

Q: Consider the following statement regarding Anthrobots:

1. These are constructed from human tracheal cells.
2. These are capable of both movement and healing neurons within a laboratory setting.
3. These are similar to Xenobots.

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:

- Anthrobots are constructed from human tracheal cells which are bio-robots that possess self-assembly capabilities.
- These are capable of both movement and healing neurons within a laboratory setting.
- They can spontaneously fuse together to form a larger structure called a superbot, which was able to encourage the growth of neurons.
- They are measuring between the width of a human hair and the tip of a sharpened pencil.
- The anthrobots displayed diversity in structure and behavior. Some took on a spherical shape fully covered in cilia, while others resembled a football shape irregularly adorned with cilia.
- These anthrobots are different from Xenobots, which are created from embryonic stem cells of frog.

Q: Consider the following statement regarding Dopamine:

1. It is found in vertebrates only.
2. It is a neurotransmitter.
3. It is a chemical messenger that helps in the transmission of signals in the brain and other vital areas.

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:

- Dopamine is a neurotransmitter.
- It is a chemical messenger that helps in the transmission of signals in the brain and other vital areas.
- It is found in humans as well as animals, including both vertebrates and invertebrates.
- It plays a role as a “reward center” and in many body functions, including memory, movement, motivation, mood, attention, and more.
- Dopamine is released when your brain is expecting a reward. When you come to associate a certain activity with pleasure, mere anticipation may be enough to raise dopamine levels.
- Dysfunction of the dopamine system has been implicated in different nervous system diseases.

Q: Consider the following statement regarding Piezoelectricity:

1. It is associated with static electricity.
2. Substance like quartz, ceramics such as lead zirconate and certain biological substances can generate an electric charge in response to mechanical stress.

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:

- The term “piezoelectric” originates from the Greek words “piezein,” meaning ‘to squeeze’, and “elektron”, for amber, a material known for its association with static electricity.
- Piezoelectricity is a remarkable phenomenon whereby some materials, including quartz, ceramics such as lead zirconate titanate (PZT), and even certain biological substances like bone and tendons, can generate an electric charge in response to mechanical stress.
- This property is the result of their unusual crystal structures.

Q: Consider the following statement regarding Mohenjo Daro:

1. It was built around the same time as the Great Pyramids of Egypt.
2. It is laid out in a rectilinear grid and built out of baked bricks.
3. It was divided into citadel and the lower town.

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:

- Mohenjo Daro, or "Mound of the Dead" is an ancient Indus Valley Civilization city that flourished between 2600 and 1900 BCE.
- It lies in Pakistan's Sindh province, on the bank of the Indus River.
- It was built around the same time as the Great Pyramids of Egypt.
- The ruins were designated a UNESCO World Heritage Site in 1980.
- Laid out in a rectilinear grid and built out of baked bricks, the city featured a complex water management system, complete with a sophisticated drainage and covered sewer system, and baths in nearly every house.
- Mohenjo-Daro, like its contemporaries (Kalibangan and Harappa), was also divided into two parts: the citadel and the lower town.

Q: Consider the following statement regarding De Winton's Golden Mole:

1. It is an elusive blind mole that "swims" through sand.
2. Its natural habitats are subtropical dry shrubland, Mediterranean-type shrubby vegetation, and sandy shores.
3. It is endemic to India.

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:

- De Winton's Golden Mole is an elusive blind mole that "swims" through sand, lives in inaccessible burrows, and has a shimmering, iridescent coat.
- It is endemic to South Africa.
- It has only ever been recorded in one location-Port Nolloth, on South Africa's northwest coast-where it was last sighted in 1937.
- Its natural habitats are subtropical dry shrubland, Mediterranean-type shrubby vegetation, and sandy shores.