Geography · GS - I

"Tundra regions are ecologically fragile but economically important." Examine this statement critically.

EXAM YEAR	PAPER	SUBJECT
2026	GS - I	Geography

MARKS	WORD LIMIT
10	~150 words

Answer Hint

Arctic and sub-Arctic regions, permafrost, biodiversity, fragile ecosystems, oil and gas, minerals, fisheries, indigenous communities, climate change, resource extraction, environmental risks, sustainable development

Model Answer

Tundra regions, found mainly across the Arctic and sub-Arctic, possess extremely low temperatures, short growing seasons and permafrost, making them among the world's most fragile ecosystems. At the same time, their natural resources give them considerable economic importance.

Ecologically, tundra supports specialised biodiversity, including mosses, lichens, migratory birds and cold-adapted mammals. Permafrost also stores vast quantities of carbon. However, its low biological productivity makes recovery from disturbance extremely slow. Climate change and permafrost thaw further threaten ecological stability.

Economically, tundra regions contain significant reserves of oil, natural gas, minerals and fisheries. Melting sea ice is also increasing the accessibility of Arctic maritime routes and resource frontiers. Indigenous communities depend on these ecosystems for traditional livelihoods.

However, mining, hydrocarbon extraction and infrastructure development can cause habitat destruction, pollution and accelerated permafrost degradation, creating a conflict between short-term economic gains and long-term ecological security.

Therefore, economic utilisation of tundra regions requires strict environmental regulation, climate-sensitive infrastructure and participation of indigenous communities to ensure sustainable development.

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