6 (a) The variation with potential difference V of the current I in a semiconductor diode is shown in Fig. 6.1.

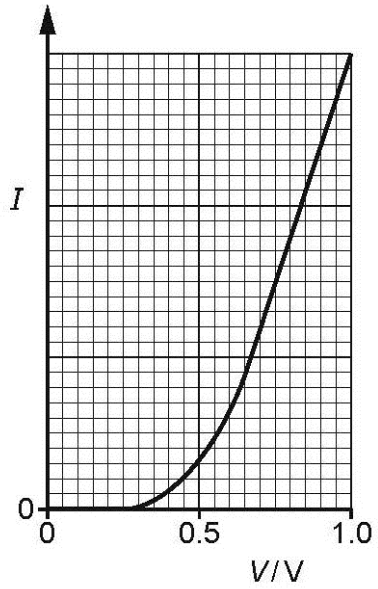

Fig. 6.1

Use Fig. 6.1 to describe qualitatively,

(i) the resistance of the diode in the range $V = 0$ to $V = 0.25$ V.

…… [1]

(ii) the variation, if any, in the resistance of the diode as V changes from $V = 0.75$ V to $V = 1.0$ V.

…… [1]

(b) A battery of electromotive force (e.m.f.) 9.0 V and negligible internal resistance is connected to a uniform resistance wire XY, a galvanometer, a light-dependent resistor (LDR) and a fixed resistor of 1200 Ω, as shown in Fig. 6.2.

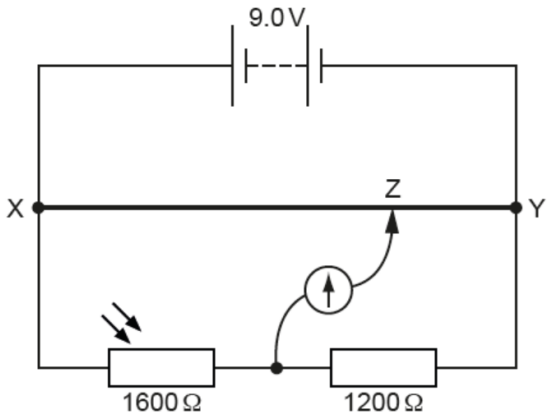

Fig. 6.2

The length of the wire XY is 1.2 m. The movable connection Z is positioned on the wire XY so that the galvanometer gives a zero reading.

(i) Calculate the length XZ along the resistance wire when the LDR has a resistance of 1600 Ω.

length XZ = ……..…… m [2]

(ii) The intensity of the light illuminating the LDR is now increased.

State and explain whether there is a decrease, increase or no change to:

1. the length XZ so that the galvanometer reads zero.

……
…..…

……..
.……

…… [2
……..]

……
……..

2. the total power supplied by the battery.

……..……
……

……..……
……

……..…… [2
……]

……..……
……

[Total: 8]