

9. (a) Write the reason and consequence of Bhopal gas tragedy.  
 (b) What is green solvent? Give examples.  
 (c) What do you mean by green energy? Write the sources of it.  
 (d) Write the aspects of environment protection act in India.

$$3 + 2 + 1 + 1 + 3 = 12$$

**BASIC ENVIRONMENTAL ENGINEERING & ECOLOGY  
(CHEM 2001)**

**Time Allotted : 3 hrs**

**Full Marks : 70**

*Figures out of the right margin indicate full marks.*

*Candidates are required to answer Group A and  
any 5 (five) from Group B to E, taking at least one from each group.*

*Candidates are required to give answer in their own words as far as  
 practicable.*

**Group – A  
(Multiple Choice Type Questions)**

1. Choose the correct alternative for the following: **10 × 1 = 10**
- (i) The hottest region of atmosphere is
    - (a) magnetosphere
    - (b) stratosphere
    - (c) mesosphere
    - (d) thermosphere.
  - (ii) Wildlife sanctuary is one kind of
    - (a) ex situ conservation
    - (b) hot spot
    - (c) artificial ecosystem
    - (d) in situ conservation.
  - (iii) Which of the following is a symbiotic bacteria?
    - (a) Rhizobium
    - (b) Azotobactor
    - (c) Nitrosomona
    - (d) Micrococcus.
  - (iv) Human ear frequency response is related to the network
    - (a) dBA
    - (b) dBB
    - (c) dBC
    - (d) none of these.
  - (v) A greenhouse gas is
    - (a) H<sub>2</sub>S
    - (b) CO
    - (c) SO<sub>2</sub>
    - (d) H<sub>2</sub> O vapour.
  - (vi) The value of albedo of the earth is
    - (a) 0.31
    - (b) 0.21
    - (c) 0.51
    - (d) 0.41.
  - (vii) Minamata disease is due to
    - (a) mercury pollution
    - (b) cadmium pollution
    - (c) lead pollution
    - (d) tin pollution.
  - (viii) Radioactive waste disposal method usually involve
    - (a) incineration
    - (b) sanitary landfill
    - (c) window composting
    - (d) encapsulation.

- (ix) Temporary hardness in water is due to  
 (a) bicarbonate (b) chloride  
 (c) sulphate (d) phosphate.
- (x) Which of the following poisonous gas was released during Bhopal Gas Tragedy?  
 (a) Arsenic pentafluoride (b) Chlorine  
 (c) Methyl isocyanate (d) Carbon monoxide.

**Group – B**

2. (a) The increase in population from 1 million to 10 million took 200 years. For exponential growth at constant rate find out the growth rate and the doubling time.  
 (b) What are the endemic species to biodiversity? Give example.  
 (c) Give one example of each in situ and ex situ conservation to biodiversity.  
 (d) Give a brief account of sulphur cycle with a schematic diagram.

$$(2 + 2) + (2 + 1) + (1 + 1) + 3 = 12$$

3. (a) Exemplify renewable and non-renewable resources.  
 (b) Define food web? Give one example of food web.  
 (c) According to logistic growth of population explain the term carrying capacity.  
 (d) What is food pyramid? Give one example of each upright and inverted food pyramid.  
 (e) Give a brief account of biological nitrogen fixation.

$$(1 + 1) + (2 + 1) + 2 + (1 + 2) + 2 = 12$$

**Group – C**

4. (a) An air parcel at the surface has a temperature of 25°C and the dew point temperature is 20°C. Under adiabatic condition of movement what will be the temperature at 2000 meters. DALR = -10°C / km and SALR = -8.5°C / km.  
 (b) What are the main constituents of photochemical smog?  
 (c) Give a brief account of greenhouse effect.

- (d) Write short notes on  
 (i) Bag house filter  
 (ii) Maximum mixing depth.

$$3 + 2 + 3 + (2 + 2) = 12$$

5. (a) Is there life on the planet Mars? Explain.  
 (b) Write short notes on:  
 (i) Carbon footprint  
 (ii) Green house gases in atmosphere.  
 (c) What is atmospheric radiation window?  
 (d) What is acid rain? Discuss the harmful effects of acid rain.

$$2 + (2 + 2) + 2 + (1 + 3) = 12$$

**Group – D**

6. (a) What do you mean by Biological Oxygen Demand (BOD)? The BOD<sub>5</sub> of a waste water sample is determined to be 150 mg / L at 20°C and the k value is 0.23 day<sup>-1</sup>. What would be the BOD<sub>8</sub> if the test was run at 35°C?  
 (b) What is hydrologic cycle? What are the components of hydrologic cycle?  
 (c) What is human acoustics?  
 (d) How the loudness of a sound is expressed in terms of intensity?

$$(2 + 3) + (1 + 2) + 2 + 2 = 12$$

7. (a) What is Eutrophication? How can we control Eutrophication?  
 (b) What are the harmful effects of pesticides?  
 (c) Write the basic features of trickling filter.  
 (d) How much a sound of 100 dB louder than a sound of 90 dB?

$$(2 + 2) + 2 + 3 + 3 = 12$$

**Group – E**

8. (a) Write a short note on 'Three Mile Island disaster'.  
 (b) What is cancer? How does cancer develop?  
 (c) Discuss incineration process mentioning advantage and disadvantage.  
 (d) What is waste pile?

$$3 + (1 + 2) + 4 + 2 = 12$$