

EVA STALIN IAS ACADEMY – BEST IAS COACHING IN CHENNAI

12/24, Muthurangan Muthali St, West Tambaram, Chennai - 600045

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Q1. Consider the following statements regarding Black Carbon:

- 1) Black carbon is a component of fine particulate matter, formed through the incomplete combustion of fossil fuels, biofuel, and biomass.
- 2) Black carbon increases the albedo when deposited on snow and ice.
- 3) In the tropics, black carbon in soils significantly contributes to the soil fertility.

Which of the above statements is/are correct:

- A. 1, 2
- B. 1, 3
- C. 2, 3
- D. 1 only

• **Solution:**
(B)

- Black carbon (BC) is a component of fine particulate matter.
- Black carbon consists of pure carbon in several linked forms.
- It is formed through the incomplete combustion of fossil fuels, biofuel, and biomass, and is emitted in both anthropogenic and naturally occurring soot.
- Black carbon causes human morbidity and premature mortality.
- In climatology, black carbon is a climate forcing agent.
- Black carbon warms the Earth by absorbing sunlight and heating the atmosphere and by reducing albedo when deposited on snow and ice.
- Black carbon stays in the atmosphere for only several days to weeks, whereas carbon dioxide (CO₂) has an atmospheric lifetime of more than 100 years.
- The term black carbon is also used in soil sciences and geology.
- Especially in the tropics, black carbon in soils significantly contributes to fertility as it is able to absorb important plant nutrients

Q2. Near Field Communications (NFC) technology is used in which among the following applications:

- 1) Baggage identification in Airports
- 2) Contactless card payment
- 3) Healthcare

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4) Metro train cards

Select the correct answer code:

- A. 1, 2, 3
- B. 2, 3, 4
- C. 1, 2, 4
- D. 1, 2, 3, 4

• **Solution:**
(D)

- All of the above given are application of Near Field Communication (NFC) technology.
- Near-field communication is a set of communication protocols that enable two electronic devices, one of which is usually a portable device such as a smartphone, to establish communication by bringing them within 4 cm of each other.

Q3. Consider the following statements regarding “Innate immunity” in human beings:

- 1) It is present at the time of birth.
- 2) It is disease specific due to its memory of disease attack and response.

Which of the above statements is/are correct:

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

• **Solution:**
(A)

- It prevents the entry of the foreign agents into our body when our bodies are weak especially at the time of birth. It remains with us throughout our lives.
- It is “Acquired Immunity” that is disease specific, not innate immunity which is general in nature.

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- This means that our body when it encounters a pathogen for the first time produces a response called primary response which is of low intensity.
- Subsequent encounter with the same pathogen elicits a highly intensified secondary or anamnestic response.
- This is ascribed to the fact that our body appears to have memory of the first encounter.

Q4. Consider the following statements regarding Herd immunity:

- 1) It is the resistance to the spread of a contagious disease within a population.
- 2) It occurs when high proportion of individuals are resistant to the disease.
- 3) It may occur due to immunization or naturally.

Which of the above statements is/are correct:

- A. 2 only
- B. 1, 3
- C. 2, 3
- D. 1, 2, 3

• **Solution:**

- (D)**
- Herd immunity is a form of indirect protection from infectious disease that occurs when a large percentage of a population has become immune to an infection, thereby providing a measure of protection for individuals who are not immune.
 - It is the resistance to the spread of a contagious disease within a population.
 - It occurs when high proportion of individuals are resistant to the disease.
 - It may occur due to immunisation or naturally.
 - Herd immunity depends on the contagiousness of the disease.
 - Diseases that spread easily, such as measles, require a higher number of immune individuals in a community to reach herd immunity.

Q5. Reverse Osmosis Systems can remove:

- 1) Metal ions
- 2) Aqueous salts
- 3) Bacteria

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4) Lead

Select the correct answer code:

- A. 1, 2, 3
- B. 1, 3, 4
- C. 2, 3
- D. 1, 2, 3, 4

• **Solution:**
(D)

- Reverse osmosis can remove many types of dissolved and suspended chemical species as well as biological ones (principally bacteria) from water.
- Reverse Osmosis Systems will remove common chemical contaminants (metal ions, aqueous salts), including sodium, chloride, copper, chromium, and lead; may reduce arsenic, fluoride, radium, sulfate, calcium, magnesium, potassium, nitrate, and phosphorous.

Q6. Consider the following statements regarding Brain fingerprinting:

- 1) Brain fingerprinting is a method of interrogation in which the accused's participation in the crime is investigated by studying their brain's response.
- 2) It is conducted to study the electrical behaviour of the human brain.

Which of the above statements is/are incorrect:

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

• **Solution:**
(D)

- Brain Electrical Oscillation Signature Profiling (BEOSP) also known as brain fingerprinting is a neuro psychological method of interrogation in which the accused's participation in the crime is investigated by studying their brain's response.

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- The BEOSP test is carried out via a process known as electroencephalogram, conducted to study the electrical behaviour of the human brain.
- The BEOSP procedure does not involve a question answer session with the accused and is rather a neuro psychological study of their brain.
- In 2010, the Supreme Court passed a judgment in the Selvi versus State of Karnataka case where the bench observed that narco analysis, polygraph and brain mapping tests cannot be forced upon any individual without their consent and the test results cannot be admitted solely as evidence.
- However, any information or material discovered during the tests can be made part of the evidence, observed the bench.

Q7. Consider the following statements:

- 1) Hydrogen is lighter than air.
- 2) Hydrogen is the most abundant chemical substance in the universe
- 3) In India, Hydrogen is primarily produced from renewable energy sources.

Which of the above statements is/are correct:

- A.** 2 only
- B.** 1, 2
- C.** 1, 3
- D.** 1, 2, 3

• **Solution:**
(B)

- Hydrogen is the lightest element in the periodic table.
- Hydrogen is the most abundant chemical substance in the universe.
- Currently, India consumes around 5.5 million tonnes of hydrogen, primarily produced from imported fossil fuels.

Q8. The term ‘Data Scraping’ sometimes seen in news, rightly denotes:

- A.** Process of deleting data from a website
- B.** Restricting data access from a website

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- C. Process of extracting data from a website
- D. Modifying the original data content in a website

• **Solution:**

(C)

- Data scraping, or web scraping, is the process of extracting data from a website.
- Scraper bots are designed to derive information from these websites.
- A user designing a bot to extract data is called a scraper.

Q9. Consider the following statements regarding Trans fats:

- 1) Trans fatty acids are formed during industrial partial hydrogenation of vegetable oil.
- 2) High intake of Trans fats reduces low density lipoproteins (LDL) and insulin levels.

Which of the above statements is/are correct:

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

• **Solution:**

(A)

- All natural fats and oils are a combination of monounsaturated, polyunsaturated and saturated fatty acids.
- Trans fatty acids are formed during industrial partial hydrogenation of vegetable oil, a process widely commercialized to produce solid fats.
- Trans fat increases low density lipoproteins (LDL), triglycerides and insulin levels and reduces beneficial high density lipoproteins (HDL)

Q10. Consider the following statements:

- 1) A patent is a conferral by the state of an exclusive right to make, use and sell an inventive product or process.

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- 2) Patent laws are usually justified on the ground that people have something of a natural and moral right to claim control over their inventions.

Which of the above statements is/are correct:

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

• **Solution:**

- (C)
- A patent is a conferral by the state of an exclusive right to make, use and sell an inventive product or process.
 - Patent laws are usually justified on three distinct grounds: on the idea that people have something of a natural and moral right to claim control over their inventions; on the utilitarian premise that exclusive licenses promote invention and therefore benefit society as a whole; and on the belief that individuals must be allowed to benefit from the fruits of their labour and merit, that when a person toils to produce an object, the toil and the object become inseparable.

