

1. C.R.O.

(i) Electron gun

- Cathode
- Grid
- Focusing anode
- Accelerating anode

(ii) Deflecting system

- Vertical deflection plates YY' (Input)
- Horizontal deflection plates XX' (time-base)

Input x time base x

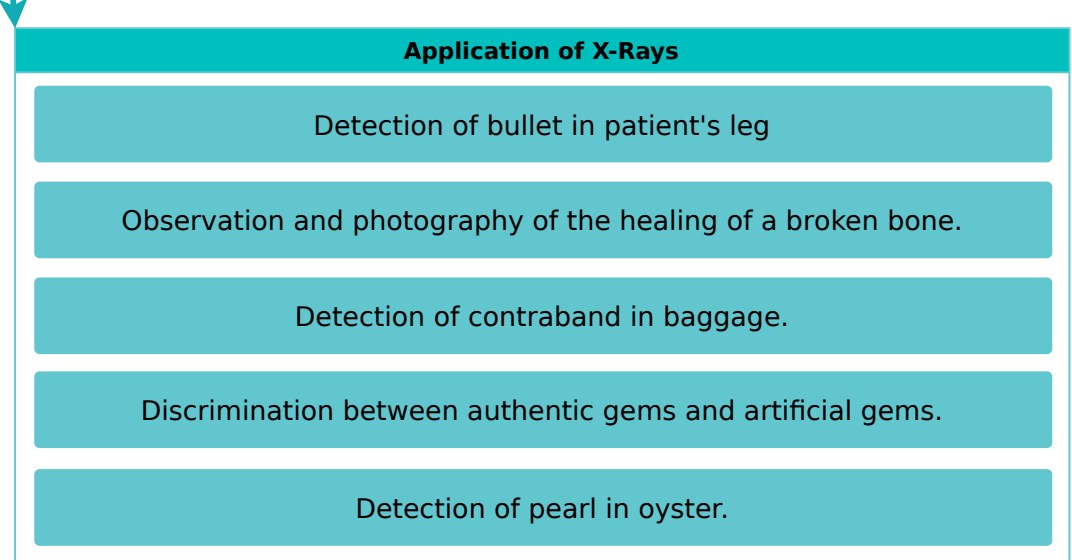
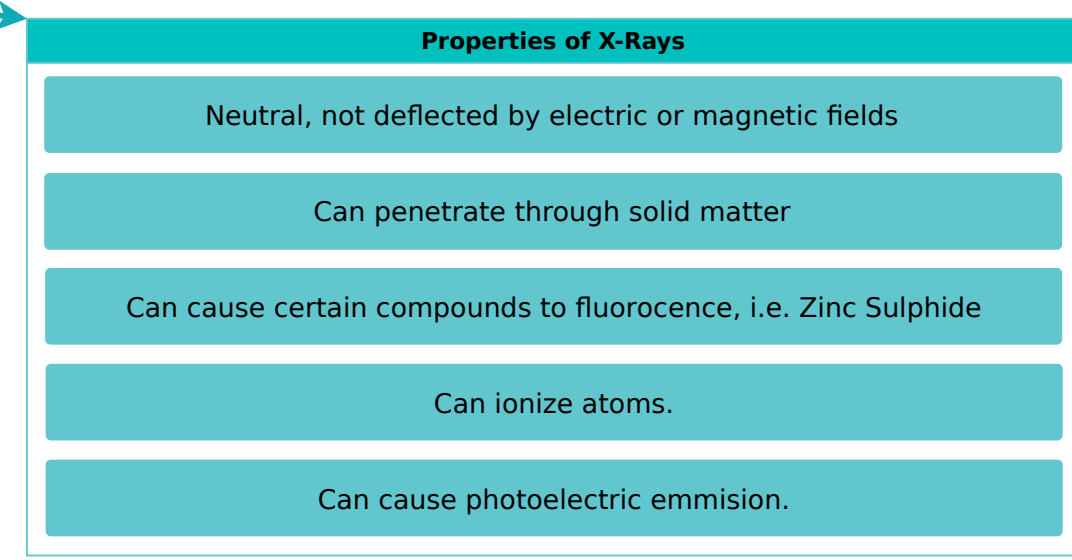
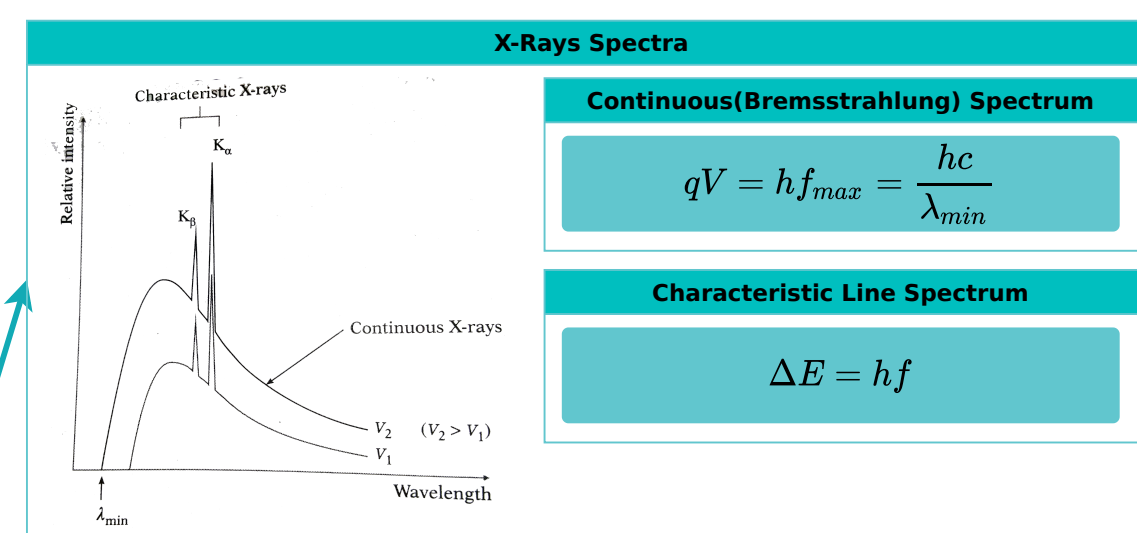
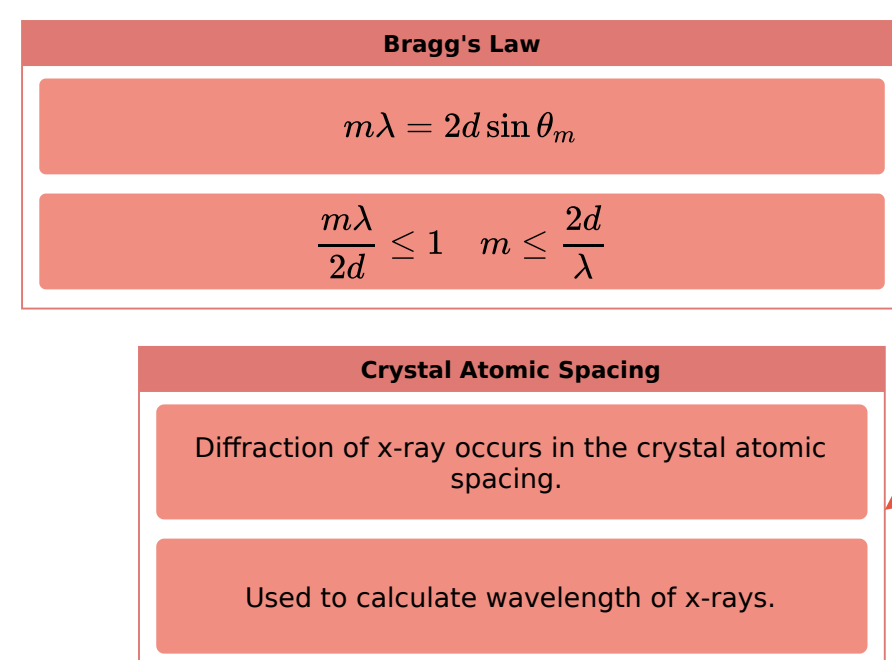
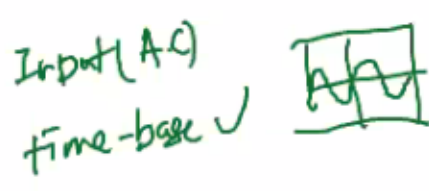
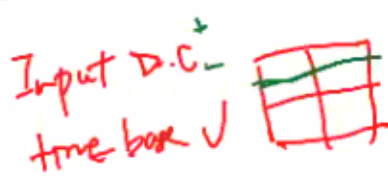
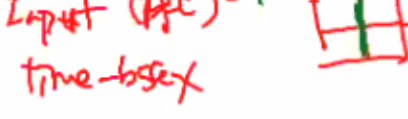
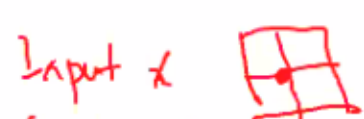
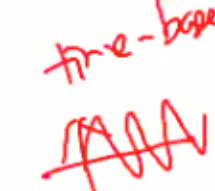
Input (D.C.) time base x

Input (A.C.) time base x

Input x time base x

Input (D.C.) time base x

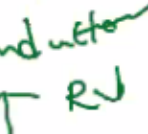
Input (A.C.) time base x



**(iii) P-type:** B, Al  
majority: holes  
minority: free electron

**2. Semiconductor**

(b) Examples: Si - Ge

(c) Intrinsic Semiconductor : (i) 0 K [Insulator]  
 covalent bond pair conductor  
(ii) T ↑, R ↓  
charge carriers: free electron pairs hole:  
electron-hole pairs

d) Extrinsic semiconductor

(i) Doping

(ii) N-type (Penta-valent element)  
P (Donor)  
majority charge carrier: free electron  
minority: holes

Thermistor Light ↑, R ↓ Intensity LDR

**Semiconductor**

**Free Electron**

**Voltage band**

**P < 10^-10 m**

**N > 10^16 cm^-3**

**Intrinsic Semiconductor**

**Charge Carriers**

**Hole**

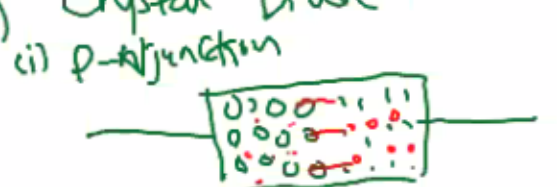
**T ↑, R ↓**

**Semiconductor**

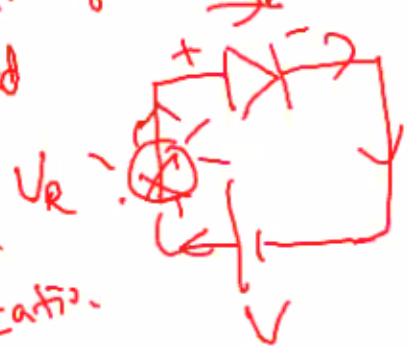
**T ↑, R ↓**

2.

(e) Crystal Diode:



(ii) Forward-biased



- (iv) Rectification
  - Half-wave rectification
  - Full-wave rectification

(P) A C(N)

diffusion current : Dynamic equilibrium  
drift current : (iii) Reverse biased

(iii) Reversed biased



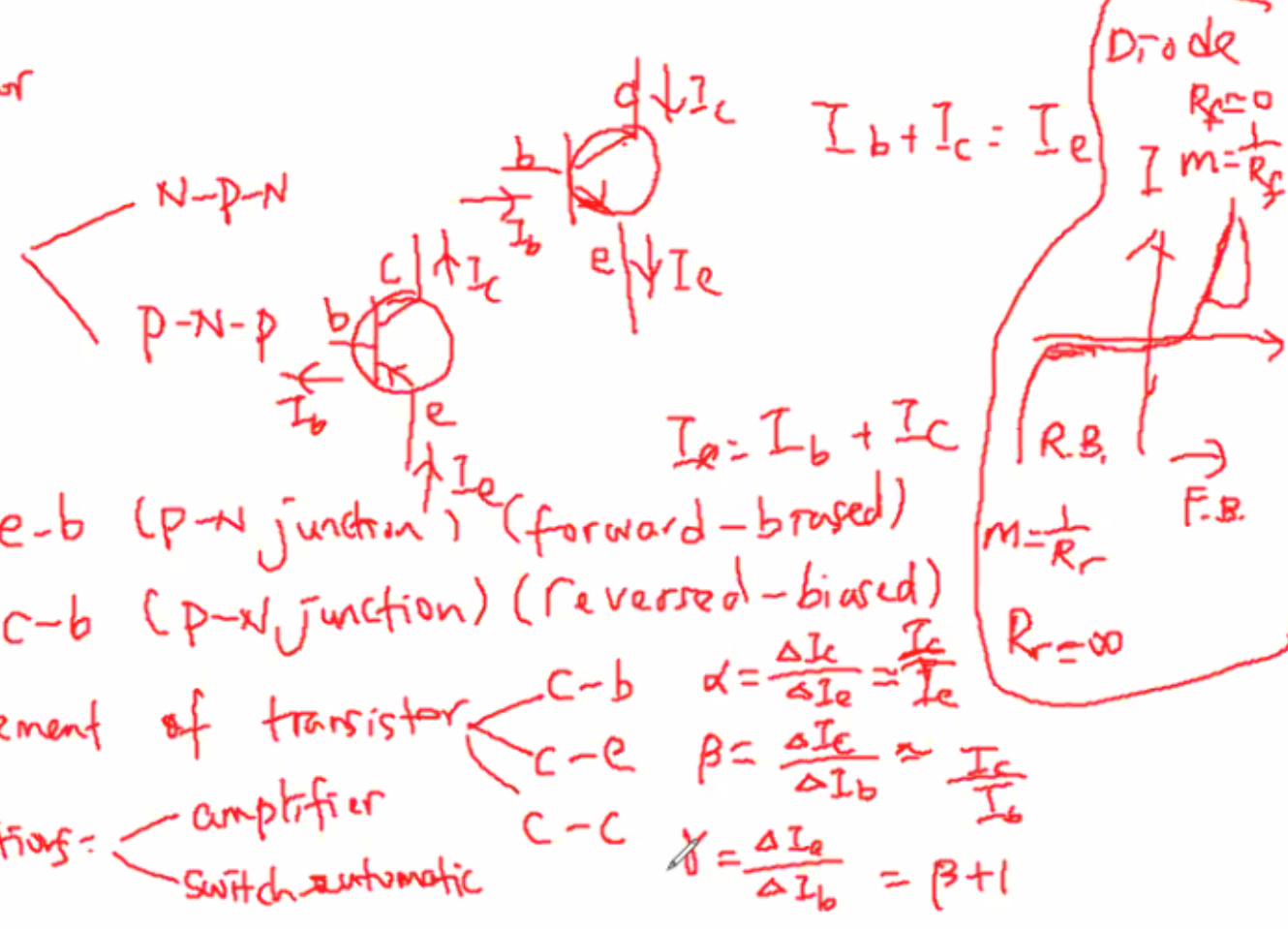
unidirectional<sup>v</sup> electrical conduction

$$V = V_R + V_D$$

## 2 Semiconductor

(f) Transistor

(i) Types



(ii)  $\star$  e-b (p-n junction) (forward-biased)  
 c-b (p-n junction) (reverse-biased)

Lim Arrangement of transistor

civ Applications:-  $\left\{ \begin{array}{l} \text{amplifier} \\ \text{switch automatic} \end{array} \right.$