# Science & Technology · GS - III

**Semiconductor technology has emerged as a strategic instrument in the evolving geopolitical competition between the United States and China. Discuss how technology export controls are reshaping global power relations. Examine the implications for global trade, technological innovation and India's strategic interests.**

| EXAM YEAR | PAPER | SUBJECT |
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| 10 | ~150 words |

## Answer Hint

**Semiconductor export controls reflect technological nationalism, weaponisation of supply chains and strategic competition. They threaten global trade, fragment innovation ecosystems and create opportunities for India's semiconductor ambitions.**

## Model Answer

Semiconductors are the backbone of modern economies, powering artificial intelligence, defence systems, telecommunications and advanced manufacturing. The recent US restrictions on China's remote access to advanced AI chips through overseas data centres highlight the growing weaponisation of technology.

**Implications:**

1. **Geopolitical rivalry:** The US seeks to preserve its technological advantage, while China views restrictions as an attempt to contain its technological development.
2. **Global trade fragmentation:** Export controls disrupt semiconductor supply chains and increase uncertainty for multinational companies.

3. **Technological nationalism:** Countries are prioritising domestic chip manufacturing to reduce strategic dependencies.
4. **Innovation challenges:** Restricted access to advanced computing resources can widen technological inequalities and fragment global research ecosystems.

**Opportunities for India:**

- Strengthen domestic semiconductor manufacturing under the India Semiconductor Mission.
- Promote research in chip design, fabrication and advanced packaging.
- Build strategic partnerships with the US, Japan, Taiwan and South Korea.
- Develop resilient semiconductor supply chains.

**Conclusion:** India must balance strategic autonomy with global technological cooperation to emerge as a trusted semiconductor and AI ecosystem.

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