



Mi Universidad

Problematario

Nombre del Alumno: Daniela Miceli Sandoval

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Nombre del profesor: Juan José Ojeda Trujillo

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Física II

Problematario Parcial 1

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① $F = 30 \text{ N}$ $d = 60 \text{ cm}$ a) Trabajo b) T. mecánico @ 300°

a) $T = f \cdot d$
 $T = (30)(0.6)$
 $T = 18 \text{ J}$

b) $P = T \cos \theta$
 $F = 18 \cos 30$
 $F = 15.588$

$T = f \cdot d$
 $T = (15.588)(0.6)$
 $T = 9.353$

② $m = 25 \text{ kg}$ $d = 6.4 \text{ mt}$ Trabajo

$F = P = m \cdot g$
 $F = P = (25)(9.8)$
 $F = P = 245 \text{ N}$

$T = f \cdot d$
 $T = (245)(6.4)$
 $T = 1,568 \text{ J}$

③ $F = 3 \text{ N}$ $d = 12,00 \text{ cm}$ Trabajo

$T = f \cdot d$
 $T = (3)(12)$
 $T = 36 \text{ J}$

④ $m = 6000 \text{ kg}$ $d = 150 \text{ mt}$ $\theta = 200$ $M = 0.65$ a) Tensión b) Trabajo

$F = P = m \cdot g$
 $F = P = (6000)(9.8)$
 $F = P = 58,800 \text{ N}$

$T = f \cdot d$
 $T = (58,800)(150)$
 $T = 8,820,000 \text{ J}$

$T = F \cos \theta \cdot d$
 $T = (58,800)(0.93)(150)$
 $T = 8,137,130 \text{ J}$

⑤ $F = 12 \text{ N}$ $d = 7 \text{ mt}$ a) Trabajo en la misma dirección b) En dirección contraria.

a) $T = f \cdot d$
 $T = (12)(7)$
 $T = 84 \text{ J}$

b) $T = f \cdot d$
 $T = (12)(7)$
 $T = 84 \text{ J}$

⑥ $m = 50 \text{ kg}$ $d = 8 \text{ mt}$ a) Trabajo b) Trabajo del muelle.

a) $F = m \cdot g$
 $F = (50)(9.8)$
 $F = 490 \text{ N}$

$T = f \cdot d$
 $T = (490)(8)$
 $T = 3,920 \text{ J}$

→ El trabajo del muelle es el mismo.

⑦ $V = 10 \text{ dm}^3$ $d = 3 \text{ mt}$ Trabajo

$10 \text{ dm}^3 \rightarrow \frac{1^3 \text{ mt}}{10^3 \text{ dm}^3} = 0.01 \text{ mt}^3$
 $P = \rho \cdot V$
 $P = (1600)(0.01)$
 $P = 16 \text{ Kg}$

$T = F \cdot d$
 $T = (16 \text{ kg})(9.8)(3)$
 $T = 470.4 \text{ J}$

⑧ $m = 20 \text{ Ton}$ $F = 20000 \text{ N}$ $d = 36 \text{ km}$ Trabajo/km Trabajo/h

$F_{\text{compión}} = (20,000)(9.8)$
 $F_C = 1,960,000 \text{ N}$
 $F = 20,000 \text{ N}$
 $F_T = 1,980,000 \text{ N}$

$T = F \cdot d = (1,980,000 \text{ N})(36)$
 $T = 71,280,000 \text{ J}$

9) $m = 65 \text{ kg}$, $d = 10 \text{ mt}$, $F = 300 \text{ N}$, $d = 75 \text{ cm}$ Trabajo

$T = m \cdot g \cdot d$

$T_1 = (65 \text{ kg}) (9.81) (10 \text{ mt})$

$T_1 = 6376.5 \text{ J}$

$T_T = T_1 + T_2$

$T_T = 6376.5 + 225$

$T_T = 6601.5 \text{ J}$

$T_2 = (300 \text{ N}) (0.75 \text{ mt})$

$T_2 = 225 \text{ J}$

10) $F = 240 \text{ N}$, $d = 10 \text{ mt}$, θ a) 30° b) 90° c) 120°

$T = F \cdot d$

a) $T = T \cos \theta$

b) $T = T \cos \theta$

c) $T = T \cos \theta$

$T = (240) (10)$

$T = 240 \cos 30$

$T = 240 \cos 90$

$T = 240 \cos 120$

$T = 240 \text{ J}$

$T = (240) (10 \cdot 0.8)$

$T = (240) (10)$

$T = (240) (-0.5)$

$T = 192 \text{ J}$

$T = 0$

$T = -120 \text{ J}$

11) $m = 1500 \text{ kg}$, $d = 1500 \text{ cm}$, $t = 2 \text{ min}$ Hallar potencia en a) W b) Kw c) CV .

$F = m \cdot g$

$T = F \cdot d$

$F = (1500) (9.81)$

$T = (14,715) (15)$

$F = 14,715 \text{ N}$

$T = 220,725 \text{ J}$

$1 \text{ Kw} = 1.33 \text{ CV}$

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

$\text{Kw} = 1 \text{ Kw} = 1000 \text{ W}$

$1.839375 \text{ Kw} = 2.44686875 \text{ CV}$

$P = \frac{220,725}{120}$

$1.839375 \text{ Kw} = 1839.375 \text{ W}$

$P = 1,839.375 \text{ W}$

12) $v = 50 \text{ km/h}$, $p = 40 \text{ CV}$, $d = 50 \text{ km}$, $t = 3600 \text{ s}$ Fuerza

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

$F = \frac{T}{d}$

$T = P \cdot t$

$F = \frac{105,840,000}{50}$

$T = (29,400) (3,600)$

50

$T = 105,840,000 \text{ J}$

$F = 2,116,800 \text{ N}$

13) $m = 350 \text{ kg}$, $d = 18 \text{ mt}$, $t = 40 \text{ s}$ potencia en a) W b) Kw

$F = m \cdot g$

$T = F \cdot d$

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

$1 \text{ W} = 1000 \text{ Kw}$

$F = (350) (9.81)$

$T = (3433.5) (18)$

$P = \frac{61803}{40}$

$1545.075 = 1.545075 \text{ Kw}$

$F = 3,433.5 \text{ N}$

$T = 61,803 \text{ J}$

40

$P = 1545.075 \text{ W}$

14) $m = 2500 \text{ kg}$, $d = 1.6 \text{ mt}$, $t = 5 \text{ min}$ Potencia en CV

$F = m \cdot g$

$T = F \cdot d$

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

$F = (2500) (9.81)$

$T = (245,250) (1.600)$

$P = \frac{392,400,000}{300}$

$F = 245,250 \text{ N}$

$T = 392,400,000$

300

$P = 1,308,000 \text{ W}$

$1 \text{ CV} = 735 \text{ W}$

$1,779 \text{ CV} = 1,308,000 \text{ W}$

Problemario 1

15) $P=20\text{ cv}$ $v=50\text{ mt/min}$ $d=50\text{ mt}$ $t=60\text{ s}$ Hallar: Carga.

$$P = \frac{F \cdot d}{t}$$

$$T = P \cdot t$$

$$T = (20)(60)$$

$$T = 1200 \text{ J}$$

$$F = \frac{T}{d}$$

$$F = \frac{1200}{50}$$

$$F = 24 \text{ N}$$

$$P = F \cdot v$$

$$P = 24 \cdot 50$$

$$P = 1200 \text{ W}$$

16) $P=6\text{ cv}$ $v=25\text{ km/h}$ $M=0.2$ Hallar: peso.

$$P = \frac{F \cdot d}{t}$$

$$T = P \cdot t$$

$$T = (6)(3600)$$

$$T = 21600 \text{ J}$$

$$F = \frac{T}{d}$$

$$F = \frac{21600}{25000}$$

$$F = 0.864 \text{ N}$$

$$P = F \cdot v$$

$$P = 0.864 \cdot 25$$

$$P = 21.6 \text{ W}$$

17) $P=250\text{ kw}$ $m=1,000\text{ kg}$ Hallar: Velocidad

$$1\text{ cv} = 76\text{ kg mt/s}$$

$$1\text{ km} = 1.33\text{ cv}$$

$$P = 250\text{ kw} = 332.5\text{ cv}$$

$$P = 332.5\text{ cv} \cdot \frac{76\text{ kg mt/s}}{1\text{ cv}} = 25,270\text{ kg mt/s}$$

$$v = \frac{P}{m}$$

$$v = \frac{25,270}{1000}$$

$$v = 25.27\text{ m/s}$$

18) $m=1800$ $d=300\text{ mt}$ $t=3\text{ min}$ Hallar: potencia.

$$F = m \cdot g$$

$$F = (1800)(9.81)$$

$$F = 17,658\text{ N}$$

$$T = F \cdot d$$

$$T = (17,658)(300)$$

$$T = 5,297,400\text{ J}$$

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

$$P = \frac{5,297,400}{180}$$

$$P = 29,430\text{ W}$$

19) $m=130\text{ kg}$ $d=10\text{ mt}$ $t=2\text{ min}$ Hallar: potencia.

$$F = m \cdot g$$

$$F = (130)(9.81)$$

$$F = 1,275.3\text{ N}$$

$$T = F \cdot d$$

$$T = (1,275.3)(10)$$

$$T = 12,753\text{ J}$$

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

$$P = \frac{12,753}{120}$$

$$P = 106.275\text{ W}$$

20) $F=1275.3$ $d=10\text{ mt}$ $t=60\text{ s}$ Hallar: potencia en cv.

$$T = F \cdot d$$

$$T = (1,275.3)(10)$$

$$T = 12,753\text{ J}$$

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

$$P = \frac{12,753}{60}$$

$$P = 212.55\text{ W}$$

$$1\text{ cv} = 735\text{ W}$$

$$P = 212.55\text{ W} \cdot \frac{1\text{ cv}}{735\text{ W}} = 289\text{ cv}$$

PROBLEMATARIO 1

21) $m = 2 \text{ kg}$ $h = 3 \text{ m}$ $g = 10 \text{ m/s}^2$ a) b)

a) $E_p = m \cdot g \cdot h$
 $E_p = (2 \text{ kg}) (10 \text{ m/s}^2) (3 \text{ m})$
 $E_p = 60 \text{ J}$

b) $F = m \cdot g$
 $(2 \text{ kg}) (10)$
 $F = 20$
 $F = 20 \times 3$
 $F = 60$

22) $m = 200 \text{ kg}$ $v = 30 \text{ m/s}$ $F = 500 \text{ N}$ $d = ?$

$E_c = \frac{m \cdot v^2}{2}$ $E_c = 90,000 \text{ J}$

23) $F = 12.5 \text{ kg}$ $d = 600 \text{ cm}$ $m = 250 \text{ kg}$ $v = ?$

$(12.5) (600) = 735.60 \text{ J}$

$E_c = \frac{m \cdot v^2}{2}$

$\sqrt{2E_c} \left(\frac{735.60}{250} \right)$

$F = m \cdot g$
 $F = (12.5) (9.81)$
 $F = 122.6 \text{ N}$

$E_c = 7 = 75 \text{ J}$
 $2E_c = m \cdot v^2$
 $\frac{2E_c}{m} = v^2$
 $v = \sqrt{\frac{2E_c}{m}}$

$v = \sqrt{\frac{4471.65}{250}}$

$v = \sqrt{5.886} = 2.42$
 $v = 2.42$

24) $E_c = ?$ $m = 6 \text{ gr}$ $v = 500 \text{ m/s}$

$E_c = ? = \frac{m \cdot v^2}{2}$ $E_c = 75,000$

25) $P = 3.6 \text{ N}$ $v = 13 \text{ m/seg}$ $E_c = ?$

$E_c = \frac{m \cdot v^2}{2}$

$P = m \cdot g$
 $\frac{P}{g} = m$

$\frac{(0.36) (13)}{2} = 30.42$

$\frac{3.6}{9.81} = 0.36$

26) $v = ?$ $m = 5 \text{ kg}$

$E_c = \frac{m \cdot v^2}{2}$

$E_c = 225 \text{ J}$
 $v = \sqrt{\frac{2E_c}{m}}$

$2E_c = m \cdot v^2$
 $2E_c = v^2$
 $\frac{m}{m}$

$v = \sqrt{90}$
 $v = 9.48$

$v = \sqrt{\frac{2E_c}{m}}$

27) $E_p = 3 \text{ kg}$ $h = 2.5 \text{ m}$

$E_p = m \cdot g \cdot h$

$E_p = (3) (9.81) (2.5) = 73.57$

PROBLEMAS 1

28) $m = 6 \text{ Kg}$ $EC = 80 \text{ J}$ $h = ?$

$$\frac{h \cdot mg}{m \cdot g} = h = \frac{80}{(6)(9.81)} = 1.36$$

29) $m = 5 \text{ Kg}$ $h = 10 \text{ m}$ $EP = 490.5 \text{ J}$

$$Ed = \frac{mv^2}{2} = mgh \quad EC = 490.5 \text{ J}$$

$$T = EC = EP$$