

EVA STALIN IAS ACADEMY – BEST IAS COACHING IN CHENNAI

12/24, Muthurangan Muthali St, West Tambaram, Chennai - 600045

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Q1. Consider the following statements regarding rare earth elements:

1. Rare earth elements are a set of 17 chemical elements in the periodic table that have similar chemical properties.
2. Rare earth elements are not radioactive in nature.
3. They are used in space shuttle components, jet engine turbines, and drones.

How many of the statements given above is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Ans: (b)

Explanation:

- Rare earth elements or rare earth metals are a set of 17 chemical elements in the periodic table — the 15 lanthanides, plus scandium and yttrium, which tend to occur in the same ore deposits as the lanthanides, and have similar chemical properties.
- The 17 rare earths are cerium (Ce), dysprosium (Dy), erbium (Er), europium (Eu), gadolinium (Gd), holmium (Ho), lanthanum (La), lutetium (Lu), neodymium (Nd), praseodymium (Pr), promethium (Pm), samarium (Sm), scandium (Sc), terbium (Tb), thulium (Tm), ytterbium (Yb), and yttrium (Y).
- Despite their classification, most of these elements are not really “rare”. One of the rare earths, promethium, is radioactive.
- These elements are important in technologies of consumer electronics, computers and networks, communications, clean energy, advanced transportation, healthcare, environmental mitigation, and national defence, among others.
- Scandium is used in televisions and fluorescent lamps, and yttrium is used in drugs to treat rheumatoid arthritis and cancer. Rare earth elements are used in space shuttle components, jet engine turbines, and drones. Cerium, the most abundant rare earth element, is essential to NASA’s Space Shuttle Programme.

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Q2. Consider the following statements regarding NavIC:

1. It is an independent stand-alone navigation satellite system developed by the Indian Space Research Organisation (ISRO).
2. It covers the whole of India's landmass and up to 15,000 km from its boundaries.
3. It is being used in public vehicle tracking in India, for providing emergency warning alerts to fishermen venturing into the deep sea.
4. Galileo from the European Union, China's Beidou and QZSS operated by Japan are some of the navigation systems that have global coverage.

How many of the above given statement(s) is/are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Ans: (b)

Explanation:

- NavIC, or Navigation with Indian Constellation, is an independent stand-alone navigation satellite system developed by the Indian Space Research Organisation (ISRO).
- NavIC consists of eight satellites and covers the whole of India's landmass and up to 1,500 km (930 miles) from its boundaries.
- Currently, NavIC's use is limited. It is being used in public vehicle tracking in India, for providing emergency warning alerts to fishermen venturing into the deep sea where there is no terrestrial network connectivity, and for tracking and providing information related to natural disasters.

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• **HOW DOES NavIC COMPARE?**

- The main difference is the serviceable area covered by these systems. GPS caters to users across the globe and its satellites circle the earth twice a day, while NavIC is currently for use in India and adjacent areas.
- Like GPS, there are three more navigation systems that have global coverage – Galileo from the European Union, Russia-owned GLONASS and China's Beidou. QZSS, operated by Japan, is another regional navigation system covering Asia-Oceania region, with a focus on Japan.

Q3. India's rubber industry plays a significant role in the country's economy. Consider the following statements about India's rubber industry:

1. India is one of the largest producers of natural rubber in the world.
2. The majority of India's rubber production is used for the manufacturing of tires.
3. Kerala is the leading rubber-producing state in India.
4. India's rubber industry heavily relies on imported raw materials.

How many of the statements given above is/are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Ans: (d)

Explanation:

- S2: The tyre sector consumes the majority of the rubber, accounting for over 50% of India's total production. Despite being one of the main producers of rubber, India still buys rubber from other countries. India imports 50000 tonnes of rubber every year approximately.
- S1 and S4: India is the fourth largest producer of natural rubber in the world and is the second largest consumer of natural rubber.

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- S3: Kerala is the largest producer of natural rubber in India

Q4. With reference to the current trends in the cultivation of sugarcane in India, consider the following statements:

1. A substantial saving in seed material is made when ‘bud chip settlings are raised in a nursery and transplanted in the main field.
2. When direct planting of sets is done, the germination percentage is better with single-budded sets as compared to sets with many buds.
3. If bad weather conditions prevail when setts are directly planted, single-budded setts have better survival as compared to large setts.
4. Sugarcane can be cultivated using settlings prepared from tissue culture.

Which of the statements given above is/are correct ?

- (a) 1 and 2 only
- (b) 3 only
- (c) 1 and 4 only
- (d) 2,3 and 4 only

Ans: (c)

Explanation:

- Conventional method of sugarcane planting requires 7 to 8 tonnes of seed cane per hectare and this is the main reason for slow rate of seed and varietal replacement. Sugarcane being a long duration crop and heavy biomass producer requires about 1500 to 2500 mm water.
- Keeping in mind the likely to be faced situations in future, the ICAR-Sugarcane Breeding Institute (ICAR-SBI) has developed an integrated sugarcane cultivation model called Settling Transplanting Technology (STT).
- **Components of the model are listed below:**
- High yielding and better quality varieties

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- Raising and transplanting of settlings derived from single bud setts/ bud chips
 - Sub-surface drip irrigation and fertigation
 - Wider row planting
 - Intercropping
 - Trash mulching
 - Multiple ratooning
 - Mechanization
- S1: Transplanting sugarcane single-bud/ bud-chip settlings can save seed cane requirement up to 80 per cent besides providing healthy plants and good field establishment. It is less expensive and labour saving in comparison with conventional sett planting.
- Other options are spaced transplanting (STP) and polybag / pro-tray nursery.
- S2 and S3: Reverse is true. See here <http://www.iisr.nic.in/download/publications/ijst-December-2011.pdf>
- S4: Yes, tissue culture or vegetative propagation (a subset of TC), can be used to germinate and grow these settlings which can be transplanted in the field later.

Q5. In which one of the following groups are all the four countries members of G20?

- (a) Argentina, Mexico, South Africa and Turkey
- (b) Australia, Canada, Malaysia and New Zealand
- (c) Brazil, Iran, Saudi Arabia and Vietnam
- (d) Indonesia, Japan, Singapore and South Korea

Ans: (d)

Explanation:

- The members of the G20 are: Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Republic of Korea, Mexico, Russia, Saudi Arabia, South Africa, Türkiye, the United Kingdom, the United States, the African Union and the European Union.