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Q46

What is the common characteristic of the chemical substances generally known as CL- 20, HMX and LLM-105, which are sometimes talked about in media? (a) These are alternatives to hydro- fluorocarbon refrigerants (b) These are explosives in military weapons (c) These are high- energy fuels for cruise missiles (d) These are fuels for rocket propulsion Official key: B.

UPSC Civil Services Prelims 2025 · General Studies · 2 marks · Current Affairs and GK
Current events, government schemes, miscellaneous GK - Prelims GS Paper I.

Explanation

(a)

Alternatives to hydrofluorocarbon refrigerants. Those substitutes are a different family (HFOs and similar). **CL-20**, **HMX** and **LLM-105** are energetic nitramines, not cooling gases.

(b) Official key

Explosives in military weapons. **CL-20** (hexanitrohexaazaisowurtzitane), **HMX** (**octogen**) and **LLM-105** are high-energy nitramine explosives used in munitions. That is the shared characteristic.

(c)

High-energy fuels for cruise missiles. These compounds are explosives, not cruise-missile propellants. **HMX** can appear in some energetic fills, which is why this option sits next to the key.

(d)

Fuels for rocket propulsion. **HMX** is used in some rocket propellant grains. **CL-20** and **LLM-105** are classed as explosives, not a shared rocket-fuel family.

Summary

- **Official key is (b):** **CL-20**, **HMX** and **LLM-105** are military high explosives. They are not HFC refrigerant substitutes. Rocket or cruise-missile fuel is the neighbour trap because **HMX** also appears in some propellant grains.

Related possible facts

These can be asked in a future Prelims paper.

CL-20

Hexanitrohexaazaisowurtzitane. A cage nitramine; among the most powerful non-nuclear explosives. Shock-sensitive.

HMX (octogen)

High Melting Explosive. More powerful than RDX. Used in munitions and some rocket propellants. Basis of SEBEX 2 in the news.

LLM-105

2,6-diamino-3,5-dinitropyrazine-1-oxide. An insensitive high explosive: high energy with lower sensitivity.

RDX (cyclonite)

The older nitramine neighbour of HMX. Standard military explosive; often paired with HMX in PYQs.

SEBEX 2

An Indian high-explosive fill reported as HMX-based, which is why this trio was in the news.

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