Science & Technology · GS - III

What is the main task of India’s third moon mission which could not be achieved in its earlier mission? List the countries that have achieved this task. Introduce the subsystems in the spacecraft launched and explain the role of the ‘Virtual Launch Control Centre’ at the Vikram Sarabhai Space Centre which contributed to the successful launch from Sriharikota.

EXAM YEAR	PAPER	SUBJECT
2023	GS - III	Science & Technology

MARKS	WORD LIMIT
15	~250 words

Answer Hint

Chandrayaan-3 sought to demonstrate safe and soft landing on the lunar surface after Chandrayaan-2's lander could not complete the landing; the mission combined propulsion, lander and rover systems with distributed launch-support infrastructure.

Model Answer

Introduction

Chandrayaan-3, launched in July 2023, was India's follow-up lunar mission after Chandrayaan-2. Its primary objective was to demonstrate India's capability to achieve a **safe and soft landing on the lunar surface** and conduct surface operations.

Body

Main Task

The earlier Chandrayaan-2 mission failed to achieve a successful soft landing when the Vikram lander lost communication during the final descent. Chandrayaan-3 was therefore designed primarily to demonstrate safe landing, rover mobility and in-situ scientific experiments.

Countries that had successfully achieved controlled soft landings on the Moon before Chandrayaan-3 included the **United States, Soviet Union/Russia and China**.

Spacecraft Subsystems

Propulsion Module: Carried the lander from Earth-bound orbit to lunar orbit and subsequently supported mission operations.

Lander Module – Vikram: Designed for controlled descent and soft landing on the lunar surface.

Rover – Pragyan: Deployed from the lander to move across the lunar surface and conduct scientific measurements.

The mission carried scientific instruments on the lander, rover and propulsion module for studying lunar surface and near-surface characteristics.

Virtual Launch Control Centre

The **Virtual Launch Control Centre (VLCC)** at Vikram Sarabhai Space Centre enabled distributed participation in launch operations. It allowed authorised teams located at different centres to monitor mission parameters, coordinate activities and participate in launch-related operations through secure digital connectivity.

This strengthened coordination among geographically dispersed ISRO teams while reducing dependence on physical presence at a single control facility.

Conclusion

Chandrayaan-3 demonstrated India's capability in **lunar soft landing, rover deployment and distributed mission operations**, marking a major advancement in India's space exploration programme.