1998 BR

Mech MC

10) $T = 2\pi\sqrt{\frac{l}{g}}$ $T_f = 2T$

$\frac{1}{\sqrt{g_f}} = 2$

$\sqrt{g_f} = \frac{1}{2}$ $g_f = \frac{1}{4}$ (a) ✓

9) ?

11) ~~$\frac{mv^2}{r}$~~ ~~$\omega = v$~~ I ✓ II ✓ III ✓ (e)

12) $J = \Delta p = F\Delta t = 10N(2s) - 10N(2s)$
$= 0$ (c) ✓

13) $mv + mv = (3m)v_f$
$v_f = \frac{2}{3}v$ (c) ✓

32) $\Sigma\tau = I\alpha$
$\omega_f = \omega_i + \alpha T$
$\alpha = \frac{\omega_c}{T}$
$\tau = \frac{I\omega_c}{T}$ (e) ✓

9) d

E/M MC

47) (e)? 52) c ✓

63) $W = \Delta U$

$\frac{kQq}{(r+R)}$ $\frac{kQq}{r} - \frac{kQq}{R}$

$\frac{kQq}{r}$ (b)

67) (b) 47) d 63) e 67) a

Mech FR

2) i) $\Delta KE = KE_f - KE_0 = \boxed{-\frac{1}{4}mv_0^2}$ +1

3) (ii) $\boxed{m_1}$ $F = 0$ ✓ +1

(v) $F_f \leftarrow \boxed{m_2}$ $F_f = M_g$ ✓ +1/2

E/M FR

1) b) The angle will be less b/c the conducting sphere allows the +1 charges to gather on the far end of the sphere away from A, +1 thus increasing the distance & decreasing the electrostatic force.

2) b) $\Delta V = I R_{eq}$

$I = \frac{\mathcal{E}}{R_{eq}} = \frac{20\ V}{(10\Omega + 20\Omega)} = 0.667\ A$ +1 +1

$V = IR = (0.667A)(10\Omega) = \boxed{6.67\ V}$ +1

d) $V_f = 0$; $I_0 = 0$ +2

f) ?

3) a) $\mathcal{E} = \frac{-d\Phi}{dt} = \frac{B \cdot dA}{dt} = \frac{B\ell \cdot dr}{dt}$

$= B\ell v$ +1

c) 0

2) f) $\mathcal{E} - I(R_1 + R_2) - L\frac{dI}{dt} = 0$ +1

3) d) $v(t) = \frac{mRg\sin\theta}{B^2\ell^2}\left(1 - e^{\frac{-B^2\ell^2 t}{mR}}\right)$ +1