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DATE

Physics Practical - 1

1) Explain any one application based on this experiment (Relevant to your core branch)

Ans i) Lattice theory explains how atoms of various elements or molecules co-exist in a definite arrangement. This definite arrangement is called crystal lattice or crystal structure.

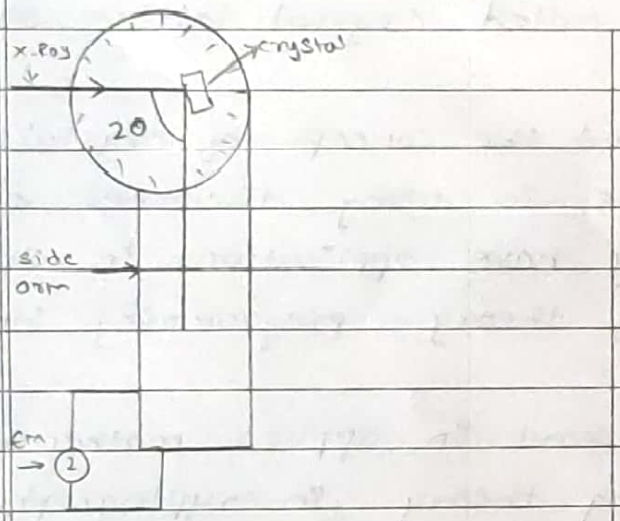
ii) The lattice theory and the concept of crystal lattices plays an important role in many disciplines of Computer Science. They have applications in distributed computing, concurrency theory, programming language and data mining.

iii) Lattice also play a part in applied mathematics in connection with coding theory, in cryptography because of computational hardness of several lattice problems and are used in various type of physical science.

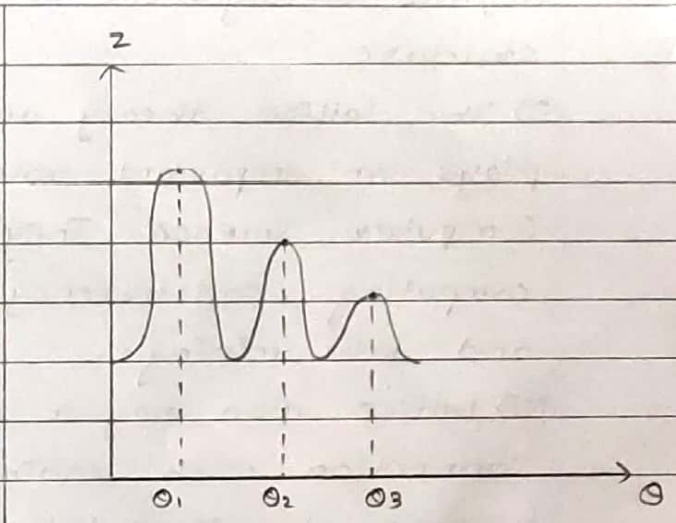
iv) Lattice models are generally studied in physics by the techniques of computational physics to study the crystalline structure of a solid.

2.) Explain any other technique or experiment other than the one performed which will achieve the result and fulfill the aim of the experiment.

Ans: i) Bragg's spectrometer consist of a crystal, a side arm and an EM, etc.



a) Spectrometer



b) Graph obtained

ii) By Bragg's spectrometer, we get the values of 2θ angles i.e. the angle by which side arm is rotated, by this we get the Bragg's reflection angle for their respective order.

∴ By Bragg's law: $2d\sin\theta = n\lambda$

where θ, n and λ are given values.

iii) Also, we can find 'a' i.e. lattice constant by the formula $d = \frac{a}{\sqrt{h^2+k^2+l^2}}$, and thus the value of

$d_{100} : d_{110} : d_{111}$ can be found and the structure of the lattice can be determined.