00196423 Daniela Alejandra Perdomo Fermán

1 → TR = C

2 → TR = B

3 → TR = B

4 → TR = C

5 → TR = D

6 → TR = B

EJERCICIO #8

Datos:

masa por minuto = 800 kg

tiempo = 1m = 60s

Altura = 14m

Rapidez final = V = 18 m/s

(A) Trabajo en J

$W_g = mgh$

$W_g = (800\ kg)(9.8\ m/s^2)(14\ m) = 109.760\ J$

TR // 109.760 J

(B) Trabajo para energía cinetica

$W_K = \frac{1}{2} mv^2$

$W_K = \frac{1}{2} (800\ kg)(18\ m/s)^2 = 129.600\ J$

TR // 129.600 J

(C)

Trabajo total: $W_{total} = W_g + W_K$

$W_{total} = 109.760\ J + 129.600\ J$

$= 239.360\ J$

00196423 Daniela Alejandra Perdomo Fermán

EJERCICIO # 9:

Datos:

$m = 2\ kg$

$h = 3\ m$

$L = 1.5\ m$

$\mu_k = 0.250$

$k = 400\ N/m$

$g = 9.80\ m/s^2$

Ⓐ Rapidez de pista curva

$mgh = \frac{1}{2}mv^2 \Rightarrow v = \sqrt{2gh}$

$v = \sqrt{(2)(9.8)(3)}$

$v = \sqrt{58.8}$

TR = 7.67 m/s²

Ⓑ Trabajo de la fricción y energía residual

- Tramo horizontal $W = mg = (2)(9.8) = 19.6\ N$
- Fuerza de fricción $W_{fk} = -f_k \cdot L = -(\mu_k N)(L)$

$= -(0.250 \times 19.6\ N)(1.5\ m$

$= -7.355$

«Energía mecanica residual»

$E_{residual} = E_{inicial} + W_{fk} = (mgh) - 7.355 = 75.805 - 7.355 = 51.45J$

TR = 51.45 J

Ⓒ Compresión máxima (x_{max}) del resorte

$E_{residual} = \frac{1}{2}kx^2_{max}$ $\quad 51.45J = \frac{1}{2}(400\ N/m)\,x^2_{max}$

$51.45 = 200\,x^2_{max}$

$x^2_{max} = \frac{51.45}{200} = 0.25725$ $\quad$ TR = 50.7 cm

EJERCICIO #10:

Datos:

masa: 215 kg

fuerza: $Fx = t$

$t = 1.25\,s$, $Fx = 781.25\,N$

$$A = \frac{781.25}{1.5625} = 500\ N/s^2$$

↳ constante A: $Fx = At^2$

$$781.25 = A(1.25)^2$$

$$781.25 = 1.5625\,A$$

(A) Fuerza ejercida por motor

$$Fx\,(1.25) = 500\,(1.25)^2$$

R// 781.25 N

Constante $A = 500\ N/s^2$

(B) Impulso del cohete

$t_1 = 2s$ $t_2 = 3.5s$ $[\Delta t = 1.50s]$

$$I = \int_{t_1}^{t_2} Fx(t)\,dt = \int_2^{3.5} 500\,dt.$$

$$= \left[\frac{500}{3}t^3\right]_2^{3.5}$$

$$I = \frac{500}{3}(3.5^3 - 2^3) = \frac{500}{3}(42.875 - 8) = \frac{500}{3}(34.875)$$

R// = 5812.5 N.s

(C) Cambio de velocidad de cohete $\Delta(t)$

$$I = m\Delta v$$

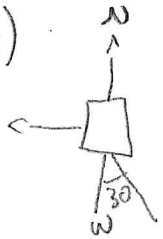
$$\Delta v = \frac{I}{m} = \frac{5812.5\ N \cdot s}{2150\ kg}$$

R// 2.7 m/s

00026124 Julissa Uriel Patiño Figueroa

Ejercicio	Respuesta
1	C
2	B
3	B
4	A
5	D
6	B

7) a)



b) $r = h \tan\beta$

$r = 0.800 \tan 30°$

$r = 46.19\ m$

c) $\omega_{max} = \sqrt{\dfrac{9.8 \sin 30° + 0.2 \cos^2 30°}{0.4619 \cos 30° - 0.2 \sin 30°}}$

$\omega max = 4.32\ rad$

8) a) $w_g = mgh$

$w_g = 800\,(9.8)(14)$

$w_g = 109760\ J$

b) $w_c = \frac{1}{2} mv^2$

$w_c = \frac{1}{2}\,(800)(18)^2$ $\quad w_c = 129600\ J$

c) $W_T = W_g + W_c$

$W_T = 109760 + 129600$

$W_T = 239360\ J$

$P = \frac{W_T}{t}$

$P = \frac{239360}{60}$

$P = 3.99\ Kw$

El energia necesaria para acelera el gua es 54.1% de trabajo

---

9) $mgh = \frac{1}{2} mv_B^2$

$v_B = \sqrt{2gh}$

$v_B = \sqrt{2(9.80)(300)}$

$V_B = 7.67\ m/s$

c) $E = mgh + W_f$

$E = (2)(9.80)(3) - 7.35$

$E = 51.45\ J$

b) $W_f = \mu_k mgl$

$W_f = -(0.250)(2)(9.80)(150)$

$W_f = -7.35\ J$

D) $E = \frac{1}{2} K x^2_{max}$

$51.4\ J = \frac{1}{2}(400) x^2_{max}$

$x_{max} = \sqrt{\frac{2(51.4\ J)}{400}}$

$x_{max} = 0.507\ m$

---

10) $781.25 = A(1.26)^4$

$A = \frac{781.25}{(1.26)^4}$

$A = 320\ N/s^4$

b) $J = \int_{2.00}^{3.50} f(t)\,dt$

$J = \int_{2.00}^{3.50} 320 t^4\,dt$

$J = \left[\frac{3.20 t^5}{5}\right] \Big|_{2.00}^{3.50}$

$J = 64\left[(3.50)^5 - (2.00)^5\right) \Rightarrow 31565.0\ Ns$

$J = 31565.0\ Ns$

c) $J = m\Delta v$

$\Delta v = \frac{J}{m}$

$\Delta v = \frac{31565}{2150}$

$\Delta v = 141.7\ m/s$

00063923 Carlos David Vasquez Martinez

1 - d

2 - b

3 - b

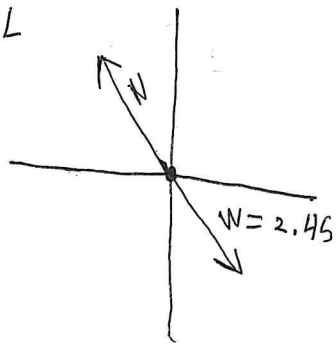
4 - c

5 - a

6 - c

7 - $m = 0.500\ Kg$
$\beta = 30.0°$
$\mu_s = 0.200$
$h = 0.800\ m$

a) DCL



b) R/ $w_y = mg \sin(\beta)$

$w_y = mg \sin(\beta)$

$w = 2.45$

c) $f_s = 0.200 \cdot 2.44$

$f_s = 0.49$ //

Carné: 00093224 Nombre: Andrea Berenice Miranda Mancias

1	d
2	b
3	b
4	b
5	d
6	d

1) Calculando la normal:

$n = mg$

$n = (5.00)(9.80)$

$n = 49$

Calculando f_k:

$f_k = (0.300)(49)$

$= 12\ N$

$12\ N < 20\ N$, el cuerpo está en reposo

$f_s = (0.500)(49)$

$= 24.5\ N$

2) La formas de energía que existen durante el movimiento son:

Sistema A: 1, 2 y 3 Sistema B: 1 y 2

Porque en el sistema A, al incluir la tierra la gravedad también afecta por lo que se utiliza la energía potencial gravitatoria.

---

8) Datos:

$m = 800\ kg/min$

$h = 14.0\ m$

$r = 18.0\ m/s$

a) $W = mgh$

$W = (800)(9.80)(14.0m)$

$= 109{,}760\ J/min$

b)

c) $P = mg \cdot \frac{h}{t}$

$= (800)(9.80) \cdot \frac{(14.0m)}{18.0m/s}$

$= 7840 \cdot (0.78)$

$= 6115.2\ KW$

---

a) $\frac{1}{2}mv_1^2 + mgy_1 + \frac{1}{2}kx_1^2 = \frac{1}{2}mv_2^2 + mgy_2 + \frac{1}{2}kx_2^2$

b) Trabajo realizado por la f_k

$f_k = (0.250)(n)$

$f_k = (0.250)(19.6)$

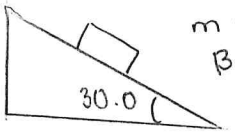
$f_k = 4.9\ N$

$n = mg$

$= (2.00kg)(9.80)$

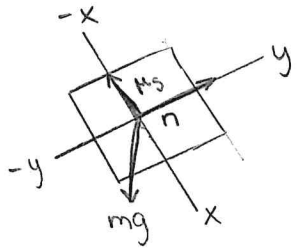
$= 19.6$

7) a) DCL del bloque



$m = 0.500\ kg$

$\beta = 30.0°$



b) ecuaciones de movimiento

1) $\sum F_x = ma$

$mg\cos(\beta) - MS = ma$

$(0.500)(\cos(30)) - 0.200 = 0.500\,a$

$(0.500)(0.866) - 0.200 = 0.500\,a$

$0.433 - 0.200 = 0.500\,a$

$0.233 = 0.500\,a$

$\frac{0.233}{0.500} = a$

2) $\sum F_y = 0$

$N\,Sen(\beta) = 0$

c) $0.466\ m/s = a$

---

10)

00152023 Joseph Rolando Garcia Escobar

1) c
2) b
3) b
4) a
5) D
6) b

7) b) $r = h\tan\theta$

$r = 0.800 \tan 30°$

$= 0.4619$

c) $\omega_{max} = \sqrt{\frac{9.8(\text{sen}\,30°) + 0.2[\cos 30°]}{0.4619\,(\cos 30° - 0.2\,\text{sen}\,30°)}}$

$= 4.32\ \text{rad/s}$

---

8) a) $w_g = mgh$

$= 800\ kg \times 9.8\ m/s^2 \cdot 14m$

$= 109\,760\ J$

b) $w = \frac{1}{2}mv^2$

$= 400\,(18)^2$

$= 129\,600\ J$

c) $w_6 = w_g + w_c$

$= 109{,}760 + 129{,}600$

$= 239{,}360\ J$

$P = \frac{w_6}{t} = \frac{239360}{60}$

$P = 3.99\ kw$

9) a) $y_i = 3 \quad y_f = 0$

$U_g = mg\,y_f - mg\,y_i$

$U_g = -2\,kg \cdot 9.8\,m/s^2 \cdot 3$

$= -58\,J$

$W_{other} = \Delta K + \Delta U_g$

$0 = \frac{1}{2}(2\,kg)v^2 + (-58\,J)$

$v = \sqrt{58}$

$= 7.61\,m/s$

b) $f_k = n \cdot \mu_k$

$= mg \cdot 0.250$

$= 2\,kg \cdot 9.8\,m/s^2 \cdot 0.250$

$= 4.9\,N$

$W_{other} = -f_k \cdot h$

$= -4.9 \cdot 1.5\,m$

$= -7.35\,J$

c) $W_{other} = \Delta K + U_g + U_{EI}$

$-7.35\,J = 7.61\,m/s\,x - 58\,J + \frac{1}{2}kx^2$

$200\,\frac{N}{m}x^2 + 7.61\,\frac{m}{s} - 50.38\,J = 0$

$x = 0.48\,m$

10) a)

$f(x) = A\ell^2 \qquad A = 500\,kg\,m$

$f(x) = 781.25\,N$

$= \frac{781.25\,N}{1.5625\,s^2} = A$

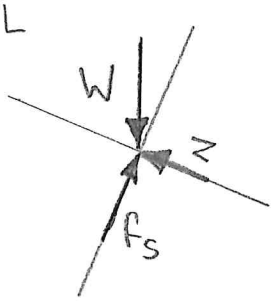
b) $\int_2^{3.5} 500\,\epsilon^2\,d\epsilon$

$500\,\frac{\epsilon^3}{3}\Big|_2^{3.5} = 5812\,J$

00186425 Lesly Margarita Mangandí Galdámez

1. a 2. b 3. b 4. a 5. c 6. d

(7) a) DCL



(8) a) $W = Fd$

$w = (800\,kg)(9.8\,m/s^2) = 7840\,N$

$W = (7840\,N)(14.0\,m) = 109,760\,J$

$\rightarrow \frac{109,760}{60} = 1829.33\,J$ por minuto

Rl = 1829.33 J por minuto

c) $P = F \cdot v$

$P = (7840N)(18\,m/s)$

$P = 141,120\,W$

Rl = La bomba desarrolla 141.12 KW

(9) a) $\Delta U = (2)(9.8)(3)$

$\Delta U = 58.8\ J \rightarrow$ Energía perdida

→ Trabajo por fricción:

$N = (2kg)(9.8 m/s^2) = 19.6\ N$

$f_K = (0.250)(19.6\ N) = 4.9\ N$

$W_f = -f_K d$

$W_f = -(4.9\ N)(3m)$

$W_f = -14.7\ J$

→ Energía disponible

$58.8 - 14.7 = 44.1\ J$

$\rightarrow K_f = \frac{1}{2} m v^2$

$44.1 = \frac{1}{2}(2) v^2$

$44.1 = v^2$

$\sqrt{44.1} = \sqrt{v^2}$

$6.64 m/s = v$

Rl: La rapidez del bloque fue de 6.64 m/s

b) $W_f = -f_K d$

$W_f = -(4.9N)(1.50m) = -7.35\ J$

Rl: El trabajo realizado por la fricción fue de -7.35 J.

00008325 Fernando mejía

1) d

2) b

3) b

4) a

5) d

6) b

00008325 Fernando mejia

8) a) $W = \vec{F} \cdot d \rightarrow (m)(g)(h) = (800)(14)(9.8)$

$W = 109.76 \times 10^3 J$

b) $W = \Delta K \quad W = Kf - Ki \quad W = \frac{1}{2}mv^2 \rightarrow W = \frac{1}{2}(800)(18)$

$W = 129600 J$

c) $P = (F)(v) \quad P = (800)(9.8)(18) = 141.12 \times 10^3 W$

9) a) $Ef = Ei$

$Kf = U_g$

$\frac{1}{2}mv_f^2 = mgh$

$\frac{1}{2}(2)v_f^2 = (2)(9.8)(3)$

$v_f = \sqrt{2 \times 9.8 \times 3}$

$v_f = 7.668 \, m/s$

b) $W = F \cdot d$

$Ff = \mu_k \cdot N$

$Ff = (0.250)(19.6)$

$Ff = 4.9 N$

$W_F = (4.9)(1.5)$

$W_F = 7.35 J$



$\sum F_y = 0$

$N = W$

10)

00 113124 Oscar Eduardo Mercado Guerra

(9) a) $mgh = \frac{1}{2}mv^2$ $v = \sqrt{2gh}$

a) $v = 7.67\ m/s$

b) $W_f = -f_k \cdot L$

b) $W_f = -7.35\ J$

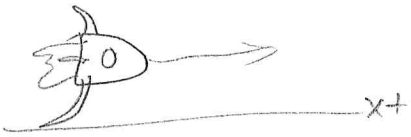
c) $\frac{1}{2}mv^2 + W_f = \frac{1}{2}kx^2_{max}$

Despejar x_{max}

c) $x_{max} = 0.528\ m$

---

(10)



$F_x = At^2$

a) $787.25 = A(1.25^2_s)$

$A = 500\ N/s^2$

$A = 500\ N/s^2$

b) $\int_2^{3.5} F_x$ Impulso $= 1537.25\ Ns$

c) $\Delta v = \frac{\text{Impulso}}{m}$ $\Delta v = 0.772\ m/s$

0 00084825 - Jorge Eduardo Vides Monterrosa

10-

a)

$781.25 = A(1.25)^2$

$A = \frac{781.25}{1.5625}$ $A = 500$

$A = 500\ N/s$

b) $J = \int_{1.5}^{2} 500t^2$

$\frac{500t^3}{3}\Big|_{1.5}^{2}$

$J = 770.8\overline{3}$

00084825 - Jorge Eduardo Vides Monterrosa

9-

$m = 2kg$

$h = 3m$

$L = 1.5m$ con $M_k = 0.250$

$K = 400\ N/m$

$g = 9.8\ m/s^2$

a)

$K_i + \cancel{E_i} + U_{gi} + \cancel{W_o} = K_f + \cancel{E_f} + U_{gf} + \cancel{W_{fx}}$

$2(9.8)(3) = \frac{1}{2}(2)V^2$

$58.8 = V^2$

$V = 7.67\ m/s$

b) W_{fx}

$W = 2 \cdot 9.8 = 19.6$

$N = 19.6$

$F_f = 19.6 \cdot 0.250$

$F_f = 4.9$

$W = F \cdot d \rightarrow 4.9 \cdot 1.5$

$W_f = 7.35\ J$

E_M Original:

58.8

E_M despues de W_f

58.8 - 7.35

Energía residual

51.45 J

c)

$51.45 = \frac{1}{2}(400)X^2$

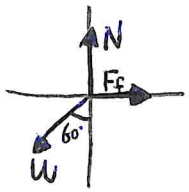
$X = \sqrt{\frac{2(51.45)}{400}} = 0.51m$

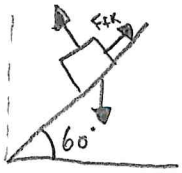
00084825 - Jorge Eduardo Vides Monterrosa

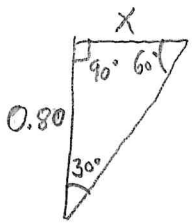
1.) d
2.) d
3.) b
4.) b
5.) a
6.) b

(7-)

a) DCL







$$\frac{0.80}{\text{sen}(60)} = \frac{X}{\text{sen}(30)} \qquad X = 0.46 = R_{\text{adio}}$$

b) Ecuación para velocidad maxima en curva peraltada con fricción:

$$V_{max} = \sqrt{g \cdot r \left(\frac{\tan\theta + \mu_s}{1 - \mu_s \tan\theta} \right)}$$

c) Rapidez maxima para lograrlo

$$V = \sqrt{(9.8)\cdot(0.46)\left(\frac{\tan(60) + 0.200}{1 - 0.200\tan(60)}\right)}$$

$$V_{max} = 3.65 \text{ m/s}$$