



Down To Earth August

Question 1:

Consider the following statements regarding Human Immunodeficiency Virus (HIV):

1. HIV cannot be removed, once it enters the body.
2. A person with 'Undetectable HIV' can also transfer to another person upon transfer of fluids.
3. The South Asian Region is the most affected region with 1 in 25 adults living with HIV.

Which of the statements given above is/are correct?

1. 1 and 2 only
2. 2 and 3 only
3. 1 only
4. 1, 2 and 3

Correct Answer : 3

Explanation

- The **Human Immunodeficiency Virus (HIV)** attacks CD4, a type of White Blood Cell (T cells) in the body's immune system.
 - T cells are those cells that move around the body detecting anomalies and infections in cells.
 - After entering the body, HIV multiplies itself and destroys CD4 cells, thus severely damaging the human immune system.
 - Once this virus enters the body, it can never be removed. **Hence, statement 1 is correct.**
- HIV is transmitted from person to person through bodily fluids including blood, semen, vaginal secretions, anal fluids and breast milk.
- To transmit HIV, bodily fluids must contain enough of the virus. **A person with 'Undetectable H=OV' cannot transfer HIV** to another person even after transfer of fluids. **Hence, statement 2 is not correct.**
 - 'Undetectable HIV' is when the amount of HIV in the body is so low that a blood test cannot detect it. Treatment can make this possible. But regular monitoring of the same through

blood tests is also required.

- Since the beginning of the epidemic, more than 70 million people have got infected with HIV virus and about 35 million have died.
 - According to Global HIV & AIDS statistics, only 59% of those infected with HIV are receiving the antiretroviral drugs.
 - The **African Region is the most affected region** with 1 in 25 adults living with HIV. **Hence, statement 3 is not correct.**
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Question 2:

Consider the following statements:

1. Globally, India is the third largest producer of wool.
2. The state of Rajasthan is known for producing the Chokla and Magra wool.
3. Around 85% of India's wool production accounts for carpet grade wool.

Which of the statements given above is/are correct?

1. 1 and 2 only
2. 2 and 3 only
3. 3 only
4. 1, 2 and 3

Correct Answer : 4

Explanation

- Under the National Livestock Mission, the Government of India approved funds to three states - Uttarakhand, Himachal Pradesh and Jammu & Kashmir - for importing the Australian Merino sheep, known to have the softest and finest wool used for apparels.
 - Plans are also underway to import sheep for **Rajasthan, the country's largest wool producer** known for its superior **carpet grade Chokla and Magra wool. Hence, statement 2 is correct.**
 - Chokla is a world-class carpet grade wool.
- **Carpet grade wool** is rougher than apparel grade and **accounts for 85% of India's production. Hence, statement 3 is correct.**
 - Apparel grade wool accounts for less than 5% of production, and coarse grade fit for making rough blankets accounts for the rest.
- As per the **20th Livestock Census in 2019, India has the third largest number of sheep in the world** (after China and Australia) with 74.26 million sheep under 42 registered breeds.

Hence, statement 1 is correct.

- This was a 14.1% increase from the previous census in 2012.
 - Data with the Union Ministry of Textiles suggests that as of 2018-19, the average annual yield per sheep in India was 0.9 kg as against the world average of 2.4 kg.
 - The country produced 40.42 million kg of wool in 2018-19, whereas its consumption was at 260.8 million kg in 2019-20.
 - Due to this insufficient domestic production, India depends on imports for raw wool, particularly on Australia and New Zealand.
 - This wool is then used to prepare products like carpets, yarn, fabrics and garments for the domestic market and for exporting, especially to the US and Europe.
 - One reason for this disparity is that despite the overall rise in sheep population, their numbers are declining in major wool-producing states like Himachal Pradesh, Rajasthan, Gujarat, Andhra Pradesh, and Jammu & Kashmir.
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Question 3:

Consider the following pairs:

	Zoonotic Diseases	Pathogens
1.	Plague	Bacteria
2.	Rabies	Ectoparasites
3.	Leishmaniasis	Protozoa

Which of the pairs given above is/are correctly matched?

1. 1 only
2. 1 and 2 only
3. 3 only
4. 1 and 3 only

Correct Answer : 4

Explanation

- The World Health Organisation (WHO) in 1959 defined that Zoonoses are those diseases and infections which are naturally transmitted between vertebrate animals and man.
 - Zoonoses may be bacterial, viral, or parasitic, or may involve unconventional agents.
- Classification of Zoonoses according to the Etiological (Originating) Agents:

- **Bacterial zoonoses:** e.g. anthrax, brucellosis, **plague**, leptospirosis, salmonellosis, lyme disease. **Hence, Pair 1 is correctly matched.**
 - **Viral zoonoses:** e.g. **rabies**, arbovirus infections, KFD, yellow fever, influenza
 - **Ectoparasites: e.g. scabies, myiasis. Hence, Pair 2 is not correctly matched.**
 - Rickettsial zoonoses: e.g. murine typhus, tick typhus, scrub typhus, Q-fever
 - **Protozoan zoonoses:** e.g. toxoplasmosis, trypanosomiasis, **leishmaniasis. Hence, Pair 3 is correctly matched.**
 - Helminthic zoonoses: e.g. echinococcosis (hydatid disease), taeniasis
 - Fungal zoonose: s e.g. deep mycosis - histoplasmosis, cryptococcosis
- **Hence, option D is correct.**
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Question 4:

Consider the following statements regarding the Mekong river:

1. Mekong is the longest river in Asia.
2. It originates from China and flows through Laos, Thailand, Vietnam and Cambodia.
3. The Mekong River Commission comprises Cambodia and Vietnam only.

Which of the statements given above is/are correct?

1. 1 only
2. 2 only
3. 1 and 2 only
4. 1, 2 and 3

Correct Answer : 2

Explanation

- The **Mekong River**, also known as Lancang in China is the **longest river in Southeast Asia**, the **7th longest in Asia**, and the 12th longest in the world. **Hence, statement 1 is not correct.**
 - It has a length of about 2,700 miles (4,350 km).
- **Rising in southeastern Qinghai province, China**, it flows through the eastern part of the Tibet Autonomous Region and Yunnan province.
 - It forms part of the international border between **Myanmar (Burma) and Laos**, as well as between **Laos and Thailand**.
 - The river flows through **Laos, Cambodia, and Vietnam** before draining into the South China Sea. **Hence, statement 2 is correct.**
- Mekong is an important source of electricity for these countries.

- China has built 11 giant dams on it and has partnered with Cambodia for another 140.
 - Thailand, Laos and Cambodia can meet their energy demand and carbon dioxide emission targets for 2016-2037 by constructing only 82% (14.5 GW) of the planned 17.6 GW hydro power plants on the Mekong river.
 - For this, the countries need solar Photovoltaic and cross border power trading, which could increase cost by up to 2.4% but would substantially limit the fragmentation of additional river reaches.
 - The **Mekong River Commission**, an inter-governmental body, says water level was at its lowest in 2019.
 - It has emphasised on the need of more scientific evidence to establish whether dams caused a 2019 drought.
 - The Mekong River Commission **comprises Cambodia, Laos, Thailand and Vietnam. Hence, statement 3 is not correct.**
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Question 5:

Which of the following statements is/are correct regarding the Shield Volcanoes?

1. They have relatively steeper sides and are more cone-shaped than the stratovolcanoes.
2. Shield volcanoes are non-explosive in nature and pose little to no risk to humans.
3. Mount Fuji is the tallest shield volcano on earth.

Which of the statements given above is/are not correct?

1. 1 and 3 only
2. 2 only
3. 3 only
4. 2 and 3 only

Correct Answer : 1

Explanation

- When magma erupts at the surface as lava, it can form different types of volcano depending on the viscosity and composition of the magma.
 - There are two broad types of volcano, a **stratovolcano and a shield volcano**.
 - Other volcanic features can also form from erupted magma such as cinder cones or lava domes.
- A **Shield Volcano** is a **volcano with gentle slopes** formed when another volcano produces low

viscosity, runny lava which spreads far from the source. **Hence, statement 1 is not correct.**

- Most shield volcanoes are formed from fluid, basaltic lava flows.
 - **Stratovolcanoes have relatively steep sides** and are more cone-shaped than shield volcanoes.
 - They are formed from viscous, sticky lava that does not flow easily.
 - Many of the largest volcanoes on Earth are shield volcanoes.
 - **Mauna Loa is the world's largest active volcano**, rising over 9 km above the sea floor around the island of Hawai'i. **Hence, statement 3 is not correct.**
 - **Mount Fuji is a 3,776 metres tall stratovolcano.**
 - The Piton de la Fournaise, on Reunion Island, is one of the more active shield volcanoes on earth, with one eruption per year on average.
 - Unlike composite volcanoes, which are formed of rock, ash and debris and result in massive eruptions, **shield volcanoes are non-explosive.**
 - Due to their non-violent eruptions, **shield volcanoes pose little to no risk to humans. Hence, statement 2 is correct.**
 - However, the lava can destroy agriculture and infrastructure as it spreads.
 - Stratovolcanoes are more likely to produce explosive eruptions due to gas building up in the viscous magma.
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Question 6:

Consider the following statements:

1. Alphaherpesviruses are pathogens that establish lifelong infections in the nervous system of humans.
2. Monkey B virus is an alphaherpesvirus endemic in macaques.

Which of the statements given above is/are correct?

1. 1 only
2. 2 only
3. Both 1 and 2
4. Neither 1 nor 2

Correct Answer : 3

Explanation

- **Monkey B virus is an alphaherpesvirus enzootic (endemic) in macaques** and it was initially isolated in 1932. **Hence, statement 2 is correct.**
 - Alphaherpesviruses are pathogens or neuroinvasive viruses that **establish lifelong infections in the peripheral nervous system of humans** and many other vertebrates. **Hence, statement 1 is correct.**
 - B virus is also commonly referred to as herpes B, herpesvirus simiae, and herpesvirus B.
 - B virus can survive for hours on surfaces, particularly when moist.
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Question 7:

Which of the following is/are the consequences of the use of Steroids?

1. Severe Inflammation
2. Diabetes
3. Cytokine Storms

Select the correct answer using the code given below:

1. 1 and 2 only
2. 2 only
3. 2 and 3 only
4. 1, 2 and 3

Correct Answer : 2

Explanation

- The human immune system is the sole fighter in Covid-19 and does not have any prior experience of eliminating the virus.
 - In such conditions, the immune system could get hyperactive resulting in an inflammatory response.
 - The inflammatory reaction can even damage the body's own healthy tissues and organs, a condition known as cytokine storm.
- In such cases, **Steroids are used to prevent severe inflammation and cytokine storms.**
 - They assuage the hyperactive immune system and thereby, **keep inflammation under control and block the deadly cytokine storm.**
- Steroids are essentially synthetic compounds that mimic various natural hormones in humans, and act as chemical messengers to regulate basic actions necessary to protect, nourish and maintain the body as well as functions of the reproductive system.

- Corticosteroids are the steroids used in the treatment of covid-19 and other infectious diseases.
 - **Corticosteroids can result in a range of side effects**, from indigestion and sleep disorders to **serious complications like diabetes** and damaged liver function.
 - Since they work by suppressing the immune system, they can also make one susceptible to a range of other avoidable infections, especially shingles, chickenpox and measles.
 - **Hence, option B is correct.**
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Question 8:

Consider the following statements regarding silent hypoxia:

1. In this condition, patients have extremely low blood oxygen levels, yet they do not show signs of breathlessness.
2. Silent hypoxia is often observed as a post-covid-pneumonia condition.

Which of the statements given above is/are not correct?

1. 1 only
2. 2 only
3. Both 1 and 2
4. Neither 1 nor 2

Correct Answer : 2

Explanation

- Hypoxia is a condition wherein there is not enough oxygen available to the blood and body tissues.
 - It can either be generalised, affecting the whole body, or local, affecting a region of the body
 - An hyperactive immune response can activate factors that induce hypoxia, which in turn, can cause a cytokine storm.
 - Pulmonary edema, a life-threatening condition caused by hypoxia in the mountains.
- Amidst the ongoing Covid-19 pandemic, medical practitioners have reported a condition called **silent or happy hypoxia**, in which **patients have extremely low blood oxygen levels, yet they do not show signs of breathlessness. Hence, statement 1 is correct.**
 - It is a form of oxygen deprivation that is harder to detect than regular hypoxis because patients appear to be less in distress.
- **Covid pneumonia**, a serious medical condition found in severe Covid-19 patients, is **preceded by silent hypoxia. Hence, statement 2 is not correct.**

Question 9:

The 'Kandhamal Haldi' received a geographical indication (GI) tag belonging to which of the following states?

1. Odisha
2. West Bengal
3. Assam
4. Meghalaya

Correct Answer : 1

Explanation

- The **first Odia product** to receive a GI tag was **Kandhamal Haldi**, a type of turmeric produced by tribal farmers in the **state's Kandhamal district**.
 - The region's native turmeric variety remains unmatched in its golden hue and intense aroma. It is also famous for its healing properties.
 - The cultivation of the turmeric begins around March with the collection of leaf litter of Sal tree (*Shorea robusta*) from the hilly forests.
 - For the tribal communities dwelling in the hills of central Odisha, who own small landholdings and sell forest produce like honey, arrowroot and tamarind, turmeric is a major source of cash income.
 - In 1998, Kandhamal Apex Spices Association for Marketing (KASAM), a non-profit society was set up by the state government for promoting the spice in domestic as well as international markets.
 - **Hence, option A is correct.**
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Question 10:

Consider the following statements regarding Aeroponics:

1. It is an indoor farming technique for growing plants in soil-free conditions.
2. It is a water and fertilizer intensive technique.
3. The use of pesticides is completely eliminated in this technique.

Which of the statements given above is/are correct?

1. 1 only
2. 2 and 3 only
3. 1 and 3 only
4. 1, 2 and 3

Correct Answer : 3

Explanation

- **Aeroponics is an indoor farming technique** in which **plants grow in a controlled environment that is free from soil** or any other aggregate media. **Hence, statement 1 is correct.**
 - Roots hang suspended in the air while a nutrient solution is sprayed as a fine mist. Spraying is a specialised process which, through clock-work precision and factory-like settings, can imitate plant growth across multi-level chambers, which remain lit by led lights of different calibrations.
- Such a system does not require much land and can be set up in a vertical manner.
 - The **water usage in the system reduces by an impressive 98%.**
 - Since the roots get the nutrients directly, **fertiliser usage also decreases by 60%. Hence, statement 2 is not correct.**
 - **Pesticides are fully eliminated**, as the absence of soil reduces chances of diseases. **Hence, statement 3 is correct.**
- The technique has also opened up the possibility of food self-sufficiency for countries like Singapore that have till now been import economies and do not have the resources, notably land, freshwater and labour, to grow food.
- In India, which is land surplus and has a large agricultural population, the technology has so far been the mainstay of a few specialised industries and research laboratories, particularly those producing potato tubers.
- However, such a system is technology-intensive and quite expensive to set up; it can cost around `Rs. 8 crore per hectare.
 - Also, Crops get affected even if there is a 15-minute disruption in electricity supply or watering cycle.
 - The temperature also needs to be maintained at the ideal level.