

SPH3U Chapter 12 Quiz (Quiz #6)

1. B

2. B

3. A

4. B

5. A

6. A

7. ~~The armature would rotate clockwise continuously.~~

7. There is first a rotational maximum force when the coil starts. As the coil moves, the momentum is reduced and the force decreases then finally, the coil stays vertically when there is no force.

8. i) The DC motor is costly because of the commutator and brush gear.

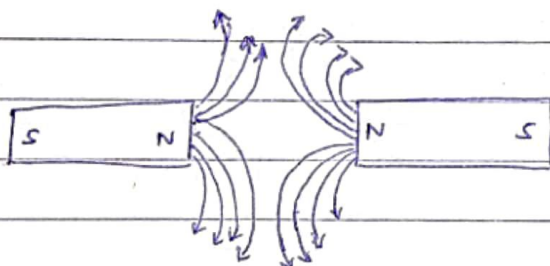
ii) DC motors require more maintenance.

9. $F = ILB \sin \theta$

$$= 10 \times 0.6 \times 0.2 \times \sin 90$$

$$= \underline{\underline{1.2 \text{ N}}}$$

10.



11. $F = ILB \sin \theta$

$$L = \frac{F}{IB \sin \theta}$$

$$L = \frac{5 \times 10^{-3}}{(3.45 \times 10^{-3}) \times \dots}$$

$$L = \frac{5 \times 10^{-3}}{\dots}$$

$$(500 \times 10^{-3}) \times (3.45 \times 10^{-3}) \times \sin 90$$

$$= \underline{\underline{2.899 \times 10^{-3} \text{ m}}}$$

12. a) Armature - The windings in which voltage induces

b) Commutator - The electric switch which converts AC to DC supply.

c) Field winding - The excitation system in which DC supply is given to it.
 It produces magnetic field.

d) Brushes and slip rings - They collect current from commutator to external circuit.

SPH30 Chapter 6 Quiz

1. Accounting for pushing the bin for 4m:

$$W = F \times d$$

$$= 175 \times 1$$

$$= \underline{\underline{175 \text{ J}}}$$

2. $KE = \frac{1}{2} m v^2$ $KE = \frac{1}{2} m v^2$

~~$KE_{\text{total}} = (\frac{1}{2} \times 50 \times 2.6^2) + (\frac{1}{2} \times 15 \times 2.6^2)$~~ $= \frac{1}{2} \times (50 + 15) \times 2.6^2$

~~$= 169 + 50.7$~~ $= \frac{1}{2} \times 65 \times 2.6^2$

~~$= \underline{\underline{219.7 \text{ J}}}$~~ $= \underline{\underline{219.7 \text{ J}}}$

3. $KE_{\text{inc}} = \frac{1}{2} m v_1^2 - \frac{1}{2} m v_2^2$

$= (\frac{1}{2} \times 65 \times 4.2^2) - (\frac{1}{2} \times 65 \times 1.75^2)$

$= 573.3 - 99.53$

$= \underline{\underline{473.77 \text{ J}}}$

4. The law of conservation of energy states that energy can neither be created nor destroyed but only transformed to different forms.

5. $\text{Efficiency} = \frac{\text{Input}}{\text{Output}} \times 100\%$

Output =

$\text{Input} = \frac{\text{Efficiency} \times \text{Output}}{100}$

$= \frac{55 \times 1600}{100}$

$= \underline{\underline{880 \text{ J}}}$

6. a) $\text{Energy} = \text{kWh}$

$= \frac{4000 \times 1.5}{1000 \times 60}$

$= 0.1 \text{ kWh}$

b) $\text{Efficiency} = \frac{\text{Input}}{\text{Output}} \times 100\%$

$\text{Output} = \frac{\text{Input} \times 100}{\text{Efficiency}}$

$= \frac{0.1 \times 100}{60}$

$= \underline{\underline{0.1667 \text{ J}}}$

7. $KE_1 + PE_1 = KE_2 + PE_2$ $KE = \frac{1}{2}mv^2$ $PE = mgh$

$$\left(\frac{1}{2} \times 1250 \times 1.17^2\right) + (1250 \times 9.8 \times 53.2) = \left(\frac{1}{2} \times 1250 \times v^2\right) + (1250 \times 9.8 \times 21.3)$$

$$625,555.56 = 625v^2 + 260,925$$

$$625v^2 = 364,630.56$$

$$v^2 = 583.4089$$

$$v = 24.15$$

$$= 24.15 \text{ m/s}$$

8. a) Solar energy
b) Wind energy
c) Geothermal energy
d) Hydroelectric energy

SPH3U Chapter 9 Quiz

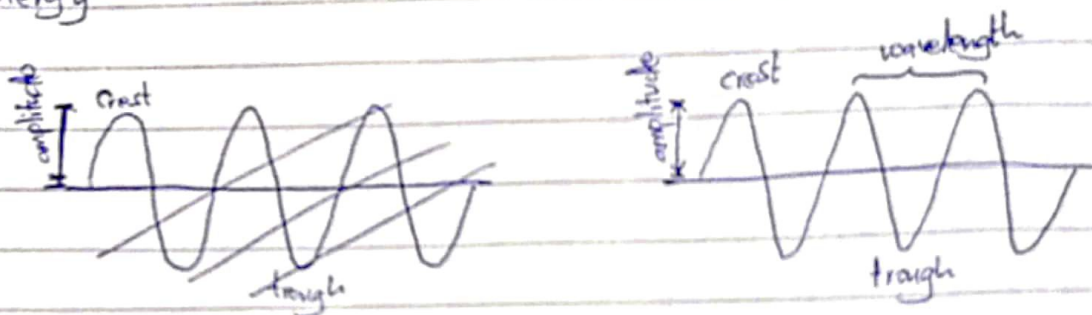
1. In a longitudinal wave, the propagation of energy is in the direction of the motion, while in a transverse wave, the propagation of energy is perpendicular to the direction of motion.

2. i) Crest and trough ~~in the medium~~

ii) Compression and rarefaction ~~in the medium~~

3. Energy

4.



5. $f = \frac{1}{T} = \frac{1}{6} = \underline{\underline{0.167 \text{ Hz}}}$

6. $\lambda = \frac{v}{f} = \frac{3 \times 10^8}{162.5 \times 1000}$
 $= \underline{\underline{2926.83 \text{ m}}}$

7. $f = \frac{v}{\lambda}$ finding velocity:

$5 \text{ m} = 9 \text{ s}$

$= \frac{5}{9} \text{ m/s} = 1 \text{ s}$

~~8/9~~

$f = \frac{5}{9} \div 9$

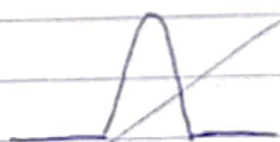
$f = \frac{5}{9} \times \frac{1}{9}$

$f = \underline{\underline{0.06173 \text{ Hz}}}$

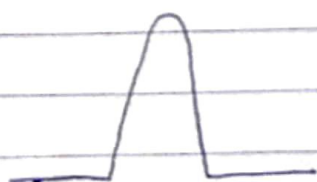
8.



Pulses move towards each other



~~Pulses interfere with one another~~

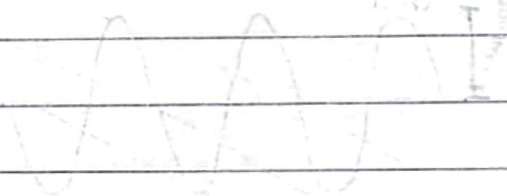


Pulses interfere with one another

9. Node - A point along a ~~standing~~ wave where the wave has minimum amplitude.

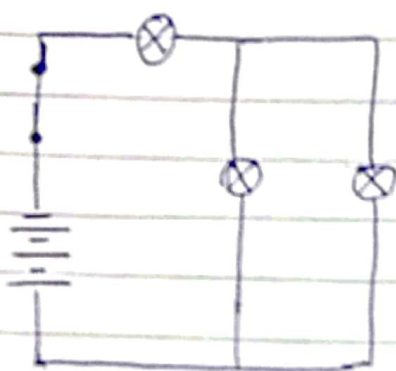
Antinode - A point along a wave where the wave has maximum amplitude.

Standing wave - A combination of 2 waves with same amplitude and frequency moving in opposite directions.

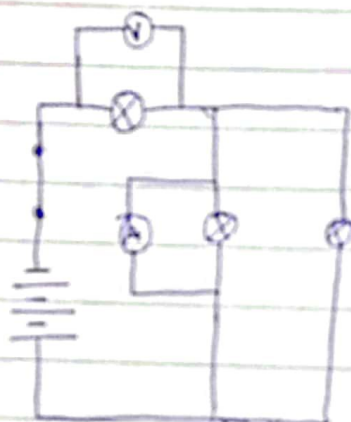


SPH3U (Chapter 11 Quiz (Quiz #5))

1. C
2. B
3. D
4. B
5. D
6. A
- 7.



8.



9)

$$\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2}$$

$$= \frac{1}{25} + \frac{1}{40}$$

$$\frac{1}{R_T} = \frac{13}{200}$$

$$R_T = \frac{200}{13} \quad R_T = \frac{15.38}{1} \quad \underline{\underline{15.38 \Omega}}$$

Potential difference is same \Rightarrow 6.0V

Current:

$$I = \frac{V}{R} \Rightarrow I_1 = \frac{6}{25} = \underline{\underline{0.24A}}$$

$$I_2 = \frac{6}{40} = \underline{\underline{0.15A}}$$

10. You calculate resistance by dividing voltage by current value.
The graph is demonstrating that current is directly related/proportional to voltage which is Ohm's law.

11. $R = \frac{V}{I}$

$$I$$

$$= \frac{50}{0.8} = \underline{\underline{62.5 \Omega}}$$

$$= 62.5 \Omega$$

