

08/09

1. Consider the following statements about Scramjet engine technology.

1. A scramjet engine operates at subsonic speed.
2. Scramjet engine uses Oxygen from the atmospheric air

Which of the statements given above is/are correct?

- A. 1 only
- B. 2 only
- C. Both 1 and 2
- D. Neither 1 nor 2

Answer: **B**

Explanation:

Statement 1 is incorrect: A scramjet engine is an improvement over the ramjet engine as it efficiently operates at **hypersonic** speeds and allows supersonic combustion. Thus it is known as Supersonic Combustion Ramjet, or Scramjet.

Statement 2 is correct: Scramjet engine uses Hydrogen as fuel and the **Oxygen from the atmospheric air**. This makes the system much lighter, more efficient and cost effective.

Scramjet Engine Technology

- As of now, satellites are launched into orbit by multi-staged satellite launch vehicles that can be used only once (expendable).
- These launch vehicles carry oxidiser along with the fuel for combustion to produce thrust.
- Nearly 70% of the propellant (fuel-oxidiser combination) carried by today's launch vehicles consists of oxidiser.
- Launch vehicles designed for one time use are expensive and their efficiency is low because they can carry only 2-4% of their lift-off mass to orbit. Thus, there is a worldwide effort to reduce the launch cost.
- Therefore, the next generation launch vehicles must use a propulsion system which can utilise the atmospheric oxygen during their flight through the atmosphere which will considerably reduce the total propellant required to place a satellite in orbit.
- Ramjet, Scramjet and Dual Mode Ramjet (DMRJ) are the three concepts of air-breathing engines which are being developed by various space agencies.

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- A ramjet is a form of air-breathing jet engine that uses the vehicle's forward motion to compress incoming air for combustion without a rotating compressor.
- Fuel is injected in the combustion chamber where it mixes with the hot compressed air and ignites. A ramjet-powered vehicle requires assisted take-off like a rocket assist to accelerate it to a speed where it begins to produce thrust.
- Ramjets work most efficiently at supersonic speeds around Mach 3 (three times the speed of sound) and can operate up to speeds of Mach 6. However, the ramjet efficiency starts to drop when the vehicle reaches hypersonic speeds.

<https://www.thehindu.com/news/national/drdo-successfully-tests-hypersonic-technology-demonstrator-vehicle/article32541422.ece>

2. The objective of the Kiran helpline is

- A. Mental Health
- B. Agriculture
- C. Weather change
- D. Child protection

Answer: A

Explanation:

- It is a toll-free helpline number to enable access **to mental health resources**.
- The “**Kiran**” mental health rehabilitation helpline number, 1800-599-0019, will provide callers support for early screening, first-aid, psychological support, distress management, mental well-being, preventing deviant behaviours and psychological crisis management.
- It targets to resolve issues of people across the country experiencing stress, anxiety, depression, panic attack, adjustment disorder, post-traumatic stress disorder, substance abuse, suicidal thoughts, pandemic-induced psychological issues and mental health emergency.

<https://www.thehindu.com/sci-tech/health/centre-launches-247-toll-free-mental-health-helpline/article32545325.ece>

3. Consider the following statements about Indian Meteorological Department (IMD)

1. It functions under Ministry of Earth Sciences.
2. It does not deal with seismology

Which of the statements given above is/are correct?

- A. 1 only
- B. 2 only

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- C. Both 1 and 2
- D. Neither 1 nor 2

Answer: A

Explanation:

- **Statement 1 is correct:** It was formed in 1875 and it functions **under Ministry of Earth Sciences**.
- **Statement 2 is incorrect:** It is national meteorological service of the country and chief government agency dealing in everything related to **meteorology, seismology and associated subjects**.
- **IMD**
- Undertake meteorological observations and provide current information and forecasting information for most favorable operation of weather-dependent activities such as irrigation, agriculture, aviation, shipping etc.
- Offer warning against severe weather phenomenon such as tropical cyclones, norwesters, dust storms, heat waves, cold waves, heavy rains, heavy snow, etc.
- Provide met-related statistics needed for agriculture, industries, water resources management, oil exploration, and any other strategically important activities for the country.
- Engage in research in meteorology and allied subjects.
- Detect and locate earthquakes and evaluate of seismicity in various parts of the country for developmental projects.

<https://www.thehindu.com/news/national/august-rainfall-highest-since-1926-imd/article32546214.ece>

4. K V Kamath Committee, sometimes seen in the news, is related to

- A. Defence indigenization
- B. Healthcare reforms
- C. Educational reforms
- D. Restructuring of loans

Answer: D

Explanation:

- The Reserve Bank of India (RBI) has set up a committee headed by **K.V. Kamath** on **restructuring of loans impacted by the Covid-19 pandemic**.

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- The Committee is tasked to recommend parameters for one-time restructuring of corporate loans. The Committee will formulate sector-specific resolution plans for all accounts with total loan exposure of Rs.1,500 crore and above.
- A large number of firms that otherwise maintain a good track record are facing the challenge as their debt burden is becoming disproportionate, relative to their cash flow generation abilities.
- This can potentially impact their long-term viability and pose significant financial stability risks if it becomes widespread. It may also lead to an increase in Non-Performing Assets.

<https://www.pressreader.com/india/the-hindu/20200908/282226603129008>

5. Which of the following organizations will prepare the multidimensional poverty index?

- A. Ministry of Finance
- B. Ministry Of Human Resource Development
- C. NITI Aayog
- D. Ministry of Health and Family Welfare

Answer: C

Explanation:

- **NITI Aayog is at an advanced stage for preparation of a Multidimensional Poverty Index (MPI)** parameter dashboard to rank states and Union Territories, along with a State Reform Action Plan (SRAP).
- The Aayog, which is the nodal agency for leveraging the monitoring mechanism of the Global MPI to drive reforms, has set up a coordination committee comprising members from different ministries and departments in this regard.
- The Global MPI is part of the government's decision to monitor the performance of the country on 29 select global indices.
- The objective of the Global Indices to Drive Reforms and Growth (GIRG) exercise is to fulfil the need to measure and monitor India's performance on various important social and economic parameters and enable the utilisation of these indices as tools for self-improvement, bring about reforms in policies, while improving last-mile implementation of government schemes
- Global MPI is an international measure of multidimensional poverty covering 107 developing countries. It was first developed in 2010 by Oxford Poverty and Human Development Initiative and United Nations Development Programme for UNDP's Human Development Reports.

<https://indianexpress.com/article/business/niti-aayog-preparing-multidimensional-poverty-index-to-rank-states-uts-6587120/>