

# **Chapter - 16**

## **Sustainable Management of Natural Resources**

**Answer the following questions based on the given information.**

Hydrogen gas is an excellent fuel. It has a high calorific value and produces only water as the product of combustion. It is considered to be a potentially important, non-polluting energy source of the future.

Hydrogen is labelled with different 'colours' based on the method by which it is produced, as given below:

- green hydrogen: manufacturing process does not produce carbon dioxide
- blue hydrogen: manufacturing process produces carbon dioxide but it is separated and stored
- grey hydrogen: manufacturing process produces carbon dioxide which is released into the air

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**Q: 1 The widespread use of which type(s) of hydrogen will help in containing global warming?**

- |                                               |                                                |
|-----------------------------------------------|------------------------------------------------|
| <b>1</b> only green hydrogen                  | <b>2</b> only green hydrogen and blue hydrogen |
| <b>3</b> only blue hydrogen and grey hydrogen | <b>4</b> only green hydrogen and grey hydrogen |

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**Q: 2 Hydrogen can be prepared in the laboratory by reacting metals with acids. However, most of the hydrogen manufactured in the industry is by reacting methane with water at a high temperature.**

**Which of the following is the LIKELY reason why the reaction of metals with acids is NOT used to manufacture hydrogen on a large scale?**

- 1** The raw materials used in the metal-acid reaction are expensive.
- 2** The metal-acid reaction requires a high temperature and pressure.
- 3** The hydrogen produced by the metal-acid reaction is acidic in nature.
- 4** The hydrogen produced by the metal-acid reaction has a lower calorific value.

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**Q: 3 Electrolysis of water is another common way of producing hydrogen on an industrial scale.**

**Hydrogen produced by the electrolysis of water CAN be green hydrogen, but NOT ALWAYS. Which of the following correctly explains why?**

- 1** The electrolysis equipment may not have the capacity to capture and store carbon dioxide.
- 2** The hydrogen produced by electrolysis may be used to power polluting industries.
- 3** The use of water for electrolysis can deplete groundwater resources.
- 4** The energy used for electrolysis may be obtained from fossil fuels.

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**Q: 4** Two statements are given - one labelled Assertion (A) and the other labelled Reason (R). Read the statements carefully and choose the option that correctly describes statements A and R.

**Assertion (A):** Hydroelectric power plants are not the primary source of power generation in India.

**Reason (R):** Dams for hydroelectricity generation are best constructed in places with steep altitude gradient.

- 1** Both A and R are true, and R is the correct explanation for A.
- 2** Both A and R are true, but R is not a correct explanation for A.
- 3** A is true, but R is false.
- 4** A is false, but R is true.

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**Q: 5** Which among the following is/are an indication of high contamination in a river?

- (i) low pH of the river water
- (ii) existence of diverse life forms in the river
- (iii) presence of mercury ions in the water
- (iv) presence of E.coli bacteria in water

Choose the correct option from the following:

- |                              |                                    |
|------------------------------|------------------------------------|
| <b>1</b> (i) and (iii)       | <b>2</b> (i) and (iv)              |
| <b>3</b> (i), (iii) and (iv) | <b>4</b> (i), (ii), (iii) and (iv) |

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**Q: 6** Given below are 4 reasons. Identify ones which explain why we need to use our resources carefully.

[2]

- 1. because our needs are increasing
- 2. because all resources are not unlimited
- 3. because the population of humans is increasing rapidly
- 4. because we need to make these resources last for use by future generations



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**Q: 7** Upcycling is a new trend of using waste products in their current form and creating new products. The image below shows an upcycled bottle table lamp. [1]



**State ONE difference between upcycling and recycling.**

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**Q: 8** Rainwater harvesting can be done by storing water in underground recharge wells or at the surface in check dams. [2]

**Give TWO advantages of underground water storage over check dams.**

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**Q: 9** Lily says that deforestation of vast areas and then reforestation by monoculture is not a sustainable way of forest management. [2]

**Give TWO disadvantages of reforestation by monoculture to support Lily's statement.**



The table below gives the correct answer for each multiple-choice question in this test.

| Q.No | Correct Answers |
|------|-----------------|
| 1    | 2               |
| 2    | 1               |
| 3    | 4               |
| 4    | 2               |
| 5    | 3               |



| <b>Q.No</b> | <b>Teacher should award marks if students have done the following:</b>                                                                                                                                                                                                                                                                                                                                              | <b>Marks</b> |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| <b>6</b>    | <b>All 4 given reasons are correct. 0.5 marks can be awarded for identifying each correct reason. So if only 1 reason is identified correctly, give 0.5 marks, 2 reasons = 1 mark, 3 reasons = 1.5 marks and all 4 reasons = 2 marks.</b>                                                                                                                                                                           | <b>2</b>     |
| <b>7</b>    | <b>Re-cycling involves processing waste to convert it into something absolutely new.</b>                                                                                                                                                                                                                                                                                                                            | <b>1</b>     |
| <b>8</b>    | <b>1 mark each for any two advantages:</b><br><br><b>- no water loss to evaporation</b><br><b>- no contamination by human and animal waste</b><br><b>- does not allow breeding of mosquitoes</b><br><br><b>(Accept any other valid point)</b>                                                                                                                                                                       | <b>2</b>     |
| <b>9</b>    | <b>1 mark each for any TWO disadvantages of monoculture forests such as:</b><br><b>- Monocultures decrease biodiversity of an area.</b><br><b>- Monocultures cannot meet the requirements of local community for herbs, medicinal plants, fodder, etc.</b><br><b>- Monocultures lead to decrease in diversity of soil insects and microorganisms.</b><br><b>- Monocultures lead to depletion of soil nutrients.</b> | <b>2</b>     |