

SCIENCE & TECHNOLOGY UPSC PRE 2020

Question 1. With reference to solar water pumps, consider the following statements :

1. Solar power can be used for running surface pumps and not for submersible pumps.
2. Solar power can be used for running centrifugal pumps and not the ones with piston .

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

Answer: (d)

Question 2. With reference to the current trends in the cultivation of sugarcane in India, consider the following statements :

1. A substantial saving in seed material is made when 'bud chip settlings' are raised in a nursery and transplanted in the main field.
2. When direct planting of setts is done, the germination percentage is better with single-budded setts as compared to setts with many buds.
3. If bad weather conditions prevail when setts are directly planted, single-budded setts have better survival as compared to large setts.
4. Sugarcane can be cultivated using settlings prepared from tissue culture.

Which of the statements given above is/are correct?

- (a) 1 and 2 only (b) 3 only (c) 1 and 4 only (d) 2, 3 and 4 only

Answer:

Question 3. With reference to carbon nanotubes, consider the following statements :

1. They can be used as carriers of drugs and antigens in the human body.
2. They can be made into artificial blood capillaries for an injured part of human body.
3. They can be used in biochemical sensors.
4. Carbon nanotubes are biodegradable. Which of the statements given above are correct?

- (a) 1 and 2 only (b) 2, 3 and 4 only (c) 1, 3 and 4 only (d) 1, 2, 3 and 4

Answer

Question 4. Consider the following activities:

1. Spraying pesticides on a crop field
2. Inspecting the craters of active volcanoes
3. Collecting breath samples from spouting whales for DNA analysis

At the present level of technology, which of the above activities can be successfully carried out by using drones?

- (a) 1 and 2 only (b) 2 and 3 only (c) 1 and 3 only (d) 1, 2 and 3

Answer

Question 5. "The experiment will employ a trio spacecraft flying in formation in the shape of an equilateral triangle that has sides one million kilometres long, with lasers shining between the craft. The experiment in question refers to

- (a) Voyager-2 (b) New Horizons (c) LISA Pathfinder (d) Evolved LISA

Answer-(c) LISA Pathfinder

Question 6. Consider the following statements:

1. Genetic changes can be introduced in the cells that produce eggs or sperms of a prospective parent.
2. A person's genome can be edited before birth at the early embryonic stage.
3. Human induced pluripotent stem cells can be injected into the embryo of a pig. Which of the statements given above is/are correct?

- (a) 1 only (b) 2 and 3 only (c) 2 only (d) 1, 2 and 3

Answer

Question 7. What is the importance of using Pneumococcal Conjugate Vaccines in India ?

1. These vaccines are effective against pneumonia as well as meningitis and sepsis.
2. Dependence on antibiotics that are not effective against drug-resistant bacteria can be reduced.
3. These vaccines have no side effects and cause no allergic reactions.

Select the correct answer using the code given below:

(a) Car 1 only (b) 1 and 2 only (c) 3 only (d) 1, 2 and 3

Answer

Question 8. In India, the term "Public Key Infrastructure" is used in the context of

- (a) Digital security infrastructure
- (b) Food security infrastructure
- (c) Health care and education infrastructure
- (d) Telecommunication and transportation infrastructure

Answer

Question 9. Which of the following statements are correct regarding the general difference between plant and animal cells?

- 1. Plant cells have cellulose cell walls whilst animal cells do not.
- 2. Plant cells do not have plasma membrane unlike animal cells which do.
- 3. Mature plant cell has one large vacuole.

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

Answer

Question 10. In the context of recent advances in human reproductive technology, "Pronuclear Transfer" is used for

- (a) fertilization of egg in vitro by the donor sperm
- (b) genetic modification of sperm producing cells
- (c) development of stem cells into functional embryos
- (d) prevention of mitochondrial diseases in offspring

Answer-(a) fertilization of egg in vitro by the donor sperm

Question 11. With the present state of development, Artificial Intelligence can effectively do which of the following?

- 1. Bring down electricity consumption in industrial units
- 2. Create meaningful short stories and songs
- 3. Disease diagnosis
- 4. Text-to-Speech Conversion
- 5. Wireless transmission of electrical energy

Select the correct answer using the code given below :

- (a) 1, 2, 3 and 5 only (b) 1, 3 and 4 only (c) 2, 4 and 5 only (d) 1, 2, 3, 4 and 5

Answer(d) 1, 2, 3, 4 and 5

Question 12. With reference to Visible Light Communication (VLC) technology, which of the following statements are correct?

- 1. VLC uses electromagnetic spectrum wavelengths 375 to 780 nm.
- 2. VLC is known as long-range optical wireless communication.
- 3. VLC can transmit large amounts of data faster than Bluetooth,
- 4. VLC has no electromagnetic interference.

Select the correct answer using the code given below :

- (a) 1, 2 and 3 only (b) 1, 2 and 4 only (c) 1, 3 and 4 only (d) 2, 3 and 4 only

Answer-Visible light communication (VLC) is a data communications variant which

uses visible light between 400 and 800 THz (780–375 nm). VLC is a subset of optical wireless communications technologies.

Question 13. With reference to "Blockchain Technology". consider the following statements :

- 1. It is a public ledger that everyone can inspect, but which no single user controls.
- 2. The structure and design of blockchain is such that all the data in it are about cryptocurrency only.
- 3. Applications that depend on basic features of blockchain can be developed without anybody's permission.

Which of the statements given above is/are correct?

- (a) 1 only (b) 1 and 2 only (c) 2 only (d) 1 and 3 only

Answer(d) 1 and 3 only