Science & Technology · GS - III

“India’s Gaganyaan Mission represents an important step towards technological self-reliance and advanced space exploration.” Discuss its objectives, significance and major challenges.

EXAM YEAR	PAPER	SUBJECT
DAILY PRACTICE 18/10/2026	GS - III	Science & Technology

MARKS	WORD LIMIT
10	~150 words

Answer Hint

Gaganyaan Mission, ISRO, human spaceflight, Low Earth Orbit, uncrewed missions, crew safety, life-support systems, re-entry technology, technological self-reliance, scientific research, financial costs, astronaut safety, international cooperation.

Model Answer

Introduction

India’s Gaganyaan Mission, led by ISRO, aims to demonstrate the country’s indigenous capability to send astronauts into Low Earth Orbit and bring them safely back to Earth. Uncrewed test missions are an important step towards validating critical technologies.

Main Body

Objectives and Significance

1. Human spaceflight: Demonstrates India’s capability to undertake crewed space missions.
2. Technological self-reliance: Promotes the development of human-rated launch vehicles, life-support systems, crew escape mechanisms and re-entry technologies.

3. Scientific progress: Creates opportunities for research in microgravity and advanced space technologies.
4. Economic benefits: Encourages innovation, skilled employment and collaboration between ISRO, industries and academic institutions.

Major Challenges

- Ensuring astronaut safety under extreme conditions.
- Developing reliable life-support, thermal protection and recovery systems.
- Managing high costs and complex testing requirements.
- Achieving dependable coordination among different technical agencies.
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Conclusion

Gaganyaan can strengthen India’s position in global space exploration. A phased approach, rigorous testing, indigenous innovation and international cooperation will be essential for the mission’s success.

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