Mains Practice Question

Q. Discuss the various challenges faced by the semiconductor industry in India. How India Semiconductor Mission (ISM) can mitigate these challenges? (250 words)

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Approach

- Write a brief introduction about the semiconductor industry in India.
- Mention challenges faced by the semiconductor industry in India.
- Mention the role of Indian Semiconductor Misission in mitigating the challenges.
- Write a conclusion.

Introduction

Semiconductor chips are the fundamental building blocks and the "heart and brain" of modern electronics and information and communication technology (ICT) products. According to Invest India, the Indian semiconductor market was valued at approximately $23.2 Bn and is projected to reach $80.3 Bn by 2028.

Body

However, the industry faces challenges such as:

- **High Setup Costs**
  - Setting up a semiconductor fabrication plant (fab) requires an investment of anywhere between $3 and $7 billion, because of which private players may feel reluctant to step in.
  - The government has announced an incentive scheme of Rs 76,000 crore for the development of semiconductor and display manufacturing in India, but the industry experts feel that the amount is insufficient and the approval process is slow.
- **Competition from Global Leaders:**
  - India has to compete with the established and dominant players in the global semiconductor market, such as China, Taiwan, USA, and Japan, who have economies of scale, advanced technology, and strong supply chains.
  - India also faces the risk of losing its existing market share in the semiconductor design and services segment, as other countries are investing heavily in this domain.
- **Lack of a Robust Supply Chain**
  - India lacks a robust and integrated supply chain for the semiconductor industry, which involves the availability of raw materials, equipment, components, testing facilities, and skilled manpower.
- **Need for Innovation and R&D**
  - India needs to foster a culture of innovation and research and development (R&D) in the semiconductor industry, to keep pace with the ever-changing consumer demands, market trends, and technological advancements.
- **Lack of skilled labor and technology:**
  - While India boasts a large pool of engineering and technical talent, there’s a need for specialized skills in semiconductor manufacturing.
  - Indian Semiconductor Mission should collaborate with educational institutions and industry

experts to design targeted skill development programs.

To mitigate these challenges and meet its domestic demand which is expected to cross USD 80 billion by 2026 and to USD 110 billion by 2030, India has launched India Semiconductor Mission (ISM). Some of the ways that ISM can mitigate the challenges faced by the semiconductor industry in India are:

- **Providing Fiscal Support:**
  - ISM offers various schemes to provide fiscal support to eligible applicants for setting up of semiconductor and display fabs, compound semiconductors, sensors, and ATMP/OSAT facilities in India.
  - The fiscal support can range from 30% to 50% of the project cost, depending on the type and scale of the facility.
  - The fiscal support can help in reducing the high setup costs and attracting large investments for the semiconductor industry in India.
- **Enhancing Competition and Innovation:**
  - ISM organizes events and conferences, such as Semicon India, to showcase the potential and opportunities of the semiconductor industry in India and to facilitate networking and collaboration among various stakeholders.
  - ISM also promotes innovation and R&D in the semiconductor domain, by encouraging the development of indigenous technologies, intellectual property, and patents.
  - ISM can help in enhancing the competition and innovation in the semiconductor industry in India, and enable India to compete with the global leaders in this sector.
- **Developing a Robust Supply Chain:**
  - ISM aims to create a holistic and integrated supply chain for the semiconductor industry in India, by ensuring the availability of raw materials, equipment, components, testing facilities, and skilled manpower.
  - ISM also aims to reduce the dependence on imports for the semiconductor needs, and to increase the domestic production and consumption of semiconductors in India.
  - ISM can help in developing a robust supply chain for the semiconductor industry in India, and to enhance the self-reliance and resilience of the economy.

Conclusion

Becoming a prominent player in the global semiconductor industry poses considerable challenges, but it is not an insurmountable journey. Initiatives like the India Semiconductor Mission (ISM) offer crucial support through fiscal aid, fostering innovation, and building a strong supply chain. ISM can play a pivotal role in making India a competitive force in the global semiconductor market, driving economic progress and technological advancements.