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PHYSICS Assignments

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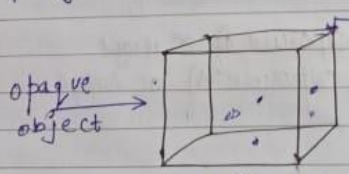
Q.1) Write a short note on ~~X-ray~~ radiography. Compare different radiations used with their applications?

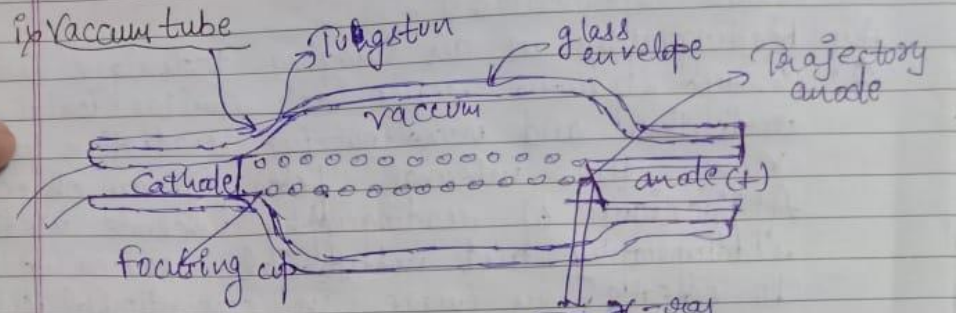
Ans Radiography is an imaging technique using x-rays, gamma rays or similar ionizing radiation to view the internal form of an object. Applications of radiography include medical radiography and industrial radiography. To create an image in conventional radiography, a beam of x-rays is produced by an x-ray generator & is projected toward the object. A certain amount of the x-rays or other radiation is absorbed by the object, dependent on the object's density & structural composition. The x-rays that pass through the object are captured behind the object by a detector.
The generation of flat two dimensional images by this technique is called projectional radiography.



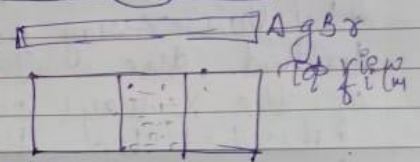
we use radiography—

1. To find casting defect.
2. To medical x-ray.
3. airport security check.
4. Dental.

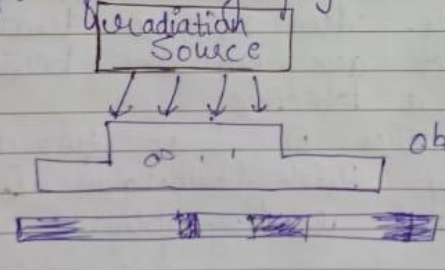
x-ray radiography



flow of e from cathode to anode



principle of radiography



dark area → more exposure of x rays
light area → less exposure of x rays.

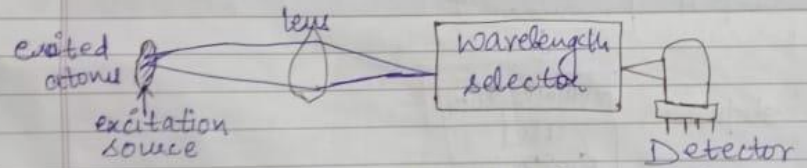
Advantage:

1) No part pre-preparation is required.
2) Both surface & internal dissimilarities can be detected.

Q.2) Explain Atomic emission testing and analyse where it could find applications?

Ans Atomic emission spectroscopy (AES) is a method of chemical analysis that uses the intensity of light emitted from a flame, plasma, arc, or spark at a particular wavelength to determine the quantity of an element in a sample.

The wavelength of the atomic spectral line in the emission spectrum gives the identity of the element while the intensity of the emitted light is proportional to the number of atoms of the element. The sample may be excited by various methods.



- Common applications of atomic emission spectroscopy are in the analysis of trace elements in soils, water, metals, biological specimens, clinical specimens, food & physical evidence such as glass, & other solids.
- In determining the impurities of Ni, Cu, Mn, Al etc in iron & steel in metallurgical processes.
- Lubricating oils can be analysed for Ni, Fe, Mn etc.
- Solid samples & animal tissues have been

Application :-

- Used at complex place where access is difficult in pipe line checking
- steam turbine parts.

X-ray radiography	γ-ray radiography
1) X-ray is produce by electons.	1) Gamma ray are produce during nuclear decay by nuclie of atom.
2) X-ray have less penetrating power.	2) γ-ray have more penetrating power.
3) Cant inspect no of casting at one time.	3) Can inspect no of casting at same time.
4) Equipment are non parabolic.	4) Equipment are parabolic
5) Rapid method.	5) Time consuming.

3) Significant variation in composition can be detected.

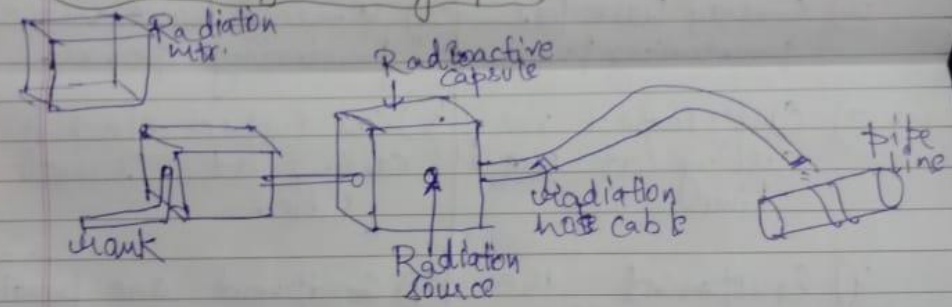
4) Permanent test record is obtained

Disadvantage:-

1) Hazardous to operation and other nearby person.

2) High degree of skill and experience is required.

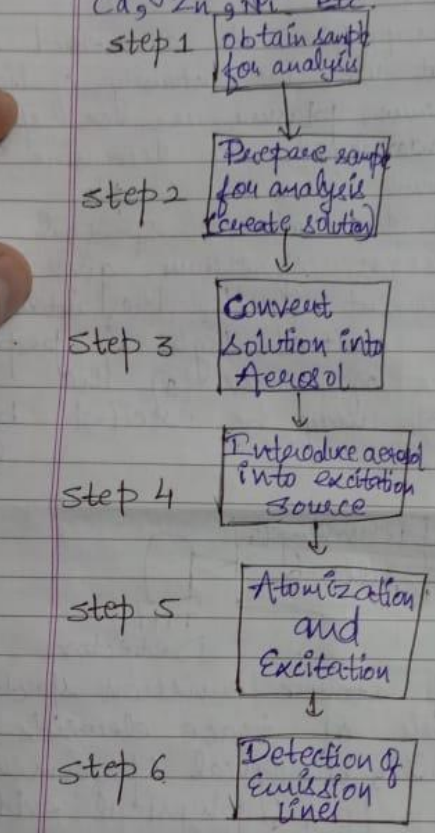
* Gamma ray radiography:-



* Gamma rays had no mass, no charge.

Co60 and Ir-192 used as radiation source enclosed in capsule known as radioactive capsule.
This capsule is attached with hose cable.

analysed for several elements including Ka, Ba, Ca, Zn, Ni etc.



- Qualitative analysis is done using Atomic emission spectroscopy.
- Quantitative analysis with a plasma can be done using either an atomic or an ionic line.