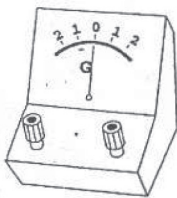
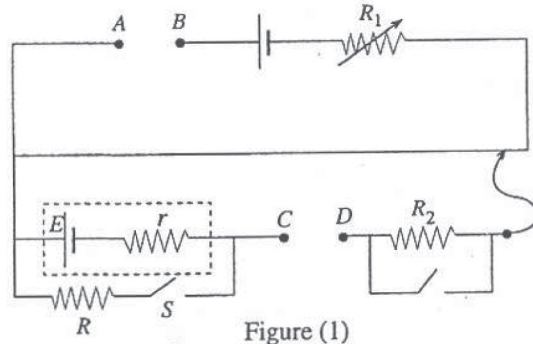


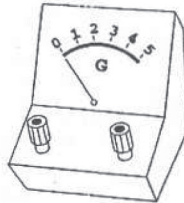
2012 A/L Structured Essay Question No (04)

4. Figure (1) shows an incomplete diagram of a potentiometer arrangement used for measuring the internal resistance of a cell.

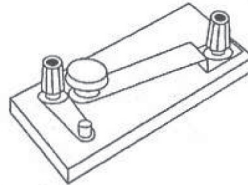
(a) In addition to the items corresponding to the symbols shown in figure (1), if you are provided with the items shown in figure (2) to perform this experiment,



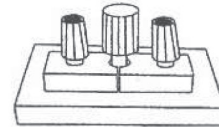
Item (1)



Item (2)



Item (3)



Item (4)

Figure (2)

- (i) which item would you connect between  $AB$ ? .....
- (ii) which item would you connect between  $CD$ ? .....

(b) In this experiment, after the apparatus is setup properly, two balance lengths must be taken. What are they?

- (i) .....
- (ii) .....

(c) If the balance lengths taken by a student were 90 cm and 80 cm, calculate  $r$ . (The value of  $R$  was  $5 \Omega$  during these measurements).

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(d) For maximum accuracy, the potentiometer must be adjusted so as to give largest possible values for the balance lengths.

- (i) Which of the two balance lengths mentioned in (b) above must be used for this adjustment? Give reasons for your answer.

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- (ii) With what item do you perform this adjustment?

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(e) If an  $R$  value much larger than  $5 \Omega$ , is used in the circuit when taking measurements under (b) above, would you expect a more accurate or less accurate value for  $r$ ? Give reasons for your answer.

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