

**B.TECH/BT/CHE/CSE/IT/3<sup>RD</sup> SEM/CHEM 2001 (BACKLOG)/2020**  
**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) Ozone is a pollutant when present in  
(a) troposphere (b) stratosphere  
(c) mesosphere (d) ionosphere.
- (ii) Gene bank is one kind of  
(a) ex situ conservation (b) hot spot  
(c) artificial ecosystem (d) in situ conservation.
- (iii) Temporary hardness of water is due to the presence of  
(a) Cl<sup>-</sup> (b) SO<sub>4</sub><sup>2-</sup> (c) PO<sub>4</sub><sup>3-</sup> (d) HCO<sub>3</sub><sup>-</sup>
- (iv) Human speech lies in the range  
(a) 20-20000 Hz (b) 2000-5500 Hz  
(c) 200-3000 Hz (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) Flow of energy in an ecosystem is  
(a) unidirectional (b) cyclic  
(c) unidirectional or cyclic (d) cannot be said.
- (vii) The recommended maximum TDS concentration of drinking water according to WHO is  
(a) 1000mg/l (b) 500mg/l  
(c) 1500mg/l (d) none of these.
- (viii) Dioxin a carcinogen may be a by product during the disposal method  
(a) incineration (b) sanitary landfill  
(c) window composting (d) encapsulation.

- (ix) Which of the following can be used for disinfecting water?  
(a) Chlorine (b) Hydrogen peroxide  
(c) Formalin (d) None of these.
- (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 is endemic species to biodiversity? Give example.  
(c) What is food web? Give one example of food web.  
(d) Give brief account of carbon cycle showing schematic diagram.  
 $(2 + 2) + (1 + 1) + (1 + 2) + 3 = 12$
3. (a) Prove that, when population growth follows logistic function,  $N = K/2$  for maximum sustainable yield, where the symbols have their usual meaning.  
(b) Define eco system. Discuss the biotic and abiotic components of a terrestrial eco system mentioning their correlation.  
(c) What do you mean by macro and micro nutrients?  
(d) What is photoautotroph? Give example.  
 $3 + (2 + 3) + 2 + 2 = 12$

### **Group - C**

4. (a) Give a brief account of greenhouse effect.  
(b) How sulphurous smog is formed? What are the effects of sulphurous smog?  
(c) Write a short note on (i) Kyoto Protocol. (ii) Cyclone separator.  
 $3 + (2 + 3) + (2 + 2) = 12$
5. (a) Write the reactions involved during formation of acid rain.  
(b) What is global warming? What are effects of global warming?  
(c) What are the effects of ozone layer depletion? What is importance of Montreal protocol on control of CFC?  
 $3 + (2 + 3) + (2 + 2) = 12$

### **Group - D**

6. (a) What do you mean by Biological Oxygen Demand? Prove the relation  $BOD_t = C_0(1 - e^{-kt})$  where all the terms have their usual significance. A waste water

sample has BOD<sub>5</sub> at 20°C equal to 200 mg/l and its ultimate BOD is 400 mg/l. Find the BOD<sub>5</sub> at 35°C.

- (b) What is human acoustics?  
(c) How the loudness of a sound is expressed in terms of intensity? What are the values of threshold of hearing and threshold of pain in terms of sound intensity?  
**(1 + 2 + 3) + 2 + (2 + 2) = 12**

7. (a) Describe with figure different kinds of aquifers.  
(b) What are the sources of mercury (Hg) contamination in water? Describe the biochemical effects of the above heavy metal.  
(c) How much a sound of 150dB is louder than a sound of 100dB?  
(d) What are the technical processes for controlling noise pollution?  
**3 + (1 + 2) + 3 + 3 = 12**

### **Group – E**

8. (a) Write a short note on Chernobyl Disaster.  
(b) What is cancer? How does cancer develop?  
(c) What is recycling? Discuss how some valuable products can be obtained by recycling of solid waste materials.  
(d) What is waste pile?  
**3 + (1 + 2) + (1 + 3) + 2 = 12**
9. (a) What are the main objectives of Environment Protection Act, 1986 of India?  
(b) What are the requirements of Green Chemistry in today's scientific world?  
(c) What are the biomedical wastes? What is the best way to dispose biomedical wastes?  
(d) Discuss with diagram the working principle of modern sanitary landfill process for the safe disposal of solid waste.  
**3 + 3 + (1 + 1) + 4 = 12**

<b>Google classroom link</b>	<a href="https://classroom.google.com/c/Mjk3NTg4NDg2MTYy?cjc=penqzlg">https://classroom.google.com/c/Mjk3NTg4NDg2MTYy?cjc=penqzlg</a>
<b>EXAM LING</b>	<a href="https://classroom.google.com/c/Mjk3NTg4NDg2MTYy/a/Mjk3NTk5OTk3ODg2/details">https://classroom.google.com/c/Mjk3NTg4NDg2MTYy/a/Mjk3NTk5OTk3ODg2/details</a>