GCSE Physics A (Gateway)

J249/02 Physics A P5-P8 and P9 (Foundation Tier)

Question Set 4

1   A student watches a ball game on the school field.

The student sees the ball being hit with a bat but he hears the sound a short time after. This is because the speed of light is greater than the speed of sound.

He decides to do an experiment to measure the speed of sound waves in air.

(a)   Describe which measurements he needs to measure this speed. **[2]**

- He needs to measure the time taken between the ball being hit and hearing the sound.
- He also needs to measure the distance between where he is stood and the bat.

(b)   Which equation is used to calculate speed? **[1]**

$$speed = \frac{distance}{time}$$

(c)   Describe one way he could get valid results for this experiment. **[1]**

He could stand at different distances from the batter, have them hit the ball, measure the time taken to hear the sound. Use $speed = \frac{distance}{time}$ at each point to calculate speeds of sound, then take an average of the speeds.

Total Marks for Question Set 4: 4