Science 122

Monday, January 16/17

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1. Return -> SA - Thermodynamics
2. Check -> Worksheet #64
3. SA - Electrochemistry: Wednesday
4. Exam Format
5. Exam Review

Physics 112

Monday, January 16/17

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1. Exam Review: Problem #7 - Work-Energy Theorem Problem
2. Check -> Worksheet - Frequency, Period and Wave Speed
3. SA - U4 - Waves - Thursday, Jan. 5/16
4. Exam Review - 84 Problems

Physics 112 - Exam Review: Problem #7 - Work-Energy Prob.
Monday, January 16/17

Work.

$W = F_{//} d$

* F -> single force

Work - Kinetic Energy Thm.

$W = \Delta E_K$

$W = Fd = \Delta E_K$

$= E_{Kf} - E_{Ki}$

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

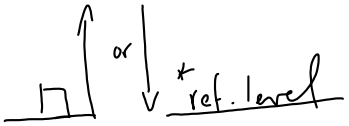
* motion -> horizontal

$Fd = E_{Kf} - \frac{1}{2}mv_i^2$

$Fd = \frac{1}{2}mv_f^2 - \frac{1}{2}mv_i^2$

$W = E_{Kf} - E_{Ki}$

Work - Gravitational Pot. Energy Thm



$W = \Delta E_g$

$W = Fd = \Delta E_g$

$mgd = E_{gf} - E_{gi}$

$= mgh_f - mgh_i$

W -> joule J
F -> newton N
d -> meter m
E -> joule J
m -> kilograms kg
v -> m/s
h -> m

Worksheet - Waves: f, T and V

$f = \frac{\#}{t}$, $f = \frac{1}{T}$

f → frequency (Hz)

$1\,Hz = \frac{1}{s}$ or s^{-1}

$v = \frac{d}{t}$ $v = \frac{\lambda}{T}$ $v = f\lambda$ ← universal wave equation

$\left[\frac{d}{t} = \frac{\lambda}{T}\right]$

$\left[\frac{d}{t} = \frac{\lambda}{T} = f\lambda\right]$

11. television station → electromagnetic wave

$f = 90\,MHz \times \frac{10^6\,Hz}{1\,MHz} = 90 \times 10^6\,Hz$

$\lambda = ?$

$v = c = 3.00 \times 10^8\,m/s$

$v = f\lambda$ ✓

$\lambda = \frac{v}{f}$ ✓

3. $f = 45$ rpm

a) $f = 45\,\frac{rev}{min} \times \frac{min}{60\,s}$

$f = 0.75\,Hz$ ← 25%

b) $T = \frac{1}{f}$

$T = \frac{1}{0.75\,Hz}$

$T = 1.3\,s$

4. $T = \frac{1}{f}$

$T_{new} = \frac{1}{3f}$

$T_{new} = \frac{1}{3}\left(\frac{1}{f}\right)$

$T_{new} = \frac{1}{3}T$

7. 

$\lambda = 4.0\,m$

$d = 8.6\,m$ ✓

$t = 5.0\,s$ ✓

$f = ?$

$v = \frac{d}{t}$

$v = $ ____ ← extra 5%

$v = f\lambda$

$f = $ ____

$v = \frac{d}{t} = f\lambda$

$f = $ ____

Physics 122

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1. Worksheet: Charge and Coulomb's Law
   Textbook - Page 638, #1-5
   Worksheet -> Textbook: C14 Page 646, #11-14
   Textbook: C14 Page 655, #20-24

2. Series Circuits - To Be Continued

3. Worksheet - Textbook: Page 719, #27-31

4. SA U3 - Electrostatics and Electric Circuits - Thursday

Series Circuits
Textbook: Page 719, C15 - PP#27-31

PRACTICE PROBLEMS

27. Three loads, connected in series to a battery, have resistances of 15.0 Ω, 24.0 Ω, and 36.0 Ω. If the current through the first load is 2.2A, calculate
    (a) the potential difference across each of the loads
    (b) the equivalent resistance for the three loads
    (c) the potential difference of the battery

28. Two loads, 25.0 Ω and 35.0 Ω, are connected in series. If the potential difference across the 25.0 Ω load is 65.0 V, calculate
    (a) the potential difference across the 35.0 Ω load
    (b) the potential difference of the battery

29. Two loads in series are connected to a 75.0 V battery. One of the loads is known to have a resistance of 48.0 Ω. You measure the potential difference across the 48.0 Ω load and find it is 40.0 V. Calculate the resistance of the second load.

30. Two loads, R_1 and R_2, are connected in series to a battery. The potential difference across R_1 is 56.0 V. The current measured at R_2 is 7.00 A. If R_2 is known to be 24.0 Ω, find
    (a) the resistance of R_1
    (b) the potential difference of the battery
    (c) the equivalent resistance of the circuit

31. A 240 V (2.40×10^2 V) power supply is connected to three loads in series. The current in the circuit is measured to be 1.50 A. The resistance of the first load is 42.0 Ω and the potential difference across the second load is 111 V. Calculate the resistance of the third load.

Answers

27. (a) 33 V, 53 V and 79 V respectively (b) 75 Ω (c) 1.6×10^2 V
28. (a) 91.0 V (b) 156 V
29. 42.0 Ω
30. (a) 8.00 Ω (b) 224 V (c) 32.0 Ω
31. 44.0 Ω

Science 10

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1. Assignment - Oh, What a Tangled Web
   - Due - Today: Monday, Jan. 16/17
2. Optional: Article Review - Indicator Species
   - Friday, Jan. 20/17
3. Biodiversity
4. Change and Stability in Ecosystems
5. DDT - Cats in Borneo
6. Bioaccumulation and Biomagnifcation
7. Sustainability
8. Last Assessment Before Exam! - Thursday.
9. Practice Exam