

Silicon Controlled Rectifier (SCR)

Lecture – 5

**TDC PART – I
Paper - II (Group - B)
Chapter - 5**

by:

Dr. Niraj Kumar,

Assistant Professor (Guest Faculty)

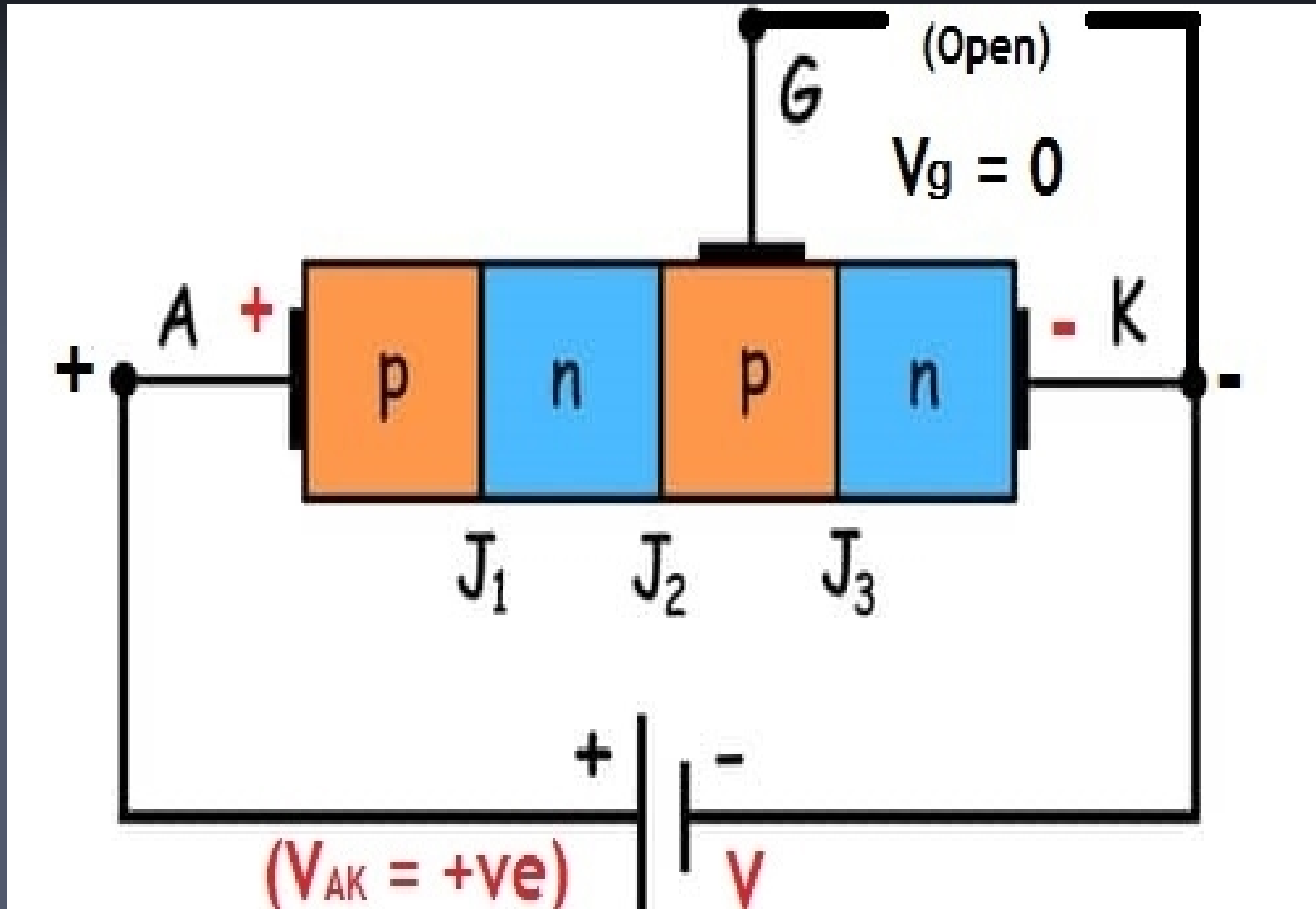
Department of Electronics

**L.S. College, BRA Bihar University,
Muzaffarpur.**

SCR Biasing Condition

➤ Forward Bias Condition

- For proper working of a SCR it is necessary to proper bias the SCR. for proper biasing the SCR, it is essential to apply voltages of correct polarity across Anode (A) and Cathode (K) terminal of the SCR. In term of Biasing of a SCR, **with** the polarity of V as shown in **Fig (22)**, when the Anode (A) terminal of SCR is connected with a Positive (+) terminal of battery and Cathode (K) terminal of SCR is connected with a Negative (-) terminal of the battery, the **condition is known as a Forward Bias Condition**. In Forward Bias Condition the junctions J1 and J3 become Forward Biased whereas J2 is Reverse Biased. Hence, no current (except leakage current flow through junction J2) can flow through the SCR. SCR Forward Bias Condition is shown in **Fig (22)** below.

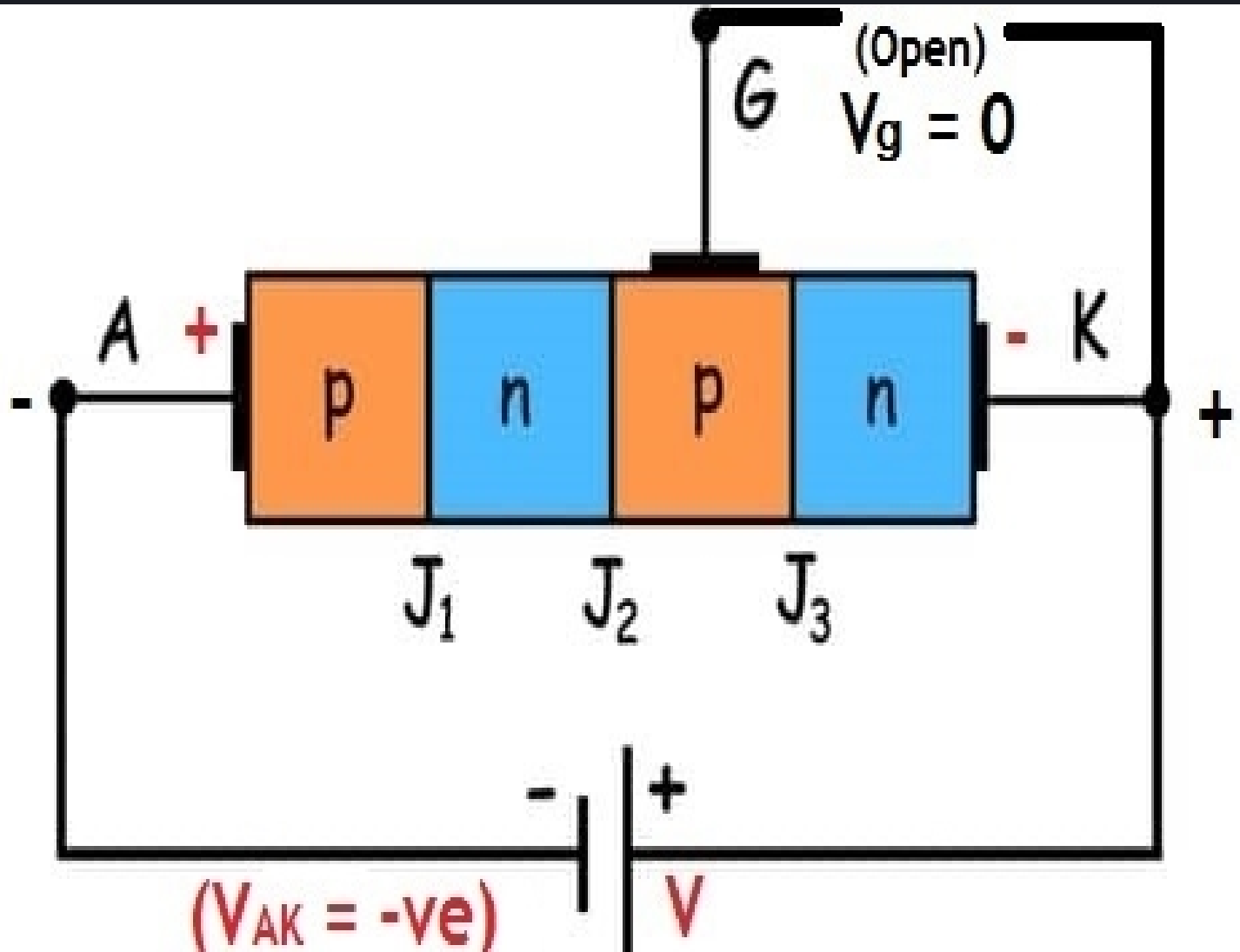


■ Fig (22) Shown SCR Forward Bias Condition.

- As from previous discussion, we know that the basic operation of the SCR is different from the fundamental two layer semiconductor diode in that a third terminal, called Gate (G) determines when the rectifier switches from the Open-circuit state (OFF-State) to Short-circuit state (ON-State) state. It is not enough to simply forward-bias the Anode-to-Cathode region of the device. From **Fig (22)**, if Forward Bias Condition is to be established, the Anode (A) must be Positive (+) with respect to the Cathode (K) that means Cathode (K) is connected with Negative (-). This is not, however a sufficient criterion for turning the device ON. A Positive Pulse of sufficient magnitude must also be applied to the SCR Gate (G) terminal to establish a turn-ON Gate current (I_g).

➤ Reverse Bias Condition

- In **Fig (23)**, polarity of V has been reversed. When the Anode (A) terminal of SCR is connected with a Negative (-) terminal of battery and Cathode (K) terminal of SCR is connected with a Positive (+) terminal of the battery, the SCR is connected in Reverse Bias. **This condition is known as a Reverse Bias Condition.** It is seen that, in Reversed Bias Condition, now junctions J1 and J3 become reverse-biased and only J2 is forward-biased. Again, there is no flow of current through the SCR. SCR Reversed Bias Condition shown in **Fig (23)** below.



■ **Fig (23)** Shown SCR Reversed Bias Condition

■ to be continued