## Section B

For Examiner's Use

Answer **all** the questions in the spaces provided.

**9** A metal wire strain gauge is firmly fixed across a crack in a wall, as shown in Fig. 9.1, so that the growth of the crack may be monitored.

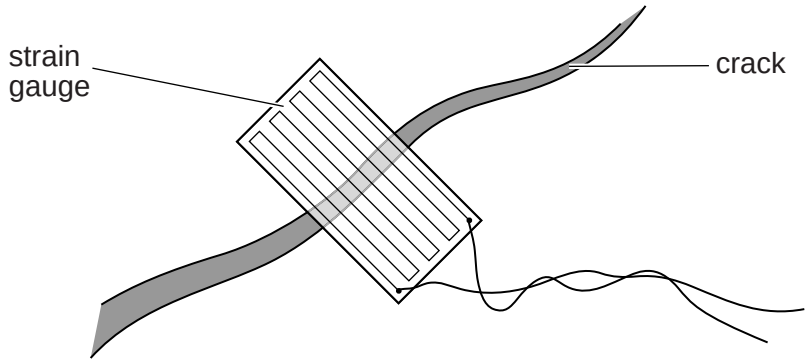


**Fig. 9.1**

**(a)** Explain why, as the crack becomes wider, the resistance of the strain gauge increases.

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..... [3]

**(b)** The strain gauge has an initial resistance of 143.0 Ω and, after being fixed in position across the crack for several weeks, the resistance is found to be 146.2 Ω.

The change in the area of cross-section of the strain gauge wire is negligible.

Calculate the percentage increase in the width of the crack. Explain your working.

increase = ..... % [3]