PRINCIPLES OF TECHNOLOGY
Chapter 3 Rate
Test Review

Name:_____

Period:_____

Work (review)

Linear vs. rotational (review)

Efficiency (review)

Speed

Velocity

Units for linear speed

Average speed vs. average velocity

Linear acceleration

Rotational (angular) speed

Units for rotational speed

Rotational (angular) acceleration

3.2 Rate in Fluid Systems

Hydraulic

Pneumatic

Common units of fluid rate

How does the diameter of a pipe affect the volume flow rate?

1. What are the formulas for fluid rate (volume and mass)? Solve equation for each variable.

Volume Flow Rate	Mass Flow Rate

2.

3.

4. Convert the above answer to gallons per second.

5. Convert 123.45 ft^2/min to in^2/sec.

6. The hydraulic pump on a bulldozer pumps 4.2 X 10^5 liters of fluid through the closed system during a 6.3-hour work period. Find the volume flow rate in liters per minute.

7. A river has an average depth of 5.21 feet and is 132.6 feet wide. How fast is the water moving if the volume flow rate of the river is 8,332 ft^3/sec?

3.3 Rate in an Electrical System

Electrical rate formula

Coulomb

Ampere

Ammeter

Voltmeter

Hertz

Cycle

Frequency (in words)

Frequency (formula)

Period (in words)

Period (formula)

Define the following variables:

I

t

q

f

T

Summarize the formulas and solve for each variable:

Electrical Rate	Frequency	Period

1. A wave is introduced into a thin wire held tight at each end. It has an amplitude of 3.8 cm, a frequency of 51.2 Hz and a distance from a crest to the neighboring trough of 12.8 cm. Determine the period of such a wave.

2. If a DC motor uses 775 coulombs of charge in 15 seconds, how much current is produced?

3. An AC motor operates at 11 amps for 6.5 min. How much charge flows through the motor?

3.4 Rate in Thermal System

Formula for heat flow rate

Specific heat

Calorie

BTU

Define the following variables:

T

k

A

1. Predict the effect of the following variations upon the rate at which heat is transferred through a rectangular object by filling in the blanks.

a. If the area through which heat is transferred is increased by a factor of 2, then the rate of heat transfer is _____ (increased, decreased) by a factor of _____ (number).

b. If the thickness of the material through which heat is transferred is increased by a factor of 2, then the rate of heat transfer is _____ by a factor of _____.

ALSO REVIEW EXAMPLES AND HOMEWORK FROM TEXTBOOK.