

Q: Consider the following statement regarding Debrigarh Wildlife Sanctuary:

1. It finds a special mention because of noted freedom fighter Veer Surendra Sai.
2. It has a dry deciduous forest.
3. It is located near Godavari River.

Choose the correct option from the codes given below:

- a) 1 and 2
- b) 2 and 3
- c) 1 and 3
- d) 1, 2 and 3

Ans: a

Explanation:

- Debrigarh Wildlife Sanctuary is located between the Hirakud Dam (Mahanadi River) and the Reservoir in the state of Odisha.
- It was declared a wildlife sanctuary in 1985.
- It finds a special mention because of noted freedom fighter Veer Surendra Sai.
- During his rebellion against the British Veer Surendra Saimade his base at ‘Barapathara’ located within the sanctuary.
- The beautiful sanctuary is known for its easy sightings of animals particularly Indian Bison, Wild Boars and Sambhar etc.
- It has a dry deciduous forest that attracts a host of birds during the winters.

Q: Consider the following statement regarding Auroras:

1. In southern hemisphere is called Aurora Borealis.
2. The sun is ejecting charged particles from its corona, creating solar wind.
3. The hemispheric asymmetry of the aurora is due in part to the sun's magnetic field interfering with Earth's magnetic field.

Choose the correct option from the codes given below:

- a) 1 and 2
- b) 2 and 3
- c) 1 and 3
- d) 1, 2 and 3

Ans: b

Explanation:

- The sun is ejecting charged particles from its corona, creating solar wind. When that wind slams into Earth's ionosphere, the aurora is born.
- In the Northern Hemisphere, the phenomenon is called the northern lights (aurora borealis), while in the Southern Hemisphere, it's called the southern lights (aurora australis).
- The hemispheric asymmetry of the aurora is due in part to the sun's magnetic field interfering with Earth's magnetic field.
- The usually observed green and red auroras happen between 100 kilometres and 250 kilometres above the surface of the planet due to an excited state of atomic oxygen.

Q: Consider the following statement regarding Chiral Bose-Liquid State:

1. It exist in solid, liquid or gas forms.
2. The top layer is electron-rich, and these electrons can move freely.

Choose the correct option from the codes given below:

- a) 1 Only
- b) 2 Only
- c) 1 and 2
- d) None of the above

Ans: c

Explanation:

- Chiral Bose-Liquid State is usually matter that exists in solid, liquid or gas forms.
- At temperatures approaching absolute zero, or the world within the atom, things are very different.
- In these “quantum” states, matter behaves in ways quite different from the solid, liquid, and gaseous states.
- Under frustrated quantum systems, where infinite possibilities result from the interaction of particles.
- Researchers used a bi-layer semiconducting device.
- The top layer is electron-rich, and these electrons can move freely.
- The bottom layer is filled with “holes,” or places that a roving electron can occupy.

Q: Consider the following statement regarding Air Independent Propulsion (AIP) System

1. It allows the submarines to stay for longer hours in water.
2. It decreases the noise levels made by the submarines.
3. AIP is mostly implemented as an auxiliary source.

Choose the correct option from the codes given below:

- a) 1 and 2
- b) 2 and 3
- c) 1 and 3
- d) 1, 2 and 3

Ans: d

Explanation:

- AIP is mostly implemented as an auxiliary source, with the traditional diesel engine handling surface propulsion.
- Most of these systems generate electricity, which in turn drives an electric motor for propulsion or recharges the boat’s batteries.
- AIP allows longer submergence than a conventionally propelled submarine. A typical conventional power plant provides 3 megawatts maximum, and an AIP source around 10 per cent of that. A nuclear submarine’s propulsion plant is much greater than 20 megawatts.
- It allows the submarines to stay for longer hours in water. The submarines need to come to the surface of the water to charge their batteries. This is reduced by AIP System.
- It decreases the noise levels made by the submarines. This makes it hard to detect the submarines.

Q: Consider the following statement regarding INS Sunayna:

1. It is a Saryu class Offshore Patrol Vessel.
2. The ship also has an automatic power management system.
3. It is not supported by Electronic Support Systems.

Choose the correct option from the codes given below:

- a) 1 and 2
- b) 2 and 3
- c) 1 and 3
- d) 1, 2 and 3

Ans: a

Explanation:

- INS Sunayna is a Saryu class Offshore Patrol Vessel which was commissioned at Kochi.
- It is based under Southern Naval Command and is built at Goa Shipyard Limited.
- The warship is designed to undertake fleet support operations, coastal and offshore patrolling, ocean surveillance and monitoring of Sea Lines of Communications and offshore assets, and escort duties.
- It can achieve speeds of 25 knots.
- The ship also has an automatic power management system.
- It is fitted with the latest Navigation, Communication and Electronic Support Systems.
- Other Sarayu class includes the INS Sumitra and INS Sumedha.