

$$27) f = 7.69 \times 10^{14} \text{ Hz}$$

$$E_{\text{photon}} = ?$$

$$E_{\text{photon}} = hf$$

$$E_{\text{photon}} = (6.63 \times 10^{-34} \text{ J}\cdot\text{s}) (7.69 \times 10^{14} \text{ Hz})$$

$$= 5.1 \times 10^{-19} \text{ J}$$

$$- 28) 3 \times 10^{-9} \text{ C} = q_{\text{TEST}}$$

$$E = \frac{F_e}{q}$$

$$F_e = 6 \times 10^{-5} \text{ N}$$

$$q$$

$$E = ?$$

$$= \frac{6 \times 10^{-5} \text{ N}}{3 \times 10^{-9} \text{ C}}$$

$$= 2 \times 10^4 \frac{\text{N}}{\text{C}}$$

$$= 2 \times 10^4 \frac{\text{N}}{\text{C}}$$

29) All waves transfer energy

LIGHT WAVES DO NOT REQUIRE A MEDIUM
THEY TRAVEL THROUGH THE VACUUM OF
SPACE

LIGHT IS NOT A MECHANICAL WAVE IT IS
A TRANSVERSE ELECTROMAGNETIC WAVE

30) Magnetic field and a conductor with
relative motion produces a voltage

$$31) \lambda = ?$$

$$f = 2.5 \text{ kHz} = 2500 \text{ Hz}$$

$$v = 326 \text{ m/s}$$

$$v = f \lambda$$

↓

$$\lambda = \frac{v}{f} = \frac{326 \text{ m/s}}{2500 \text{ s}^{-1}}$$

$$= .130 \text{ m}$$

32) JUST LIKE THE WINE GLASS AND GALLOPING GEATIE \Rightarrow WHEN OBJECTS ARE FORCED TO VIBRATE AT A NATURAL FREQUENCY THE AMPLITUDE INCREASES TO A POINT WHERE THE OBJECT BREAKS

33) OBSERVER A HEARS THE SAME FREQUENCY \Rightarrow NO MOTION

OBSERVER B HEARS A LOWER FREQUENCY

$$\Rightarrow \overset{\leftarrow}{v} = f \lambda$$

↓ ↑

\Rightarrow LONGER WAVELENGTH
 \Rightarrow OBJECT IS MOVING AWAY FROM OBSERVER B

34) PERIOD IS TIME TO COMPLETE ONE WAVE

2 waves in 4s

$$\Rightarrow \frac{4\text{s}}{2} = 2\text{s}$$

35) DIFFRACTION IS BASED ON WAVELENGTH VS. SIZE OF OPENING

LONG λ DIFFRACT MORE

\Rightarrow SOUND DIFFRACTS MORE THAN LIGHT

\Rightarrow BASS " " " TREBLE

\Rightarrow RED " " " BLUE

36) 1) 1000 cm \Rightarrow 100 cm IN A METER STICK
 \Rightarrow 10 m LONG \Rightarrow ABOUT SIZE OF CLASSROOM LENGTH

2) 1000 dm \Rightarrow 10 dm IN A METER STICK
 \Rightarrow 100 m LONG \Rightarrow ABOUT SIZE OF FOOTBALL FIELD

3) 1000 km \Rightarrow

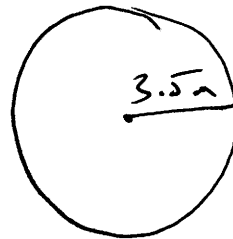
37) Radius = 3.5 m

$t = 8.9$ s

$v = ?$

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

$$= \frac{22 \text{ m}}{8.9 \text{ s}} = 2.47 \text{ m/s}$$



$$\begin{aligned} C &= 2\pi r \\ &= 2\pi(3.5) \\ &= 22 \text{ m} \end{aligned}$$