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- (ii) Explain why gamma radiation obeys an inverse square law but alpha and beta radiation do not.

(9)

(Total 15 marks)

Q2.

- (a) (i) Describe the behaviour of a wire that obeys Hooke's law.

- (ii) Explain what is meant by the elastic limit of the wire.

- (iii) Define the Young modulus of a material and state the unit in which it is measured.

(5)

- (b) A student is required to carry out an experiment and draw a suitable graph in order to obtain a value for the Young modulus of a material in the form of a wire.

A long, uniform wire is suspended vertically and a weight, sufficient to make the wire taut, is fixed to the free end. The student increases the load gradually by adding known weights. As each weight is added, the extension of the wire is measured accurately.

- (i) What other quantities must be measured before the value of the Young modulus can be obtained?

- (ii) Explain how the student may obtain a value of the Young modulus.

(iii) How would a value for the elastic energy stored in the wire be found from the results?

(6)

(Total 11 marks)