November 5, 2018

Q.1) Consider the following statements about 'Hydrazine'

1. It is a molecule of nitrogen atoms and hydrogen atoms
2. It is used as rocket fuel propellant
3. It acts as an oxygen scavenger

Select the correct statements

a) 1 and 2
b) 2 and 3
c) 1 and 3
d) All of the above

Q.1) Solution (d)

News: Dawn spacecraft finally ran out of hydrazine, the fuel that enables the spacecraft to control its pointing, ending a historic 11-year mission.

Hydrazine is a molecule of two singly-bonded nitrogen atoms and four peripheral hydrogen atoms. In its anhydrous form, it is a colourless, toxic irritant and sensitiser, which damages the central nervous system, producing symptoms as extreme as tumours and seizures. The pungent smell of hydrazine is not unlike that of ammonia, and it is so powerful a reducing agent that it is highly explosive.

Hydrazine can even be found in fossil fuels and nuclear power stations. As a powerful reducing agent, it acts as an oxygen scavenger, reducing metal oxides back into metals, and literally turning the chemical clock back on corrosion processes.

The explosive nature of hydrazine has been put to good use, too. Sodium azide, the compound that activates car air bags, is manufactured directly from hydrazine and sodium nitrate. Sodium azide decomposes rapidly when it gets warm, creating huge volumes of nitrogen gas.

Hydrazine is also used as rocket fuel propellant. Mixing it with oxidising agent dinitrogen tetroxide, N_2O_4, creates a hypergolic mixture – a mixture so explosive, no ignition is required. As the fuel burns, three reactions take place, decomposing hydrazine into ammonia, nitrogen and hydrogen gases. Within milliseconds, the reaction chamber can exceed 800°C due to these extremely exothermic reactions. Ammonia is also broken down – this is endothermic and takes away some of the heat energy, but produces more nitrogen and hydrogen gases that are forced out of the rocket through a tight nozzle to create thrust.

Source: https://www.thehindu.com/sci-tech/science/nasas-historic-dawn-mission-to-asteroid-belt-comes-to-end/article25403872.ece

Q.2) Consider the following statements

1. Indian nationality law largely follows the 'jus sanguinis' as opposed to the 'jus soli'
2. In the U.S. children obtain their citizenship through the legal principle of 'jus soli'.

Select the correct statements

a) 1 Only
b) 2 Only
c) Both 1 and 2
d) Neither 1 nor 2

Q.2) Solution (c)

Indian nationality law largely follows the jus sanguinis (citizenship by right of blood) as opposed to the jus soli (citizenship by right of birth within the territory). The President of India is termed the First Citizen of India.

USA's president Trump has advocated of striking down jus soli, the right to citizenship by birth derived from the common law

The principle guarantees that a child born on US soil is automatically a full citizen, irrespective of the citizenship status of its parents

Q.3) Consider the following statements about 'Veer Surendra Sai'

1. He resisted the British and successfully protected most parts of Western Odisha region for some time
2. He died during the 1857 Sepoy Mutiny

Select the correct statements

a) 1 Only
b) 2 Only
c) Both 1 and 2
d) Neither 1 nor 2

Q.3) Solution (a)

Surendra Sai was an Indian freedom fighter and tribal leader who sacrificed his life fighting against the British East India Company.[1] Surendra Sai and his associates Madho Singh,

Kunjal Singh, Airi Singh, Bairi Singh, Uddant Sai, Ujjal Sai, Khageswar Dao, Salegram Bariha, Govind Singh, Pahar Singh, Rajee Ghasia, Kamal Singh, Hati Singh, Salik Ram Bariha, Loknath Panda/Gadtia, Mrutunjaya Panigrahi, Jagabandu Hota, Padmanave Guru, Trilochan Panigrahi and many others resisted the British and successfully protected most parts of Western Odisha region for some time from the British rule.[2] Most of them died unnoticed fighting for freedom from the British. Many of them were hanged by the British; a few died in the Cellular Jail in the Andamans. Surendra Sai died in Asirgarh Jail on 23 May 1884.

Q.4) _____ has launched the world's first sovereign blue bond.

a) Seychelles
b) Mauritius
c) Maldives
d) Haiti

Q.4) Solution (a)

Republic of Seychelles has launched the world's first sovereign blue bond—a pioneering financial instrument designed to support sustainable marine and fisheries projects.

The bond, which raised US$15 million from international investors, demonstrates the potential for countries to harness capital markets for financing the sustainable use of marine resources. The World Bank assisted in developing the blue bond and reaching out to the three investors: Calvert Impact Capital, Nuveen, and U.S. Headquartered Prudential Financial, Inc.

The Blue Bond is a part of an initiative that combines public and private investment to mobilise resources for empowering local communities and businesses.

It is aimed to assist Seychelles in achieving a transition to sustainable fisheries and safeguarding oceans.

Source: https://www.worldbank.org/en/news/press-release/2018/10/29/seychelles-launches-worlds-first-sovereign-blue-bond

Q.5) Cyclical Unemployment is the:

a) Unemployment that results when people become discouraged about their chances of finding a job so that they stop looking for work
b) Unemployment that occurs during recessions and depressions.

c) Portion of unemployment that is due to the normal working of the labour market.
d) Portion of unemployment that is due to changes in the structure of the economy that results in a significant loss of jobs in certain industries.

Q.5) Solution (b)

Cyclical or demand deficient unemployment occurs when the economy is in need of low workforce. When there is an economy-wide decline in aggregate demand for goods and services, employment declines and unemployment correspondingly increases. Cyclical unemployment mainly occurs during recession or depression. This form of unemployment is most commonly known as cyclical unemployment since unemployment moves with the trade cycle. For instance, during the recent global slowdown in late 2008, many workers around the globe lost their jobs.