Daily MCQs: 17-05-2024

1. Consider the following statements about Sacred groves.

1. Sacred groves comprise patches of forests or natural vegetation that are usually dedicated to local folk deities.
2. A strong concentration of these groves is found in Himachal Pradesh and Kerala.

Which of the above statements is/are correct?

A. 1 only
B. 2 only
C. Both 1 and 2
D. Neither 1 nor 2

2. 3D Printing has applications in which of the following?

1) Customisation of implants
2) Manufacture of hearing aids
3) Construction industry

Select the correct answer using the code given below

A) 1 and 2 only
B) 2 and 3 only
C) 1 and 3 only
D) 1,2 and 3

3. A fungus commonly used as a biocontrol agent against plant pathogens is:

A) Aspergillus niger
B) Bacillus thuringiensis
C) Escherichia coli
D) Trichoderma

4. 'Kalapani' is a disputed territory between India and which one of the following countries?

A) Myanmar
B) Bangladesh
C) Pakistan
D) Nepal

5. Consider the following statements about exoplanets

1) Planets that orbit around another planet are called exoplanets.
2) No exoplanet has been found so far by any scientists

Which of the statements given above is/are correct?

a) 1 only
b) 2 only

c) Both 1 and 2
d) Neither 1 nor 2

Solutions:

1. Answer: C

Explanation

- **Statement 1 is correct:** Sacred groves comprise patches of forests or natural vegetation – from a few trees to forests of several acres – that are **usually dedicated to local folk deities.**
- These spaces are **protected by local communities** because of their religious beliefs and traditional rituals that run through several generations.
- **Statement 2 is correct:** A strong concentration of these groves is found in **Himachal Pradesh and Kerala.**

Significance

- **Conservation of Biodiversity:** The sacred groves are important repositories of floral and faunal diversity that have been conserved by local communities in a sustainable manner. They are often the last refuge of endemic species in the geographical region.
- **Recharge of aquifers:** The groves are often associated with ponds, streams or springs, which help meet the water requirements of the local people. The vegetative cover also helps in recharging the aquifers.
- **Soil conservation**: The vegetation cover of the sacred groves improves the soil stability of the area and also prevents soil erosion.
- **Source of local medicine:** The local tribal population rely upon some plants in the sacred groves to heal themselves.
- **Carbon sink:** The groves act as an effective carbon sink and are also a self-sustainable ecosystem, which reinforce scientific reasons for conservation.

Threats

- Increasingly, the sacred groves are facing threats from the biotic pressure due to **weakening of traditional taboos and belief systems and invasion of exotic weeds.**
- **Indiscriminate grazing** in the last few decades, **uncontrolled felling of trees** for firewood and **urbanization** have also contributed to the dwindling of groves.

2. Answer: D

Explanation

What is 3D printing?

- 3D printing is a process that **uses computer-created design** to **make three-dimensional objects layer by layer.**
- It is an **additive process**, in which layers of a material like plastic, composites or bio-materials are built up to construct objects that range in shape, size, rigidity, and colour.

How is 3D printing done?

- To carry out 3D printing a personal computer connected to a 3D printer is required. A **3D model of the required object is designed on computer-aid design (CAD) software.**
- **3D printers** construct the desired object by using a **layering method,** which is the complete opposite of the subtractive manufacturing processes.
- 3D printers **build from the bottom up by piling on layer after layer** until the object looks exactly like it was envisioned.
- The (3D) printer acts generally the same as a traditional inkjet printer in the direct 3D printing process, where a nozzle moves back and forth while dispensing a wax or plastic-like polymer layer-by-layer, waiting for that layer to dry, then adding the next level.
- It essentially **adds hundreds or thousands of 2D prints on top of one another to make a three-dimensional object.**

Applications

All the statements are correct.

- These machines are capable of printing anything from ordinary objects like a ball or a spoon to complex moving parts like hinges and wheels.
- **Medical sciences:** 3D printing is being used to customize implants. It is used in the manufacture of hearing aids.
- **Construction industry:** Companies around the world are making breakthroughs in 3D printing of the materials needed to build homes.

What's in the news?

- Indian Space Research Organisation (ISRO) successfully tested a liquid rocket engine made with the help of additive manufacturing technology, commonly known as 3D printing.

Why did ISRO use 3D printing to build the PS4 engine?

- The technology helped ISRO **bring down the number of parts in the engine** from 14 to a single piece.
- The space agency was able to eliminate 19 weld joints and **saved 97% of raw material**.
- It also **reduced** the **overall production time by 60%**.

3. Answer: D

Explanation

- Biocontrol agents are the **organisms or microorganisms that control the plant pathogen.**
- They play a key role in **resisting pest populations** and **prevent the crop from various diseases** like leaf wilt, curling of disease, root rot disease, crown gall disease, etc.
- They **kill the pest population before they spread the disease.**
- Many **bacteria (Bacillus sp., Pseudomonas sp., etc.) and fungi (Trichoderma sp., Candida sp. etc.)** are used as biocontrol agents.
- The major benefit of these biocontrol agents is that the hosts do not consume them, and thus the host organism remains unaffected.

4. Answer: D

Explanation

- The bone of contention is the **Kalapani-Limpiadhura-Lipulekh trijunction** between Nepal-India.
- Located on the **banks of the river Kali** at an altitude of 3600m, the Kalapani territory lies at the **eastern border of Uttarakhand** in India and **Nepal's Sudurpashchim Pradesh in the West.**
- India claims the area is part of Uttarakhand's Pithoragarh district, while Nepal believes it to be part of its Dharchula district.

5. Answer: D

Explanation

- **Statement 1 is incorrect:** All of the planets in our solar system **orbit around the Sun**. **Planets that orbit around other stars are called exoplanets.**
- Exoplanets are **very hard to see directly with telescopes.** They are hidden by the bright glare of the stars they orbit.
- So, astronomers use **other ways** to detect and study these distant planets. They search for exoplanets by looking at the **effects these planets have on the stars they orbit.**
- **Statement 2 is incorrect:** The first exoplanets were discovered in the 1990s and since then we've identified thousands using a variety of detection methods.

Tracing of Exoplanets

- One way to search for exoplanets is to look for **"wobbly" stars**. A star that has planets doesn't orbit perfectly around its center. From far away, this off-center orbit makes the star look like it's wobbling.
- Hundreds of planets have been discovered using this method. However, **only big planets**—like Jupiter, or even larger—can be seen this way. **Smaller Earth-like planets are much harder to find** because they create only small wobbles that are hard to detect.
- In 2009, **NASA** launched a spacecraft called **Kepler** to look for exoplanets. Kepler looked for planets in a wide range of sizes and orbits. And these planets orbited around stars that varied in size and temperature.
- Some of the planets discovered by Kepler are **rocky planets** that are at a very special distance from their star. This sweet spot is called the **habitable zone**, where life might be possible.
- Kepler detected exoplanets using something called the **transit method**. When a planet passes in front of its star, it's called a transit. As the planet transits in front of the star, it **blocks out a little bit of the star's light**. That means a star will look a little less bright when the planet passes in front of it. Astronomers can observe how the brightness of the star changes during a transit. This can help them figure out the size of the planet.