Science & Technology · GS - III

Examine the potential of satellite-to-mobile communication technology in bridging the digital divide. Discuss its major challenges and implications for the telecommunications sector.

EXAM YEAR	PAPER	SUBJECT
DAILY PRACTICE 02/11/2026	GS - III	Science & Technology

MARKS	WORD LIMIT
10	~150 words

Answer Hint

Satellite-to-device connectivity; Low Earth Orbit satellites; remote-area coverage; digital divide; spectrum allocation; regulatory framework; affordability; terrestrial–satellite integration

Model Answer

Introduction

Satellite-to-mobile communication seeks to connect compatible mobile devices directly through satellites, potentially extending connectivity beyond the reach of conventional cellular towers.

Potential Benefits

1. Bridging the Digital Divide: Satellite connectivity can support communication in remote, mountainous and sparsely populated regions where terrestrial networks are expensive to deploy.

2. Disaster Resilience: It can provide alternative communication channels when floods, earthquakes or cyclones damage ground-based infrastructure.

3. Wider Digital Access: Integration with existing mobile networks may expand access to digital services, including education, healthcare and financial services.

Major Challenges

1. Technical Limitations: Satellite services face constraints involving signal strength, device compatibility, indoor reception, network capacity and latency.

2. Spectrum and Regulation: Coordination is necessary to prevent harmful interference and ensure compliance with national licensing requirements and international spectrum rules.

3. Affordability and Competition: Infrastructure costs and service pricing may limit adoption. Cooperation between satellite operators and telecom companies may reshape competition and investment.

Way Forward

India should promote transparent spectrum allocation, interoperability, consumer protection and affordable connectivity while encouraging innovation and investment in both satellite and terrestrial networks.

Conclusion

Satellite-to-mobile technology can complement conventional telecom infrastructure and improve connectivity, but its success depends on technical reliability, sound regulation and affordable services.

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