P. L. RAJ UPSC MAINS Q&A - DAY 26

Mission Sudarshan Chakra

India's defence capability took a major leap forward when the Defence Research and Development Organisation (DRDO) successfully conducted the maiden flight tests of the Integrated Air Defence Weapon System (IADWS) off the Odisha coast. This achievement marks a critical milestone under the larger framework of Mission Sudarshan Chakra, which aims to establish a multi-layered, homegrown security shield by 2035 to protect the nation from multi-domain threats. The test has attracted significant attention not only because of its advanced technological parameters but also for its symbolism in India's growing pursuit of strategic self-reliance and indigenous defence innovation.

Explaining the Sudarshan Chakra Test

The Integrated Air Defence Weapon System (IADWS) tested recently is a multi-layered defence system, designed and developed indigenously by DRDO. The system combines -

1. **Quick Reaction Surface-to-Air Missiles (QRSAM)** – capable of engaging high-speed aerial targets at medium ranges.
2. **Very Short-Range Air Defence Missiles (VSHORADS)** – designed to neutralise low-flying aerial threats such as drones, helicopters, and attack aircraft.
3. **Directed Energy Weapons (DEW)** – high-power laser systems to disable and destroy enemy drones and aerial vehicles. All components of the system are networked through a Centralised Command and Control Centre, ensuring seamless coordination, real-time monitoring, and precision engagement.

During the test, three different aerial targets – including high-speed unmanned aerial vehicles and multi-copter drones – were simultaneously intercepted and destroyed by different layers of the IADWS. Importantly, the flawless functioning of radars, communication systems, and the integrated command structure was validated during these trials.

Key Parameters of the Test

1. **Simultaneous Engagement** – Multiple targets of different speeds and altitudes neutralised at once.
2. **Use of Multiple Weapons** – QRSAM, VSHORADS, and DEW functioned together under centralised command.
3. **Indigenous Technology** – All major components were developed within India, showcasing Atmanirbhar Bharat in defence.
4. **Multi-Layered Shielding** – Capacity to defend against long-range missiles, UAVs, and enemy aircraft simultaneously.

Difference from Previous Systems

India already operates powerful air defence assets like -

1. S-400 Triumf (Russian origin)
2. Barak 8 MRSAM (joint Indo-Israel system)
3. Akash Missile System (indigenous)

However, the Sudarshan Chakra initiative differs in several ways -

1. **Fully Indigenous Development** - Unlike the S-400 and Barak, IADWS is entirely homegrown.
2. **Directed Energy Weapons** - First operational integration of laser-based systems into India's defence shield.
3. **Multi-Domain Coverage** - Goes beyond missiles by integrating surveillance, cyber defence, and counter-drone technologies.
4. **Future-Oriented** - Designed to be the backbone of a **comprehensive security grid by 2035**.

Significance of the Test

1. **Strategic Autonomy** – Reduces dependency on foreign suppliers for critical defence technology.

2. **Comprehensive Protection** – Multi-layered defence ensures safeguarding of critical infrastructure, borders, and cities.

3. **Counter to Modern Threats** – With drones, swarm attacks, and hypersonic missiles becoming more common, IADWS addresses future warfare challenges.

4. **Boost to Defence Industry** – Encourages participation of private sector and start-ups alongside DRDO, spurring domestic innovation.

5. **Geopolitical Significance** – Signals to adversaries that India is rapidly advancing its indigenous defence preparedness.

Role in Operation Sindoor

The relevance of a strong integrated defence grid was seen during Operation Sindoor, when Indian armed forces successfully intercepted Pakistani drones and missiles. Systems like S-400, Barak 8, and Akash were crucial in neutralising these threats. The newly tested IADWS, when integrated with IAF's Integrated Air Command and Control System (IACCS) and the Army's Akashteer, will provide a more synchronised, layered, and future-ready shield, strengthening the lessons learnt from Operation Sindoor.

DRDO's Vision

DRDO's long-term vision is to establish India as a global leader in indigenous defence technology. With systems like IADWS, it is moving beyond conventional missiles towards -

1. Laser-directed energy systems,
2. Integrated command platforms, and
3. Cyber-physical defence networks.

The roadmap under Mission Sudarshan Chakra also ties into the larger vision of India@2047, where India aspires to become a leading global defence power, not just a buyer of arms.

Relevance to India's Defence Pride

India's defence ecosystem has traditionally been dependent on imports. Achievements like IADWS symbolise a paradigm shift towards Atmanirbharta (self-reliance). It boosts national pride by -

1. Demonstrating scientific innovation capacity.
2. Strengthening strategic deterrence against adversaries.
3. Enhancing employment and skill development in defence industries.

This test also resonates with the historical symbolism of the Sudarshan Chakra – Lord Vishnu's weapon of protection and righteousness – now embodied as India's technological shield of security and sovereignty.

Conclusion

The successful maiden test of the Integrated Air Defence Weapon System under Mission Sudarshan Chakra is not just a scientific milestone but a strategic leap for India's security architecture. It marks the beginning of a new era of multi-layered, indigenous defence shield capable of tackling modern threats ranging from drones to long-range missiles. In the coming years, the challenge will lie in fast-tracking production, ensuring seamless integration with existing systems, and continuous upgradation to stay ahead of evolving threats.

Main Practice Question - GS Paper III (Science & Tech / Internal Security).

1. "Critically examine the significance of DRDO's Integrated Air Defence Weapon System (IADWS) under Mission Sudarshan Chakra in strengthening India's multidomain security architecture. How does it redefine India's defence self-reliance and strategic posture?"

Answering Guidelines

1. Introduction (40–50 words) - Define IADWS and mention its recent maiden test by DRDO. Situate it within Mission Sudarshan Chakra (2035) as part of India's push for multi-layered, indigenous defence shield.

2. Body

(a) Key Parameters of IADWS

1. Indigenous QRSAM, VSHORADS, and Directed Energy Weapons.
2. Centralised Command & Control integration.
3. Multi-layered interception capability (missiles, drones, UAVs).

(b) How it Differs from Previous Systems

1. Beyond imported systems like S-400; emphasizes indigenous, integrated development.
2. Incorporates laser-based DEWs (next-gen tech).
3. Multi-domain integration with IAF's IACCS and Army's Akashteer.

(c) Significance

1. Enhances air defence against UAVs, long-range missiles, cyber threats.
2. Reduces dependence on foreign systems → aligns with Atmanirbhar Bharat.
3. Boosts confidence after successes in Operation Sindoor.

(d) Challenges and Concerns

1. Need for sustained funding and private sector participation.
2. Cybersecurity vulnerabilities in networked defence systems.
3. Integration across services requires institutional synergy.

(e) Broader Implications for India's Defence Posture

1. Strengthens deterrence against adversaries.
2. Expands role as a responsible regional power.
3. Showcases India's defence R&D capabilities globally.

3. Conclusion (40–50 words) - Summarize that IADWS under Mission Sudarshan Chakra is a strategic leap in India's defence evolution. Emphasize it as both a shield and symbol of India's rising technological self-reliance. Future success depends on innovation, integration, and sustained policy support.