2014 wassce physics practical question paper

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2014 WASSCE Physics Practical Question Paper

Section A:

(a) Determination of the Velocity of Sound in Air

Question:

Use the resonance tube experiment to determine the velocity of sound in air at room temperature.

Materials:

- Resonance tube
- Tuning fork
- Water container
- Measuring cylinder
- Thermometer

Procedure:

1. Fill the resonance tube with water to about one-third of its height.
2. Strike the tuning fork and hold it vertically over the open end of the resonance tube.
3. Adjust the water level until you hear the maximum sound.

4. Measure the distance from the open end of the tube to the water level and record it as L.
5. Repeat steps 2-4 for different water levels.

Data:

Distance (L) (cm)	Frequency (f) (Hz)
15.0	512
20.0	512
25.0	512

Calculations:

Velocity of sound (v) = f * L

For the first measurement: v = 512 Hz * 0.15 m = 76.8 m/s

Repeat for the other measurements and calculate the average velocity.

Answer:

The velocity of sound in air at room temperature is approximately 76.8 m/s.

Section B:

(b) Determination of the Moment of Inertia of a Flywheel

Question:

Use the Atwood's machine to determine the moment of inertia of a flywheel.

Materials:

- Atwood's machine
- Flywheel
- Masses
- Stopwatch
- Meter stick

Procedure:

1. Suspend the flywheel from the spindle of the Atwood's machine.
2. Attach a mass m1 to one side of the Atwood's machine and a mass m2 to the other side.
3. Release the masses and record the time t taken for the masses to travel a distance h.
4. Repeat steps 1-3 for different masses m1 and m2.

Data:

m1 (kg)	m2 (kg)	h (m)	t (s)
0.1	0.1	0.5	1.0
0.15	0.1	0.5	1.1
0.2	0.1	0.5	1.2

Calculations:

Moment of inertia (I) = (m1 + m2) *g* t^2 / 4 * h

For the first measurement: I = (0.1 kg + 0.1 kg) *9.8 m/s^2* (1.0 s)^2 / 4 * 0.5 m = 0.0049 kgm^2

Repeat for the other measurements and calculate the average moment of inertia.

Answer:

The moment of inertia of the flywheel is approximately 0.0049 kgm^2.

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