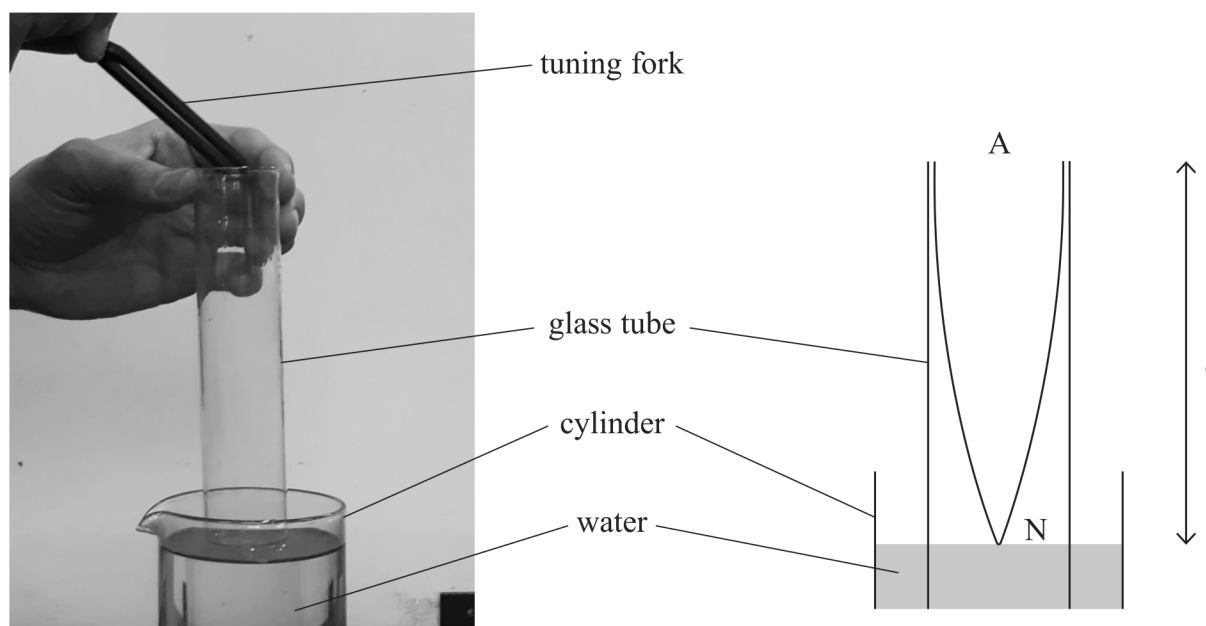


- 12 In an experiment to determine the speed of sound in air, a student held a vibrating tuning fork above a glass tube. The air column in the tube could be adjusted by raising or lowering the tube into a cylinder containing water. When the length of the air column was  $l$ , a stationary wave with one node and one antinode was produced as shown. This caused a sound to be heard.



- (a) Explain how the stationary wave was formed in this experiment.

(2)

- (b) (i) A sound was heard when  $l$  was 19.3 cm.

Determine a value for the speed of sound in air.

frequency of tuning fork = 440 Hz

(3)

Speed of sound in air = .....

- (ii) The antinode is slightly further from the water than the end of the glass tube.

Explain how this would affect the accuracy of your calculated value for the speed of sound.

(2)

(Total for Question 12 = 7 marks)