Science & Technology · GS - III

Discuss the role of modern train technologies and railway infrastructure upgrades in improving passenger safety, connectivity and operational efficiency in India.

EXAM YEAR	PAPER	SUBJECT
DAILY PRACTICE 31/10/2026	GS - III	Science & Technology

MARKS	WORD LIMIT
10	~150 words

Answer Hint

Vande Bharat trains; railway modernisation; indigenous technology; passenger safety; Kavach system; semi-high-speed connectivity; passenger amenities; infrastructure investment

Model Answer

Introduction

Indian Railways is undergoing modernisation through advanced trainsets, improved signalling and upgraded infrastructure. Initiatives such as Vande Bharat reflect the growing emphasis on technology-driven passenger services.

Major Contributions

- **Passenger Comfort:** Modern trainsets offer improved seating, ergonomically designed berths and upgraded onboard facilities.
- **Safety:** Systems such as Kavach provide automatic train protection and help reduce collision risks.
- **Connectivity:** Faster and more efficient services improve links between major cities and regional centres.
- **Operational Efficiency:** Modern signalling, better maintenance and improved rolling stock can enhance service reliability.
- **Indigenous Capability:** Domestic manufacturing strengthens technological self-reliance and creates industrial opportunities.

Challenges and Way Forward

High capital costs, maintenance requirements, infrastructure constraints and the need for skilled personnel remain important challenges. Investment in track upgrades, safety systems, indigenous manufacturing and last-mile connectivity should be prioritised.

Conclusion

Railway modernisation can strengthen India's transport infrastructure, improve passenger experience and support inclusive economic growth.

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