Microscopy

Microscope → Optical Instrument

→ Used to Enlarge object or Microorg.

Which cannot be seen by our Naked eyes.

Types

[DEPTH OF BIOLOGY]

Light Microscope

- Use Light to See object.

1. Bright field microscopy.
2. Light field Microscopy.
3. Phase Contrast Microscopy.
4. Dark field

[DEPTH OF BIOLOGY]

Electron Microscope

- Use Beam of e⁻ to see object.

Electron Microscopy.

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* Bright field Microscopy ⇒

Name derived from the fact that the Specimen is dark & Contrasted by the Surrounding bright Viewing field.

B.F.M → Is the Most elementary form of Microscopy technique. (commonly)

Advantage ⇒ Simple to Use.

→ Some specimen can be viewed without staining.

Disado ⇒ Low Contrast Image form.

Dark field Microscopy ⇒

→ Used to see Unstained Samples.

→ Unstained Sample appear brighter against dark background.

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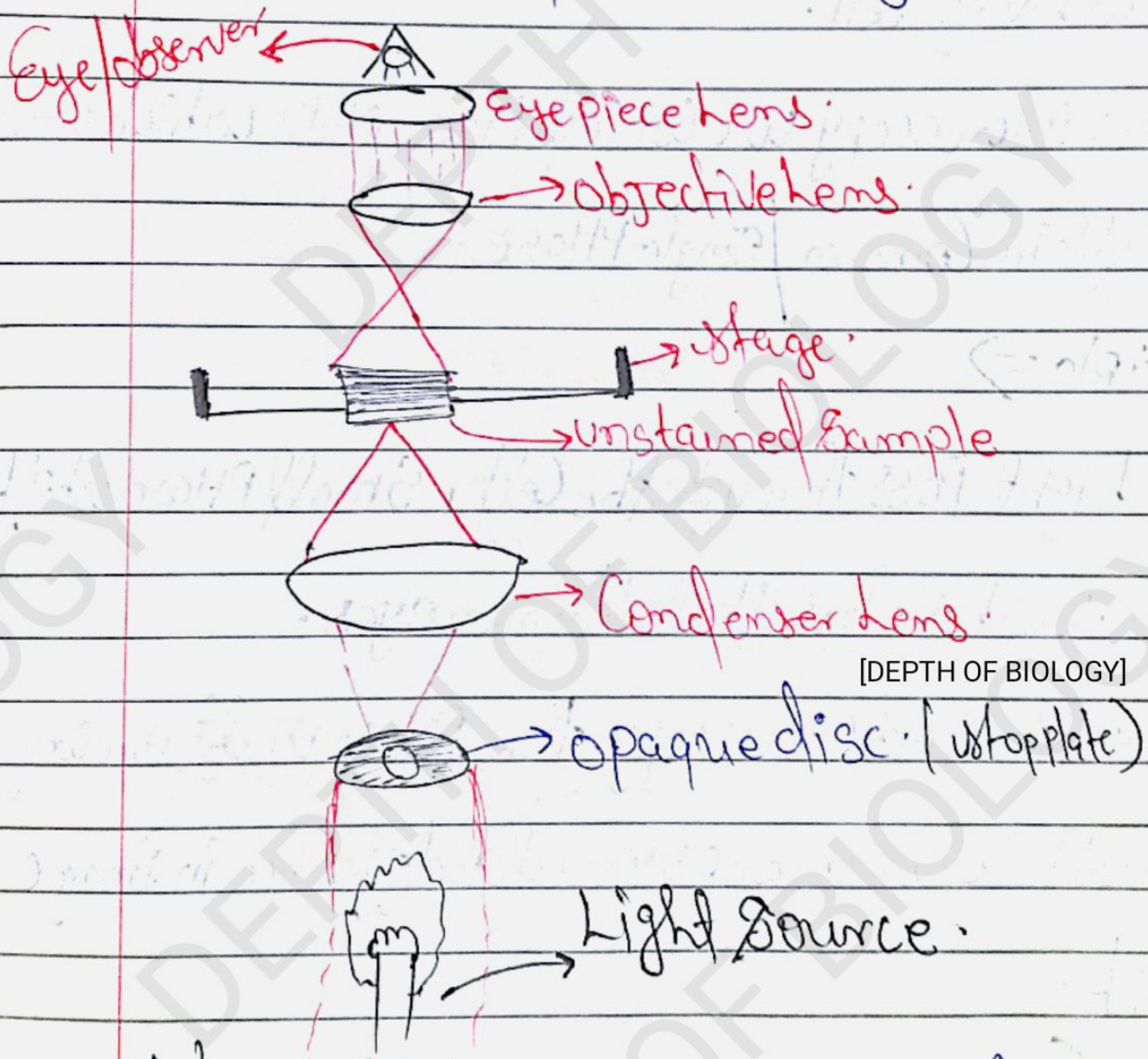
Principle ⇒

Light easily scattered.

To See specimen in this Microscopy. Opaque disc is placed under Condenser lens due to which the Light scattered by object on Slide reaches to eyes.



Use ⇒ Bright contrast, Live detection.
Simple & effective.

Zernike

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→ Not Ideal for thick organisms or particles.

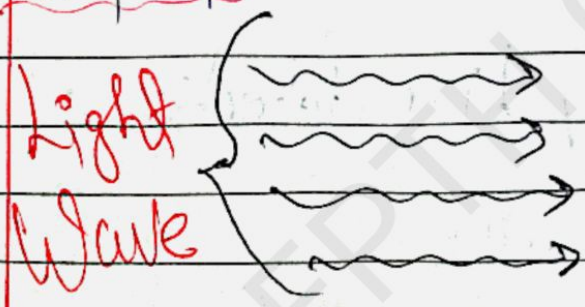
PHase Contrast Microscopy ⇒

It is Contrast enhancing optical technique that utilize to produce high Contrast images of transparent specimen such as living Cell. [DEPTH OF BIOLOGY]

In this Microscopy use Conical PHase plate which emerges the light in Common/Single PHase. [DEPTH OF BIOLOGY]

Principle ⇒

- When light Pass through the Cell, Small PHase shift occur, which are Invisible to human eyes.
- In PHase Contrast Microscopy the PHase shift are converted into amplitude which can observed as difference in Image Contrast. [DEPTH OF BIOLOGY]



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Application ⇒

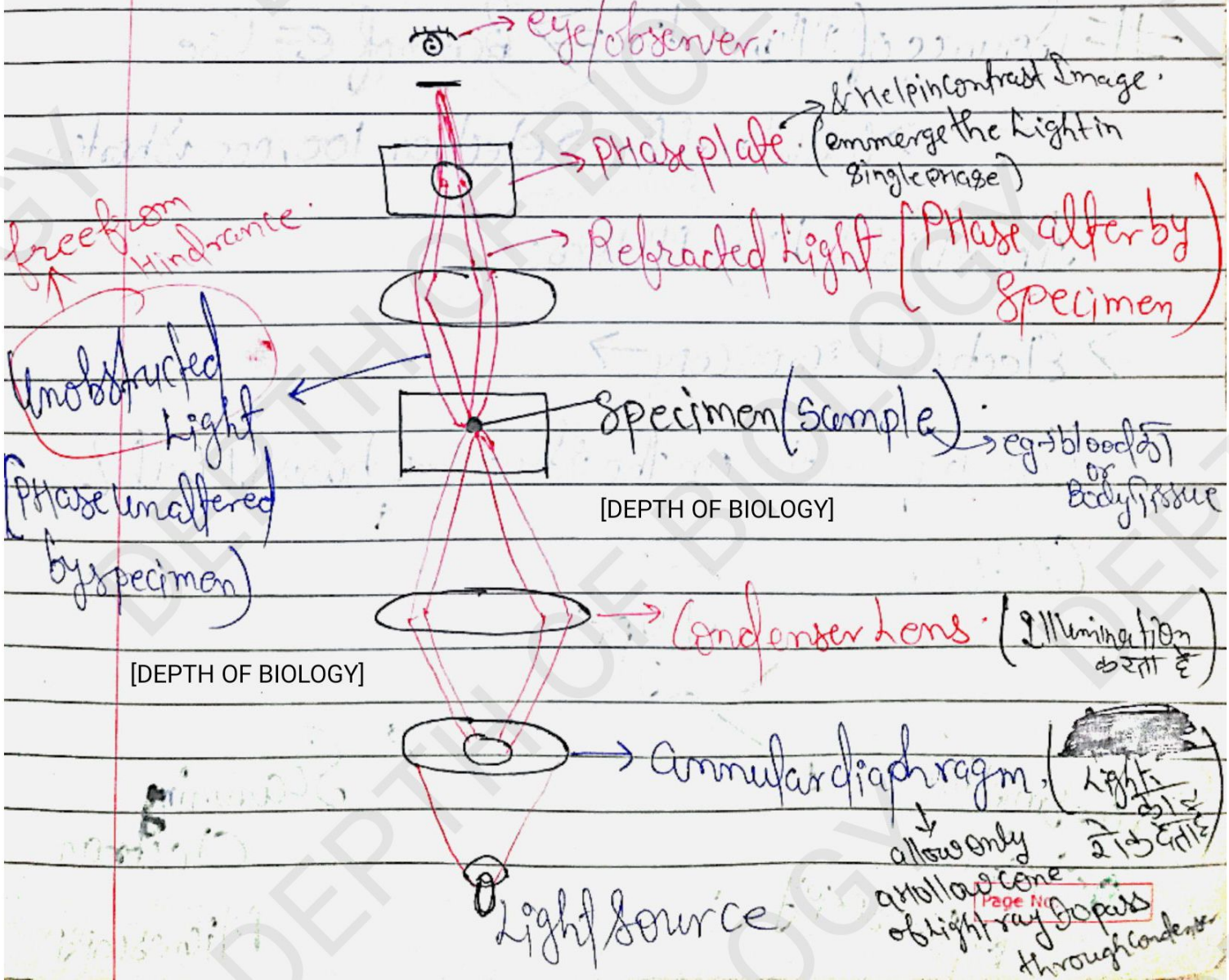
– To produce high contrast image of transparent specimen such as → Living cell, Microorganism, fibers, study of cell division.

Advantages ⇒

(a) Living cell → Observed in Natural state.

(b) It Make slightly transparent object More Visible.

(c) Examine Intracell. Components.



Electron Microscopy ⇒

⇒ Electron Microscopy is a techq. used to obtain high resolution images of Biological & Non-Biological specimen.

- Used in Biomedical research also to find detail struc. of tissue, cell organelles & Macromolecules Complex.
- Electron Microscopy Use Magnetic field to form electron optical lens system. [DEPTH OF BIOLOGY]

Source of Illumination ⇒ Beam of e⁻ Use.

→ Wavelenght → electron 100,000 shorten then Visible Light Photons.

⇒ Electron Microscopy →

Key Information on the structure basis of Cell & Cell disease. [DEPTH OF BIOLOGY]

Types

Transmission electron Microscopy.

Scanning Electron Microscopy.

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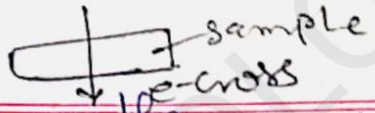


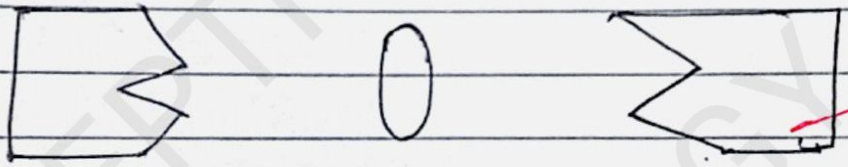
① TEM ⇒ To View Thin Specimen.

② SEM ⇒ Provide detail Images of surface of cell.

Provide 3D struc' on surface of specimen.
e⁻ are scattered & emit from specimen surface & structure of surface only.

→ Electron source.

[DEPTH OF BIOLOGY]



→ Condenser lens.
Light is passes through sample.

→ objective lens.

→ Image.

[DEPTH OF BIOLOGY]

→ Projector & Magnetic lens.

→ final Image.