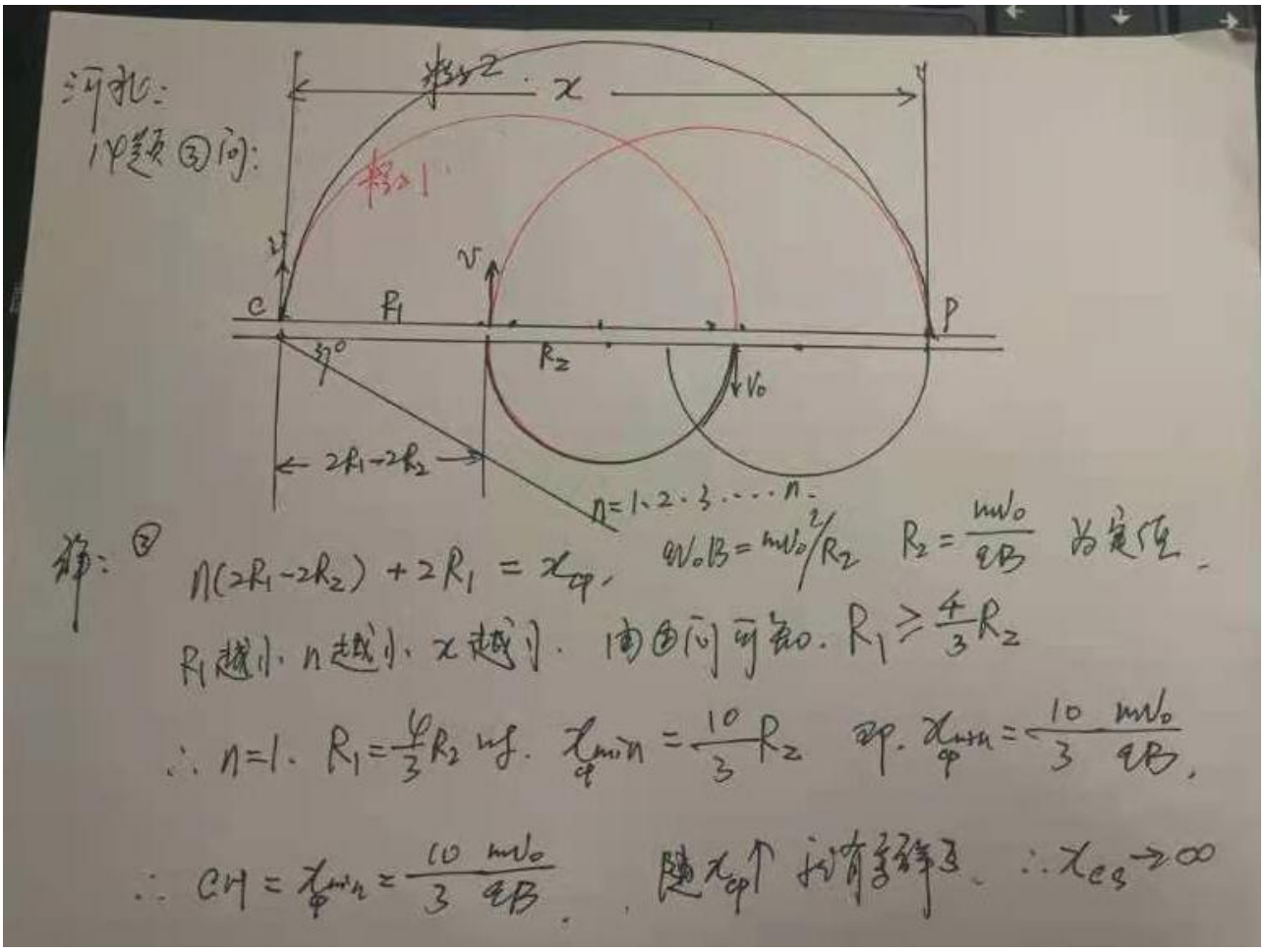
$qU_{min} = \frac{1}{2}mv_1^2 - \frac{1}{2}mv_0^2 \cdots ⑥$

$qv_1B = \frac{mv_1^2}{r_1} \cdots ⑦$

$qv_0B = \frac{mv_0^2}{r_2} \cdots ⑧$

几何关系 $\sin 30^\circ = \frac{r_2}{2r_1 - r_2} \cdots ⑨$

联立⑥~⑨得 $U_{min} = \frac{7mv_0^2}{18q}$ ··· (2)



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