Practice Question Set For A-Level
Subject : Physics
Paper-1 Topic: Particle And Radiation

Name of the Student:_____
Max. Marks : 19 Marks **Time : 19 Minutes**

Q1.

(a) What phenomenon can be used to demonstrate the wave properties of electrons?

_____

(1)

(b) Calculate the wavelength of electrons travelling at a speed of 2.5×10^5 ms^{-1}.

Give your answer to an appropriate number of significant figures.

wavelength _____ m

(3)

(c) Calculate the speed of muons with the same wavelength as these electrons.

mass of muon = 207 × mass of electron

speed _____ ms^{-1}

(2)

(Total 6 marks)

Q2.

(a) A fluorescent tube is filled with mercury vapour at low pressure. After mercury atoms have been excited they emit photons.

(i) In which part of the electromagnetic spectrum are these photons?

_____

(1)

(ii) What is meant by an excited mercury atom?

_____

_____

_____

_____

(1)

(iii) How do the mercury atoms in the fluorescent tube become excited?

_____

_____

_____

_____

(2)

(iv) Why do the excited mercury atoms emit photons of characteristic frequencies?

_____

_____

_____

_____

_____

_____

(3)

(b) The wavelength of some of the photons emitted by excited mercury atoms is 254 nm.

(i) Calculate the frequency of the photons.

frequency _____ Hz

(2)

(ii) Calculate the energy of the photons in electron volts (eV).

energy _____ eV

(2)

(c) Explain how the coating on the inside of a fluorescent tube emits visible light.

_____

_____

_____

_____

(2)

(Total 13 marks)