选择题

1 [A] [D] [C] [redacted]
2 [A] [redacted] [C] [D]
3 [A] [D] [C] [redacted]
4 [A] [D] [redacted] [D]
5 [redacted] [D] [C] [D]
6 [A] [D] [C] [redacted]
7 [A] [redacted] [C] [D]
8 [redacted] [D] [C] [D]
9 [A] [redacted] [C] [redacted]
10 [A] [D] [redacted] [D]

[redacted]

非选择题

11.（6分）

（1）___>___（2分）　（2）垂直___（2分）

（3）$m_B x_1 = m_A x_2 + m_B x_3$（2分）

12.（10分）

（1）___>___（2分）

（2）变小（2分）　变大（2分）　$\frac{U_1 - U_2}{I_2 - I_1}$（2分）

（3）R_0（2分）

13.（10分）

角平分线，由运动学得：

$$\frac{mg}{qE} = \tan 37^\circ = \frac{\sin 37^\circ}{\cos 37^\circ}$$

$$\therefore qE = \frac{mg \times 0.8}{0.6} = \frac{4}{3}mg$$

$$E = \frac{4mg}{3q}$$

由：$mgL - qE \cdot L = 0 - \frac{1}{2}mv^2$

$$mgL - \frac{4mgL}{3} = -\frac{1}{2}mv^2$$

$$v^2 = \frac{2}{3}gL$$

$$\therefore v = \frac{\sqrt{6gL}}{3}$$

$$F_{拉} - mg = m\frac{v^2}{L}$$

$$F_{拉} = \frac{5}{3}mg$$

14. (14分)

解：(1). $F = kx = m_B a$.

$10x = 0.3 \times 2$

$x = 0.06m$

(2). $F = kx = m_A a'$

$a' = 1.2 m/s^2$.

~~$E_K = \frac{1}{2}$~~

$m_A v_A = (m_A + m_C) v'$

$v' = \frac{5}{6} v_A$.

$a''t = \frac{5}{6} a't$.

$\therefore a'' = 1 m/s^2$

$X = \frac{1}{2} a' t^2$.

$0.12 = 1.2 \times t^2 \quad t^2 = 10 s^2$

$E_K = \frac{1}{2} m_A v_A^2 - \frac{1}{2}(m_A + m_C) v'^2 + E_P$

$= \frac{1}{2} m_A (a't)^2 - \frac{1}{2}(m_A + m_C)(a''t)^2 + \frac{1}{2} k x^2$

$= \frac{1}{2} \times 0.5 \times 14.4 - \frac{1}{2} \times 0.6 \times 10 + \frac{1}{2} \times 10 \times (0.06)$

$= 3.6 - 3 + 0.018$

$= 0.618 J$

15. (18分)

解：(1). $F - F_{安} = ma = 0$

$\therefore F_{安} = 2BIL = 2B \frac{2BLv}{R_0} \cdot L = \frac{4B^2L^2v}{R_0}$.

$\therefore F = \frac{4B^2L^2v}{R_0}$.

$v = \frac{F \cdot R_0}{4B^2L^2}$

(2). $-\sum BI\Delta t = 0 - mv$.

$2BLq = mv$

$q = \frac{mv}{2BL} = \frac{FmR_0}{8B^3L^3}$

$q = \frac{\Delta \Phi}{R_0} = \frac{B \times 2L \times x}{R_0} = \frac{Fm \cdot R_0}{8B^3L^3}$.

$\therefore x = \frac{mFR_0^2}{16B^4L^4}$

(3). $E = 2BLv = \frac{2FR_0}{2BL}$