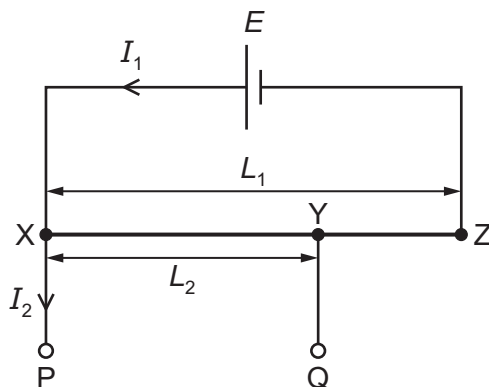


- 35** The diagram shows part of a circuit that uses a potentiometer wire to measure a potential difference (p.d.) in an external circuit.



The potentiometer wire XZ has length L_1 . It is connected to a cell of known electromotive force (e.m.f.) E that has negligible internal resistance.

Terminals P and Q are connected to the external p.d. to be measured. The length of the potentiometer wire between points X and Y is L_2 .

The ratio of the lengths L_1 and L_2 is used to determine the p.d. between P and Q in terms of E .

Which condition must be met in order to determine this p.d.?

- A** The current I_1 must be zero.
- B** The current I_2 must be zero.
- C** The p.d. across YZ must be zero.
- D** The resistance of the external circuit must be zero.