000 264 25 - ALFREDO ENRIQUE MORALES ESCOBAR

4 - C

2 - B

3 - B

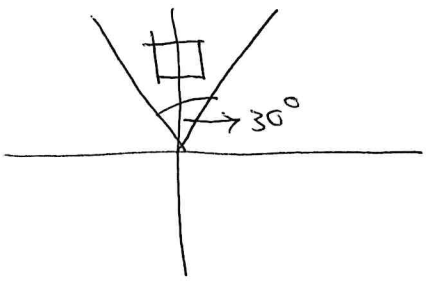
4 - A

5 - D

6 - B

$4 = r = h \tan\beta = 0.800 \tan(30.0) = 0.4649\ M)$

A)



B) ECUACIONES DE MOVIMIENTO

VERTICAL

$N \sin\beta - f_s \cos\beta - mg = 0$

RADIAL

$N \cos\beta + f_s \sin\beta = M\frac{v^2}{r}$

C) $\frac{v^2 M_r}{rg} = \frac{\cos 30^\circ + \mu_s \sin 30^\circ}{\sin 30^\circ \ \mu \cos 30^\circ} = \frac{0.866}{0.50}$

$v_{MAX} = \sqrt{2.95 \cdot 0.4619 \cdot 9.80} = 3.66\ M/S$

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8)

a) $W_g = mgh = 800\,kg \cdot 9.80\,m/s^2 \cdot 1.00\,m$

$109,760\,J$

b) $\Delta h = \frac{1}{2} mv = \frac{1}{2}(800\,kg \cdot (1.80)$

$129,600\,J$

c) $=D = \frac{W_{to} + \Delta C}{\Delta t} = \frac{109,760 + 129,600}{60} = 3989.33\,W$

$\downarrow$

$3.99\,kW/R$

9) a) $v = \sqrt{2gh} = \sqrt{2 \cdot 9.80 \cdot 3.00} = 7.67\,m/s$

b) $W_{Fx} = -F_K L = -\mu_K mgL = (10.256)(2.0kg)(9.80)(1.50)$

$= -4.35\,J/R$

ENERGIA RESIDUAL

$E_{MEC} = Mgh + W_{FK}\ (2.00)(9.80)(3.00) - 4.35 =$

$58.80 - 4.35 = 51.45\,J/R$

c) $\frac{1}{2} K x^2 \mu_K = 51.45 \Rightarrow x\mu x = \sqrt{\frac{2(51.45)}{400}}\ 51.45$

$0.504\,M$

ó

$50.4\,CM$

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10)

a) con $F_x = \Delta t^2$ en $t = 1.25$

$$481.25 = A(1.25)^2 \Rightarrow A = \frac{481.25}{1.5625} = 500\ N/s^2$$

b) $$J = \int_{2.00}^{3.50} 500 t^2\, dt = \left[\frac{500}{3} t^3\right]_{2.00}^{3.500} =$$

$$\frac{5.00}{3.00}(412.85 - 8)$$

$$5812.8\ N$$

$$5.81 \times 10^3\ N \cdot s$$

c)

$$\Delta v = \frac{J}{M}\ N = \frac{5812.5\ N \cdot s}{21.50} = 2.70\ m/s$$

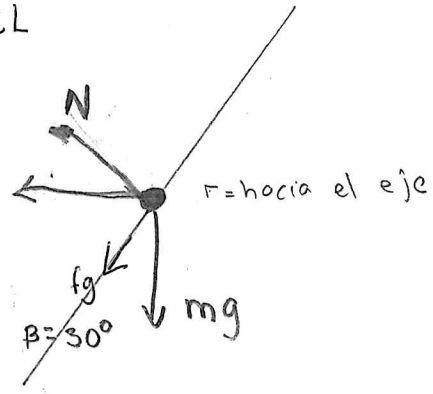
00114423 Jeshuor Joshau Rodriguez Vega

Respuestos de ejercicios 1-10

Preguntos	Respuestos
1	C
2	B
3	B
4	A
5	D
6	B

Ejercicio 7

A) DCL



Ejercicio 7

B) $r = h \tan\beta$

$r = 0.800 \tan 30°$

$r = 0.4619\ m$

c) $W_{max} \sqrt{\frac{9.80(\cos 30° + 0.200 \sin 30°)}{0.4619(\sin 30° - 0.200 \cos 30°)}}$

$W_{max} = 7.92\ rad/s$

Ejercicio 8

a) $W_g = mgh$

$W_g = (800)(9.8)(14)$

$W_g = 109760\ J$

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

$W_c = \frac{1}{2}(800)(18)^2$

$W_c = 129600\ J$

c) $W_T = W_g + W_c$

$W_T = 109760 + 129600$

$W_T = 239360\ J$

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

$P = 3.99\ kw$

D) $\frac{W_g}{W_T}(100) = 45.9\%$

$\frac{W_c}{W_T}(100) = 54.1$

$W_c > W_g$

La energia nesesaria para acelerar el agua representa el 54.1% del trabajo Total

Ejercicio 9

a) $mgh = \frac{1}{2} mv^2_B$

$v_B = \sqrt{2gh}$

$v_B = \sqrt{2(9.80)(3.00)}$

$v_B = 7.67\ m/s$

b) $W_f = \mu_k mgL$

$W_f = (0.250)(2)(9.80)(1.50)$

$W_f = -7.35\ J$

c) $E = mgh + W_f$

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

$E = 51.45\ J$

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

$51.45 = \frac{1}{2}(400)x^2_{max}$

$x_{max} = \sqrt{\frac{2(51.45)}{400}}$

$x_{max} = 0.507\ m$

Ejercicio 10

a) constante A

$781.25 = A(1.25)^4$

$A = \frac{781.25}{(1.25)^4}$

$A = 320\ N/s^4$

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

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

$J = \left[\frac{320t^5}{5}\right]_{2.00}^{3.50}$

$J = 64[(3.50)^5 - (2.00)^5]$

$J = 64(525.21875 - 32)$

$J = 31565.0\ Ns$

c) $J = m\Delta v$

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

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

$\Delta v = 14.7\ m/s$

00072525 Moisés Hernández Beltranena

(9) $m = 2\,kg$
reposo en punto A
$h = 3\,m$
pista curva sin fricción
$L = 1.50\,m$
$\mu_K = 0.250$
bloque choca y comprime
$K = 400\,\frac{N}{m}$

a) $K_1 + U = K_2 + U_2$

$mgy = \frac{1}{2} m v^2$

$\sqrt{2gy} = v$

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

R/ $7.67\,\frac{m}{s} = v$

b) $f_K = \mu_K N$

$f_K = \mu_K mg$

$f_K = (0.250)(2)(9.8)$

$f_K = 4.9\,N$

$W = -f_K \cdot L$

$W = (-4.9)(1.50)$

R/ $W = -7.35\,J$

$E_{residual} = E_i + W_{fK}$

$E_{residual} = mgh + (-7.35)$

$E_{residual} = (2)(9.8)(3) - 7.35$

R/ $E_{residual} = 51.45\,J$

c) $x_{max} = ?$

$E_{residual} = \frac{1}{2} K x^2$

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

$\sqrt{\frac{2(51.45)}{400}} = x_{max}$

R/ $0.507\,m = x_{max}$

---

(10) en $t = 0$
$m = 2150\,kg$
$F_x = At^2$
$781.25\,N$ cuando $t = 1.25\,s$
$A = ?$
$\vec{J} = ?$

a) $F_x = At^2$

$781.25 = A(1.25)^2$

$\frac{781.25}{(1.25)^2} = A$

R/ $500\,\frac{N}{s^2} = A$

b) $\vec{J} = \int_{t_1}^{t_f} F_x\,dt$

$\vec{J} = \int_{2.00}^{3.50} 500t^2\,dt$

R/ $\vec{J} = 5812.5\,N \cdot s$

2.00 + 1.5 / 3.5 s

c) $\vec{J} = m\Delta v$

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

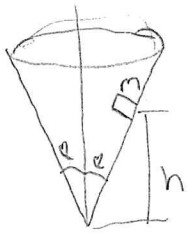
$\frac{5812.5}{2150} = \Delta v$

$2.70\,m/s = \Delta v$

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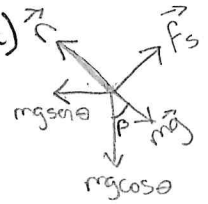
pregunta	Respuesta
1)	c
2)	b
3)	b
4)	c
5)	d
6)	b

(7) $m = 0.500\,kg$
$\beta = 30°$
$\mu_s = 0.200$
$h = 0.800\,m$



$a_c = \frac{v^2}{r}$

a)



b) en y

$\sum F_y = ma_y$

R/ $n\,sen\beta - f_s\cos\beta - mg = 0$

en x

$\sum F_x = ma_x$

R/ $n\cos\beta + f_s\,sen\beta = ma_c$

$n\cos\beta + f_s\,sen\beta = m\frac{v^2}{r}$

c) $f_s = \mu_s n$

$r = h\tan\beta$

$r = (0.800)\tan 30°$

$r = 0.46m$

$n\,sen\beta - \mu_s n\cos\beta = mg$ $\quad n(\cos\beta + \mu_s\,sen\beta) = m\frac{v^2}{r}$

$n(sen\beta - \mu_s\cos\beta) = mg$

$n = \frac{mg}{sen\beta - \mu_s\cos\beta}$

$\frac{v^2}{gr} = \frac{\cos\beta + \mu_s\,sen\beta}{sen\beta - \mu_s\cos\beta}$

$v = \sqrt{gr\,\frac{\cos\beta + \mu_s\,sen\beta}{sen\beta - \mu_s\cos\beta}} \rightarrow v = \sqrt{(9.8)(0.46)\,\frac{\cos 30 + 0.200\,sen\,30}{sen\,30 - 0.200\cos 30}}$

R/ $v = 3.65\,m/s$

---

(8) $m = 800\,kg$
$y = 14\,m$
$v = 18\,m/s$
por minuto = 60s

a) $W_{\substack{subir\\agua}} = mgy$

$W_{\substack{subir\\agua}} = (800)(9.8)(14)$

R/ $W_{\substack{subir\\agua}} = 109760\,J$

b) $W_{\substack{imparte\\K}} = \frac{1}{2}mv^2$

$W_{\substack{imparte\\K}} = \frac{1}{2}(800)(18)^2$

$W_{\substack{imparte\\K}} = 129600\,J$

$W_{total} = 109760 + 129600$
$= 239,360\,J$

c) $P = \frac{W_{total}}{\Delta t}$

$P = \frac{239360\,J}{60s}$

$P = 3989.33\,W$

R/ $P = 3.98\,KW$

d) Ambos trabajos son necesarios pero el más importante es el que se imparte K, porque es el que más necesita trabajo para lograr el objetivo planteado anteriormente

Ana Melissa Hernández Canales 00384225 hoja 2

9. $m = 2.00 kg$
punta $h = 3.00 m$
pista curva sin fricción
→ $L = 1.50 m$
horizontal
$\mu_x = 0.250$
resorte constante elástico = $k = 400 N/m$
$g = 9.80 m/s$

a) $mgh = \frac{1}{2} mv^2$ → despejar

$V_i = \sqrt{2gh}$

$V_i = \sqrt{2(9.8)(3.00m)} = 7.6681 m/s$

me quede sin mina...

b) $\mu mg = (0.250)(2.00)(9.80)$
$= 4.9 N$

$W_f = -F_f \cdot L = -(4.9)(1.50) = -7.35 J$

$mgh = (2.00)(9.8)(3.00) = 58.8 J$

$58.8 J - 7.35 J$
$= 51.45 J$

c) $x_{max} = \sqrt{\frac{51.45}{200}}$

$\frac{1}{2} k x^2_{max}$ → despejar $x_{max} = 0.5071$ compresión

10. $t = 0$
cohete $m =$ 2150 Kg
fuerza $= +x$
$F_x = At^2$
magnitud $= 781.25 N$
$t = 1.25$

a) $F_x = A(1.25)^2$

$781.25 N = A(1.5625)$

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

$A = 500 N/s^2$

b) $\int_{1.50}^{2.00} 500t^2$

$\int_{1.50}^{2.00} \frac{500t^3}{3}$

$\frac{500}{3} \int t^3$

$\frac{500}{3} \int (2.00)^3 - (1.50)^3$

$R = 770.83$

$R = 770.83 N \cdot s$

c) $\Delta V = \frac{J}{m} = \frac{770.83}{2150 kg} = 0.3585 m/s$

$= 0.3585 m/s$

~~[illegible]~~

Ana Melissa Hernández Canales 00387225 ~~examen~~ hoja 1

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

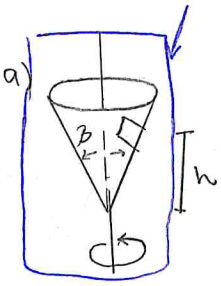
masa$_b$ = 5.00kg → reposo
F = 20.0N (derecha)
coeficiente de fricción = 0.500
estática entre el bloquee
y la superficie.
coeficiente de fricción cinetica = 0.300
¿magnitud de la fuerza de fricción?

¿Cuáles x y cuales y?



magnitud = $\sqrt{x^2 + y^2}$

7. a)



m_b = 0.500kg
$\beta = \theta = 30.0°$ (vertical)
fricción estática = μ_s = 0.200
h constante = 0.800m (vertical)

me quede sin minas

b) ¿Cuáles son las ecuaciones de movimiento?

$a_r = \frac{v^2}{r}$
$a_r = \omega^2 r$
$2\pi f$
} circular (circular)

$\vec{v}_{c/T} = \vec{v}_{c/m} + \vec{v}_m$ } relativo

c) ¿Cual es la rápidez máximo con lo que logra esto?

$r = h \tan\beta$
$r = (0.800)\tan(30.0)$
$r = 0.4618$

$v = \sqrt{(0.46188)(9.8)\left(\frac{\sin 30 + 0.200\cos 30}{\cos 30 - 0.200 \sin 30}\right)}$ ⟵

rápidez

$\frac{\sin\beta + \mu\cos\beta}{\cos\beta - \mu\sin\beta} = \frac{v^2}{rg}$ = despejar

$v_f = \sqrt{rg\left(\frac{\sin\beta + \mu\cos\beta}{\cos\beta - \mu\sin\beta}\right)}$

$V = \sqrt{(0.46188)(9.8)\left(\frac{\sin 30 + 0.200\cos 30}{\cos 30 - 0.200\sin 30}\right)}$

$V_{max} = 1.944 m/s$

8. $m_{agua} = 800 kg$
Altura del pozo = 14.0m
va subiendo
con una rápidez = 18.0 m/s

a) Por minuto ¿Cuánto tiempo en J se efectuará para subir el agua?

$W_K = \frac{1}{2}mv^2 = \frac{1}{2}(800)(18.0)^2$

1.29600

$W_{Total} = 109{,}760J + 129{,}600J = 239360$

$\frac{W_{Total}}{\tau} = \frac{239360}{60s} =$ 3989.33 J

1 minuto

c) ¿Que potencia en kW desarrolla la bomba?

b)

00773124 Oscar Eduardo Mercado Guerra

Mauricio es mi amigo

Respuestas

1: b

2: d, como en ambos hay un elastica resorte que gravitatoria cuelga y genera energía cinetica cinética.

3: b

4: b

5: d

6: d

Procedimientos:

⑦ $m = 0.500 kg$

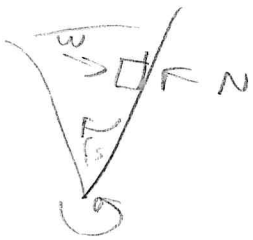
$\mu_s = 0.200$

$\beta = 30°$

$h = 0.8 m$

$r = 0.4619$

a) DCL



b) $\Sigma F_r = m\omega^2 r = N\sin\beta + f_s\cos\beta$

$\Sigma f_y = N\cos\beta - f_s\sin\beta - mg = 0$

c) $v_{max} = \sqrt{\frac{gr\sin\beta + \mu_s\cos\beta}{\cos\beta - \mu_s\sin\beta}}$

$v_{max} = \sqrt{\frac{9.8(0.4619)\sin(30) + 0.2\cos(30)}{\cos 30 - 0.2\sin 30}}$

$v_{max} = 1.78 m/s$

---

⑧ $W_g = mgh = 800(9.8)(14)$

$K = \frac{1}{2}mv^2 = \frac{1}{2}800(78)$

$P = \frac{W_g + K}{\Delta t}$

a) $W_g = 109,760 J/min$

b) $K = 129,600 J$

c) $P = 3.99 kW$

d) Se sabrá que el trabajo requerido es ligeramente mayor, así que se sabe que ambas fuerzas son necesarias.

Carnet: 00236724

Nombre: Camila Fernanda Parras Chicas

Parte de opción multiple:

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

Ejercicio 9:

a) Rapidez del bloque en el punto inferior de la rampa:

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

$gh = \frac{1}{2}v^2$

$2gh = v^2 \rightarrow 2(9.8)(3.0) = v^2$

$\sqrt{58.8} = \sqrt{v^2}$

$v = 7.668\ m/s$

b) Trabajo realizado por fk:

$fk = (0.25)(19.6)$

$fk = 4.9$

$N = mg$

$N = (1)(9.8) = 19.6$

c) Potencia elastica. Determinar compresión $x_{máx}$ que sufre el resorte cuando se extiende:

$Ue = \frac{1}{2}kx^2$

$Ue = \frac{1}{2}(400)(1.50)^2$

$Ue = 450$

Ejercicio 8:

a) Trabajo por min:

$U_g = mgh$

$U_g = (800)(9.8)(14)$

$U_g = 109760$

b) Trabajo que se efectua para impartirle la energía cinética que tiene que salir:

$W_{neto} = \frac{1}{2}mv^2$

$W = \frac{1}{2}(800)(18)^2$

$W = 129600$

c) potencia en kw

$P = Fv$

$P = (7840)(18)$

$P = 141120w \rightarrow kw \rightarrow 141.12kw$

Ejercicio 7:

c) rapidez máx

$$v^2max = g\frac{\sin\theta + M_s\cos\theta}{\cos\theta - M_s\sin\theta}$$

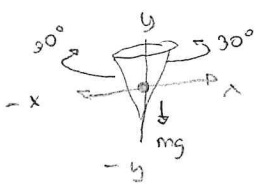
$$v^2max = (9.8)\frac{\sin 30° + (0.200)(\cos 30°}{\cos 30° - (0.200)\sin 30°}$$

$$= (9.8)(0.878)$$

$\sqrt{v^2max} = \sqrt{8.612}\ m/$

$v_{max} = 2.934\ m/s$

DLC



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7)

datos

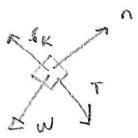
$m = 0.500\ kg$

$\beta = 30.0°$

$\mu_s = 0.200$

$h = 0.800\ m$

a)



b)

c) rápido

8) datos

$m = 800\ kg$ por min (210 gl/min)

$h = 14.0\ m$

$v = 18.0\ m/s$

$g = 9.80\ m/s^2$

a) $P = mv$

$P = (800\ kg)(18.0\ m/s)$

$P = 14,400\ W$

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

$t = \frac{7,840\ N}{14,400\ W}$

$t = 0.544$

* $w = mg$

$= (800\ kg)(9.8\ m/s^2)$

$= 7,840\ N$

$W = Pt$

$W = (14,400\ W)(0.544)$

$W = 7833.6\ J$

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9)

datos

$m = 2.00\,kg$

$h = 3.00\,m$

$v_i = 0\,m/s$

$L = 1.50\,m$

$K = 400\,N/m$

$g = 9.80\,m/s^2$

$\mu = 0.250$ $\quad W = (2)(9.8)$

b) Calcular W por $F_{fricción}$

$F_K = \mu_K n$

$n = m \cdot g$

$n = (2.00\,kg)(9.80\,m/s^2)$

$n = 19.60\,N$

$F_K = (0.250)(19.60\,N)$

$= 4.90\,N$

el trabajo realizado es de 4.90

2) $v = \sqrt{2gh}$ La rapidez es de 7.67 m/s

$v = 7.6681$

$v \approx 7.67\,m/s$

c) Calcular $x_{máx}$ (Compresión máxima)

$-F_K(d+x) = 0 - mg(d+x) + \frac{1}{2}Kx^2$

$\begin{cases} mg\,[N] \text{ (1)} \rightarrow 19.60\,N \\ \frac{1}{2}K\,[N] \text{ (2)} \rightarrow 200 \end{cases}$

(1) $(d+x) =$ (2) $\rightarrow$ cuadrática

1979.6
5,938.8

* Calcular $-F_K$ $\quad F_K = \mu K n$

$F_K = (0.250)(400)(19.6$

$F_K = 1,960\,N$

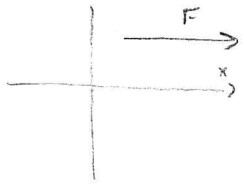
$\frac{1}{2}(400)x^2 - (19.60 - 1,960)x - (19.60 - 1960)(3) = 0$

$200x^2 + 1940.4x + 531 = 0$

$x = 0.28 \wedge 9.42$

$x_{máx} = 9.96\,m$

10)



datos

$m = 2,150\ kg \rightarrow t = 0\ s$

$F_x = At^2$

$= 781.25\ N \rightarrow t = 1.25\ s$

a) Calcular el valor de A

$F = At^2$

$\frac{F}{t^2} = A \Rightarrow A = \frac{781.25\ N}{(1.25\ s)^2}$ $\quad N = \frac{Kg \cdot s}{s}$

$A = 500\ Kg$

b) Impulso

$t_f = 1.500\ s$

$t_0 = 2.000\ s$

$\int_{t_0}^{x_f} At^2 \quad \int_2^{1.5} (500)t^2\,dt = -770.83\ J$

el impulso es de 770.83 J

c) ¿Cuánto cambia v? en $t_f = 1.500\ s$

$t_0 = 2.000\ s$

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1) C

2) B

3) B

4) A

5) D

6) B

00204125 Javier Gerardo Mangandt Izaguirre

1-) c
2-) b
3-) c
4-) a
5-) d
6-) b

9-) $m = 2kg$ $h = 3m$ $L = 1.50m$ $\mu_k = 0.250$

colisión y comprime a $k = 400 N/m$ $g = 9.8 m/s^2$

a) Considere tramo con fricción cero: $mgh = 58.8$

$mgh = \frac{mV^2}{2}$ $V^2 = 7.67 m/s$

b) Trabajo realizado por fuerza de fricción:

$W = f d \cos\theta$

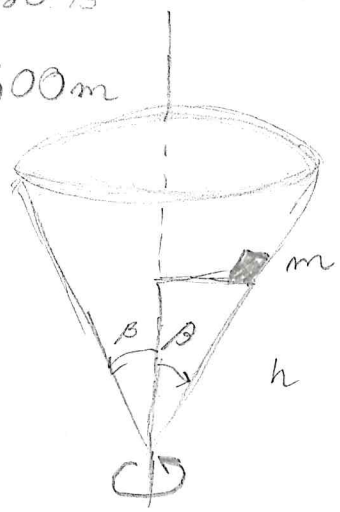
c) Compresión máxima al detenerse bloque por completo:

$\vec{V}_{1f} - \vec{V}_{2f} = \vec{V}_{2i} - \vec{V}_{1i}$

00204125 Javier Gerardo Mangandt Izaguirre

7.) Bloque de masa $= 0.500\,kg$ $g = 9.8\,m/s^2$

$\mu_s = 0.200$ $\beta = 30°$ $h = 0.800\,m$



$N = mg$ $f_s = \mu_s N$

$N = (0.5)(9.8)$ $\boxed{f_s = 0.98}$

$\boxed{N = 4.9}$

b) $a_R = \frac{v^2}{R}$ $mgh = 3.92$

8.) $Agua = 800\,kg$ $h = 14\,m$ $v = 18\,m/s$ $g = 9.8\,m/s^2$

$F = (800)(9.8)$ $W = mgh$ $\Delta h =$

$F = 7840\,N$

10.) Cohete en $t = 0$, Enciende, peso $2150\,kg$

$F_x = At^2$ $781.25\,N$ cuando $t = 1.25\,s$

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

$A = \frac{781.25}{(1.25)^2} = 500$

$A = 500\ SI$

b) $F = (500)(2.00)^2$

$F = 2000\,N$ ó $1125\,N$ con $1.5\,s$

c) Cambia a una razon del doble de su tiempo

001055.24 María Belén López Rodríguez.

1. B
2. B
3. C
4. B
5. D
6. B

8. $m = 800\ kg$
$d = 14.0\ m$
$v = 18.0\ m/s$

a) $F_{media} = mv_f - mv_i$

$= (800)(18.0) - 0$

$F_{media} = 14400$

$J = F_{media}\ \Delta t$

$J = 14400(60)$

$J = 864000\ J$

b) $W = \frac{1}{2} mv_f^2 - \frac{1}{2} mv_i^2$

$W = \frac{1}{2} (800)(18)^2 - 0$

$W = 129600\ J$

9. $m = 2.00\,kg$

$h = 3.00\,m$

$L = 1.50\,m$

$\mu_K = 0.250$

$k = 400\,N/m$

$g = 9.80$

a) $v^2 = v_0^2 + 2ah$

$N = mg$

$N = (2.0)(9.80)$

$N = 19.6\,N$

$N - mg = ma$

$\frac{N - mg}{m} = a$

$N - g = a$

$(19.6) - (9.8) = a$

$9.8 = a$

$v^2 = v_0^2 + 2ah$

$v^2 = 2(9.8)(3.00)$

$v^2 = 58.8$

$v = \sqrt{58.8}$

$v = 7.66\,m/s$

b) $f_K = \mu_K N$

$f_K = (0.25)(19.6)$

$f_K = 4.9$

$W_f = -f_K d$

$= -(4.9)(1.50)$

$W_f = -7.35\,J$

c) $U_S = \frac{1}{2} k x^2$

$U_S = \frac{1}{2}(400)(1.5)^2$

$U_S = 450\,J$

10. $t = 0$

$m = 2150\,kg$

$+ \longrightarrow$

$F_x = At^2$

$F = 781.25\,N$

$t = 1.25\,s$

a) $F_x = At^2$

$\frac{F_x}{t^2} = A$

$\frac{781.25\,N}{(1.25)^2} = A$

$500\,N/s = A$

c) $F = ma$

$\frac{F}{m} = a$

$\frac{781.25}{2150} = a$

$0.363\,m/s^2 = a$

$v = v_0 + at$

$v = at$

$v = (0.363)(3.5)$

$v = 1.27\,m/s$

00059025 Ashley Michelle Santamaria Godoy

1. C 2. b 3. b 4. a 5. d

6. b

8. Datos:

$m = 800\,Kg$
$h = 14\,m$
$v = 18\,m/s$
$g = 9.8\,m/s^2$
$t = 60\,s$

a) $W_1 = m \cdot g \cdot h$
$= (800)(9.8)(14.0)$
$= 109,760\,J$

b) $W_2 = \frac{1}{2}mv^2$
$W_2 = \frac{1}{2}(800)(18)^2$
$W_2 = 129,600\,J$

c) $P = \frac{W_1 + W_2}{t}$
$= \frac{109,760 + 129,600}{60}$
$= 3989\,W$
$P = 3.99\,KW \approx 4\,KW$

d) $\frac{W_1}{W_{TOTAL}} = \frac{109,760}{239,360} = 4.58\%$

$\frac{W_2}{W_{TOTAL}} = \frac{129,600}{239,360} = 5.41\%$

9. Datos:

$m = 2\,Kg$
$h = 3\,m$
$L = 1.5\,m$
$\mu_K = 0.250$
$K = 400\,N/m$
$g = 9.80\,m/s^2$

a) $m \cdot g \cdot h = \frac{1}{2}mv^2$
$v = \sqrt{(2gh)} = 7.67\,m/s$

b) $W_f = -\mu_K \cdot mg \cdot L = -(0.250)(2)(9.8)(1.50)$
$W_f = -7.35\,J$
$E_i = m \cdot g\,h = (2)(9.8)(3) = 58.8\,J$
$E_{res} = E_i + W_f \Rightarrow 58.8 - 7.35 \Rightarrow 51.5\,J$

c) $\frac{1}{2}K x_{max}^2 = E_{res}$
$x_{max}^2 = \sqrt{\frac{2E_{res}}{K}} = \sqrt{\frac{2(51.5)}{400}} = 0.507\,m$

10. Datos:

$m = 2{,}150\ Kg$

$F_x = At^2$

a) $A = \frac{F_x}{t^2} = \frac{781.25\ N}{(1.25)^2} = 500\ N/s^2$

$t = 1.25\ s$

b) $J = \int_2^{3.5} 500t^2\,dt$

$= 500\frac{t^2}{3}\,2^{3.5}$

$= \frac{500}{3}(3.5^3 - 2^3)$

$= \frac{500}{3}(42.875 - 8)$

$J = 5.81 \times 10^3\ N.s$

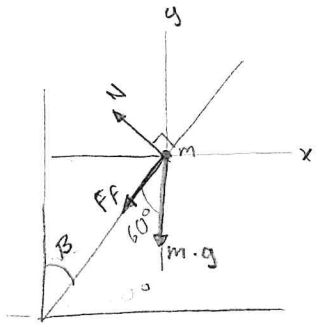
c) $J = \Delta p = m\Delta v$

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

$= \frac{5812.5}{2150}$

$\Delta v = 2.70\ m/s$

7. a) DCL



Datos:

$\beta = 30°$

$m = 0.500\ Kg$

$\mu_s = 0.200$

$h = 0.800\ m$

$g = 9.8\ m/s^2$

a) $V = h \cdot \tan\beta$

$= 0.800 \cdot \tan(30°)$

$V = 0.462\ m$

b) $\Sigma F_x \Rightarrow N\cos\beta + \mu_s N \operatorname{sen}\beta = mv^2/r$

$\Sigma F_y \Rightarrow N\operatorname{sen}\beta - \mu_s N\cos\beta - mg = 0$

$N = \frac{mg}{\operatorname{sen}\beta - \mu_s\cos\beta}$

$= \frac{4.90}{0.327} = 14.98$

$= 15.0\ N$

$F = \mu_s N$ $\quad F = (0.200)(15.0) = 300\ N$

c) $v = \sqrt{\frac{rN(\cos\beta + \mu_s \operatorname{sen}\beta}{m}} = \sqrt{\frac{(0.462)(15)(\cos 30°) + 2(\operatorname{Sen} 30°}{0.500}}$

$V_{max} = 3.66\ m/s^2$

RICARDO ALEXEI VALLE AVALOS - 00080525 #66 LISTA

00080525 - RICARDO ALEXEI VALLE AVALOS #66 LISTA

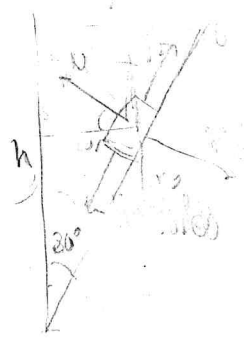
7.

$m = 0.5\ kg$

$\beta = 30.0°$

$\mu_s = 0.20$

$h = 0.80\ m$



$\Sigma F_y = 0$

$N\sin 30° - f_s \cos 30° = mg$

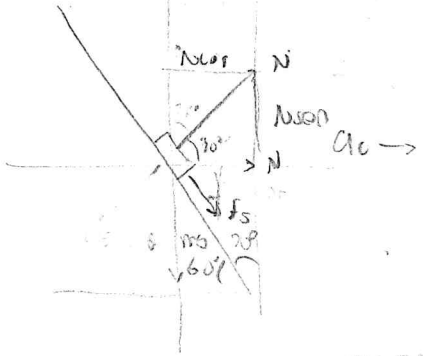
$\mu N(\sin 30° - \mu_s 30°) = mg$

$N = \frac{\quad}{mg\ 30}$

$N = \%\ N$

DLC

V_{max} = FRICCIÓN HACIA ABAJO



CALCULAR R

$\sin\theta = \frac{CO}{H} = \frac{r}{H}$

$r = H \cdot \sin 30°$

$r = 0.4\ m$

$\Sigma F_x = ma$

$N\cos 30° + f_s \sin 30° = m\frac{v^2}{r}$

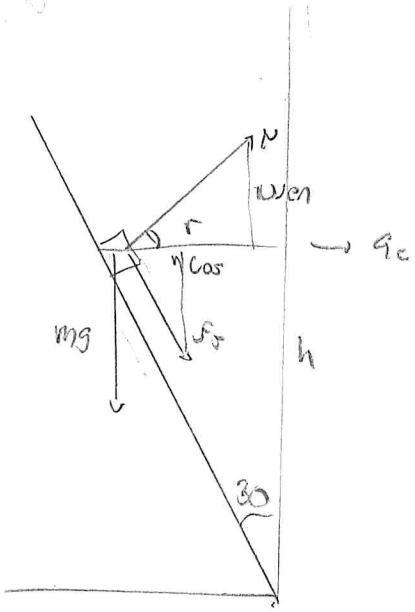
FCU II ÷ FCU I

$\frac{N(\cos 30° + \mu_s \sin 30°)}{N(\sin 30° - \mu_s \cos 30°)} = \frac{v^2}{rg}$

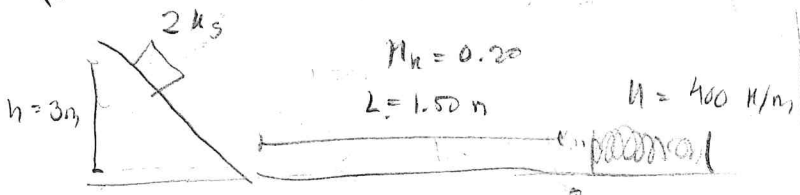
$v = \sqrt{rg\frac{1 + \mu \tan 30°}{\tan 30° - \mu_s}} \approx \boxed{V_{max} = 3.40\ m/s}$

7. $V_{max} = 3.40\ m/s$

DLC



9.



$m = 2\ kg$
$h = 3\ m$
$L = 1.5\ m$
$\mu_k = 0.250$
$k = 400\ N/m$
$g = 9.8$

$v_0 = 0$

$y = v_0 t + \frac{1}{2} g t^2$

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

$3 = 4.9 t^2$

$t = \sqrt{\frac{3}{4.9}}$

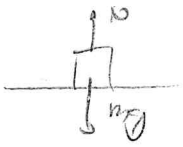
$t = 0.78\ s$

$v_f = v_0 + gt$

$v_f = (9.8)(0.78)$

$\boxed{v_f = 7.64\ m/s}$

TRABAJO REALIZADO POR LA FUERZA DE FRICCIÓN



$\Sigma F_y = 0$

$N = mg$

$N = 19.6\ N$

$f_k = \mu_k \cdot N$

$= (0.250)(19.6)$

$f_k = 4.9\ N$

$W_{fk} = -f_k \cdot d$

$= -(4.9)(1.5)$

$\boxed{W_{fk} = -7.35\ N}$

TRABAJO PESO

$W_p = mg\cos\theta \cdot d$

$W_p = (2)(9.8)(1)(1.5)$

$W_p = 29.4\ N$

$W_{NET} = 29.4 - 7.35$

$\boxed{W_{NET} = 22.05}$

$W = \frac{1}{2} m v_f^2 - \frac{1}{2} m (v_0)^2$

$22.05 = \frac{1}{2}(2) v_f^2 - \frac{1}{2}(2)(7.64)^2$

$22.05 = v_f^2 - 58.36$

$v_0 = \sqrt{80.41}$

$v_A = 8.96\ m/s$

$E_{MEC.INI} = \Delta K + U_g$

$E_{MEC.INI} = \frac{1}{2}(2)(8.96)^2 - \frac{1}{2}(2)(7.64)^2$

$\boxed{E_{MEC} = 18.37\ J}$

$U_E = \frac{1}{2} k x^2$

$W_{NET} = \frac{1}{2} k x^2$

$2 W_{NET} = k x^2$

$x_{MAX} = \sqrt{\frac{2 W_{NET}}{k}}$

$x_{MAX} = \sqrt{\frac{2(22.04)}{400}}$

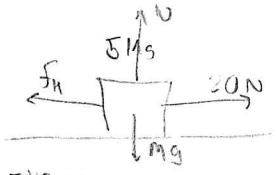
$x_{MAX} = 0.33\ m$

RICARDO ALEXEI VALLE AVALOS - 00080525 # 66 LISTA

00080525 - RICARDO ALEXEI VALLE AVALOS # 66 LISTA

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

1.



$m = 5.0$ kg
$F = 20$ N
$\mu_s = 0.50$
$\mu_k = 0.30$

$\Sigma F_y = 0$
$n = mg$
$n = (5)(9.8)$
$n = 49$ N

$f_{s\max} = \mu_s \cdot N$
$= (0.5)(49)$
$f_{s\max} = 24.5$ N

$f_s = 20$ N

20 N < 24.5 N

EL BLOQUE ESTA EN REPOSO

$f_k = 20$ N, REPOSO

2. SISTEMA A
BOLA + RESORTE + TIERRA
SISTEMA B
BOLA + RESORTE

CINETICA $K = \frac{1}{2} m v^2$
U_E $U_{EL} = \frac{1}{2} k x^2$
U_g $U_g = mgh$

- AMBOS SISTEMAS TIENEN U_E
- AMBOS TIENEN U_g

4. $E = K + U$
$12 = K + 9$
$K = 3$

A ^ V ^ J
VERDADERA

5. $F_{med} = \frac{\Delta P}{t}$ $J = F\Delta t = \Delta P$ $\Delta t = \frac{2}{\Delta v_d}$ $\Delta t = \frac{2}{10} = .5$

$m = 0.250$
$\Delta v_c = 30.0$ m/s
$\Delta v_d = 10.0$ m/s
$F_{max} = 200$ N

6.

