



Daily Current Affairs Prelims Quiz 12-01-2022 - (Online Prelims Test)

1) Consider the following statements regarding 5G technology:

1. It operates in two bands namely the low band spectrum and high band spectrum.
2. In the low band spectrum, the maximum speed is limited to 100 Mbps while in high band it is 20Gbps.
3. It operates in the millimeter-wave spectrum ranging between 40-400 GHz.

Which of the above statement(s) is/are correct?

- a. 1 and 2 only
- b. 2 only
- c. 3 only
- d. 1, 2 and 3

Answer : b

The three private telecom service providers, Bharti Airtel, Reliance Jio Infocomm, and Vodafone Idea, have been working with telecom equipment makers such as Ericsson and Nokia, and conducting 5G trials at test sites in metro cities.

5G Technology

- It is the next generation of mobile broadband that will eventually replace the 4G LTE connection.
- It operates in the millimeter wave spectrum of 30-300 GHz which have the advantage of sending large amounts of data at very high speeds.

The Spectrums

- It operates in 3 bands, namely low, mid and high frequency spectrum.
- Low Band Spectrum
 - While the low-band spectrum has shown great promise in terms of coverage, the maximum Internet speed is limited to 100 Mbps (megabits per second).
 - This means that while telcos can use and install it for commercial cellphone users who may not have specific demands for very high speed Internet, the low-band spectrum may not be optimal for specialised needs of industries.
- Mid Band Spectrum
 - The mid-band spectrum offers higher speeds than low-band, but has limitations in terms of coverage area and penetration of signals.
 - Telcos and companies that have taken the lead on 5G have indicated this band may be used by industries and specialised factory units for building captive networks.
- High Band Spectrum
 - High-band offers the highest speed among the three, but has extremely limited coverage and signal penetration strength.

- Speeds in this spectrum have been tested to be as high as 20 Gbps (gigabits per second), while in most cases, the maximum Internet data speed in 4G has been recorded at 1 Gbps.

Benefits of 5G Technology

- Users will be able to stream videos with multiple camera angles during sports matches or even play immersive video games using VR headsets or other accessories.
- This next-generation telecom network will also enable a mesh of connected Internet of Things (IoT)-enabled devices and services with zero-fail rate, as in the case of connected cars.
- 5G could also spawn high-speed mobile broadband connectivity to replace existing broadband services, especially in locations where these services are constrained, provided there isn't a huge price differential.

2) Consider the following statements:

1. One of the causes of Dementia is HIV infection, which damages the brain cells.
2. It affects the memory, thinking, comprehension and leads to loss of consciousness forcing the patient into coma.
3. There is currently no treatment available to cure dementia.

Which of the above statement(s) is/are correct?

- a. 1 and 3 only
- b. 2 and 3 only
- c. 2 only
- d. 3 only

Answer : a

Dementia cases in India to double by 2050, Lancet study shows. Worldwide, the caseload is set to almost triple by 2050.

Dementia

- It is serious mental problem caused by brain disease or injury.
- When brain cells are damaged then dementia may occur. It can be caused by a head injury, a stroke, a brain tumor or due to HIV infection.
- It is chronic or progressive in nature that leads to deterioration in cognitive function i.e. the ability to process thought, beyond what might be expected from the usual consequences of biological ageing.
- It affects memory, thinking, orientation, comprehension, calculation, learning capacity, language, and judgement.
- Dementia does not affect the consciousness of the individual.
- 65% of total deaths due to dementia are women.
- Worldwide Dementia is the seventh leading cause of death among all diseases and one of the major causes of disability.

Symptoms

- Memory loss, Difficulties with thinking, Visual perception, problem solving or language and the loss in ability to focus and pay attention.
- Personality changes, like depression, agitation, paranoia and mood swings.

Treatment

- There is no treatment available to cure dementia at present.
- Various treatments are being investigated under various levels of clinical trials.

3) Consider the following statements regarding Insulin:

1. Islets, that produces insulin, are destroyed when a person is suffering from type II diabetes.
2. Type I diabetes occurs when a person's body does not produce insulin, as the immune system attacks and destroys the cells in pancreas.
3. India is the second largest country with diabetic patients in the world after China.

Which of the above statement(s) is/correct?

- a. 1 and 3 only
- b. 2 only
- c. 2 and 3 only
- d. 1, 2 and 3

Answer : c

100 years of insulin use. Insulin treated its first patient in 1922, before which, those suffering from type I diabetes were rarely expected to live longer than a year or two after detection.

Diabetes

- It is a metabolic disease or a condition in which the glucose levels in the blood will be high over a prolonged period of time.
- Blood sugar levels are controlled by a hormone called insulin.
- It is caused due to the insufficient production of insulin by the pancreas or it may occur if the cells of the body are not effectively responding to the insulin produced.
- **Diabetes Mellitus Type 1:** occurs when the pancreas fails to produce sufficient insulin which thereby causes an increase in glucose level in urine and blood.
- Islets, a cluster of cells in the pancreas that produces insulin, are destroyed when a person is suffering from type I diabetes.
- **Diabetes Mellitus Type 2:** occurs when the person who suffers from obesity and lack of exercise and are genetically biased.
- **Diabetes Insipidus:** occurs when the body is unable to respond or produce the Antidiuretic hormone(ADH), which is secreted by the hypothalamus.
- This hormone help the kidneys manage the amount of water in the human body.
- **Gestational Diabetes:** occurs in pregnant women who develop high blood sugar level without a previous history. This condition usually resolves after delivery.
- India is home to more than 70 million diabetes people, it is the second-highest in the world after China.

4) Consider the following statements with respect to Biomining:

1. Biomining is the process of using microorganisms to extract metals of economic interest from rock ores or mine waste.
2. The microorganisms actually facilitate the extraction of metals from sulfide or iron-containing ores.
3. Biomining is usually done on metals like cadmium and calcium.

Which of the above statement(s) is/are correct?

- a. 3 only
- b. 2 and 3 only
- c. 1 and 2 only

d. 1, 2 and 3

Answer : c

3,000 tonnes of waste to be handled per day at Brahmpuram waste plant in Kerala using the Biomining Technique.

Biomining

- Biomining is the process of using microorganisms (microbes) to extract metals of economic interest from rock ores or mine waste.
- Biomining techniques may also be used to clean up sites that have been polluted with metals.
- The microorganisms actually facilitate the extraction of metals from sulfide or iron-containing ores.
- Metals solubilization process is involved in biomining and it is a combination of microbiology and chemistry.
- Bioremediation is the use of microorganisms (bacteria and fungi) to degrade the environmental contaminants into less toxic or nontoxic forms.
- Metals for which this technique is employed included Copper, Nickel, Zinc, Uranium, Gold and Silver.

Methods used

- Bio Leaching
 - Low-grade ore is dumped into a heap called leach pile and then soaked with a weak sulfuric acid wash.
 - The acid then reacts with the ores sulfide matrix and encourages the growth of bacterial strain which starts to degrade ore and releases minerals or metals in fluid form.
- Bio-oxidation
 - Widely used for extracting gold from ores.
 - It involves exposing the ore to bacterial oxidation which degrades the insoluble pyrite and arsenic components as it a precious metal only removal of interfering metal sulfides from ore.
 - It leaves metal in solid phase and solution is discarded.

5) Identify the statement associated with 'Grime-Eating Bacteria':

- a. They are used in restoring old art works, since they consume the dirt settled on the surface of the art work.
- b. They are bacteria which decompose the rocks into sand and help in the weathering process.
- c. They consume the juice secreted by the gallbladder, causing serious threat of life in individuals affected.
- d. They are used to decompose the medical waste and reduce them to ashes.

Answer : a

At present art restores are using grime-eating bacteria to clean the art works.

Grime-Eating Bacteria

- Art restorers have usually employed chemical agents and, more recently laser techniques, to remove dirt, oil, glue, or pollutants from monuments, stone works, and paintings.
- Since the 1980s, when researchers first used the bacteria *Desulfovibrio vulgaris* to clean a marble monument at the Cave Hill Cemetery in Louisville, US, the role of micro-organisms has been recognized in protecting the artistic heritage of humanity.
- There is a general notion that bacteria are harmful. But not all are pathogens.

- These bacteria are not modified or genetically engineered.
- They are just common ones from natural environments that love to eat various proteins.
- The Archaeological Survey of India is learnt to be exploring the option of employing bio-restoration at the Taj.



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