5 Fig. 5.1 shows the I–V characteristics for two 12 V filament lamps A and B.

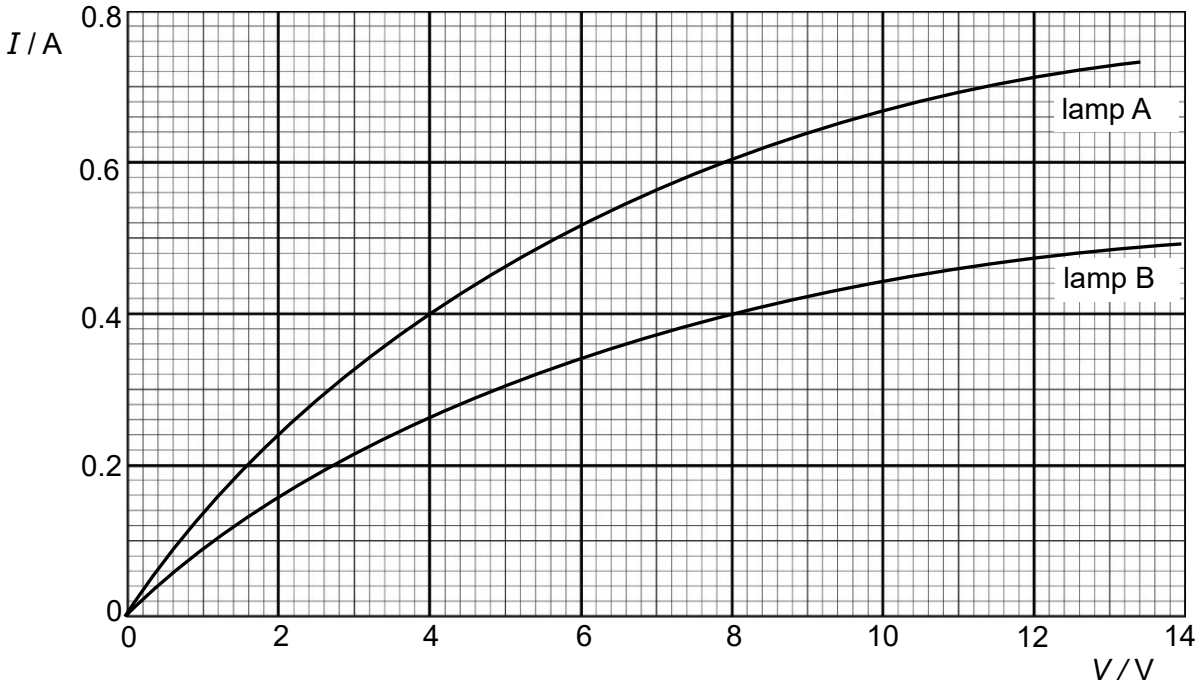

Fig. 5.1

(a) Explain the shape of the graph for filament lamp.

……

……[2]

(b) The two lamps are now connected in series with a 12 V battery with negligible internal resistance as shown in Fig. 5.2.

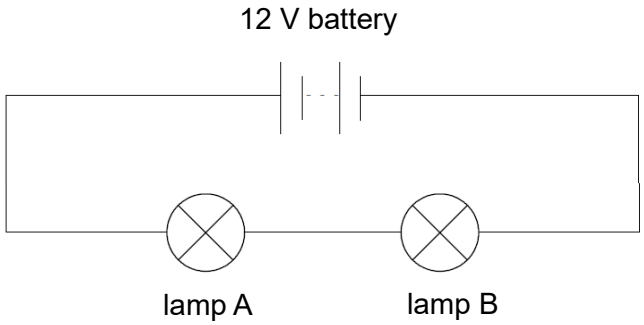

Fig. 5.2

(i) Use Fig. 5.1 to deduce the total current from the battery. Explain your deduction.

……

……

……[2]

(ii) Compare the power dissipated by the two lamps.

……

……

……[2]

(c) A uniform resistance wire XY of length 80 cm is connected to the circuit as shown in Fig.5.3.

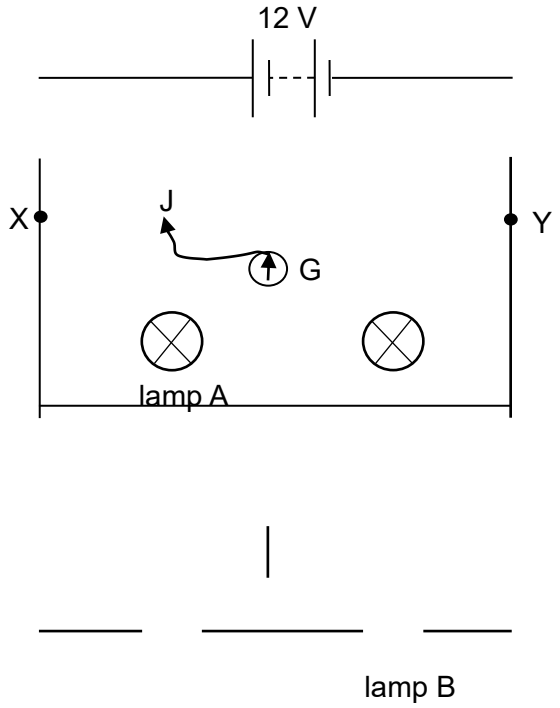

Fig. 5.3

The movable contact J can be connected to any point along the wire XY.

Calculate the length XJ required to produce zero current in the galvanometer G.

XJ = ……..m [2]

[Total: 8]