A Level · OCR · Physics

3 mins 3 questions

Multiple Choice Questions

X-rays

X-Ray Tube / X-ray Attenuation Mechanisms / Calculating X-ray Attenuation / X-ray Imaging / CAT Scans

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Total Marks /3

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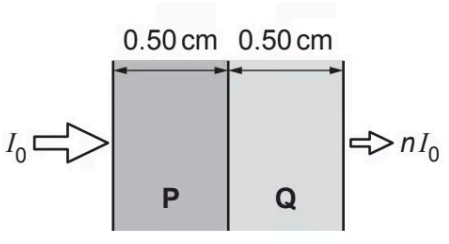
1 The intensity of a beam of X-rays incident on material **P** is I_0.

The beam passes through 0.50 cm of material **P** and 0.50 cm of material **Q**.



The absorption (attenuation) coefficients of **P** and **Q** are 0.60 cm^{-1} and 0.20 cm^{-1} respectively. The intensity of the beam after passing through both **P** and **Q** is nI_0.

What is the value of *n*?

A. 0.67

B. 0.74

C. 0.82

D. 0.90

(1 mark)

2 There are four important attenuation mechanisms by which X-ray photons may interact when they pass through matter.

In which mechanism is the X-ray photon scattered with a longer wavelength?

A. simple scattering

B. Compton effect

C. pair production

D. photoelectric effect

(1 mark)

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3 A contrast material is used while taking an X-ray image of a patient. Which statement is correct?

A. Iodine is a contrast material.

B. Technetium is a contrast material.

C. A contrast material must have a short half-life.

D. A contrast material is used for acoustic matching.

(1 mark)

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