

Printed Pages : 3



EEV401

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 197401

Roll No.

--	--	--	--	--	--	--	--	--	--

B. Tech.

(SEM. IV) THEORY EXAMINATION, 2014-15
ENVIRONMENTAL CHEMISTRY AND MICROBIOLOGY

Time : 3 Hours]

[Total Marks : 100

- Note :**
- (1) Attempt all questions.
 - (2) All questions carry equal marks.
 - (3) Be precise in your answers.

1 Attempt any Two of the following: **10x2**

- (a) How would you broadly divide the major regions of atmosphere? State their respective altitude and temperature ranges.
- (b) How the prokaryotic cells are different from eukaryotic cells?
- (c) Name several applied areas of microbiology. Describe the importance of microorganisms in each of these applied fields.

- 2** Attempt any Two of the following: **10x2**
- (a) Discuss the structure of water molecule. Why does the density of the water in liquid phase higher than that of solid phase?
 - (b) Define importance of water chemistry in environmental engineering. Also explain the role of microorganisms in natural water and wastewater.
 - (c) Discuss the availability and quality aspects of water resources.
- 3** Attempt any Four of the following: **5x4**
- (a) Explain the combustion related air pollution.
 - (b) What is ozone hole? How ozone is depleted in stratosphere?
 - (c) What is "Green House Effect" and why is it a major global environmental issue these days?
 - (d) Describe the chemistry of water pollution due to pesticides with its effects on environment.
 - (e) What is acid rain? What are the causes and effects on acid rain?
 - (f) Discuss El-Nino, phenomenon and its effects on global scale.
- 4** Attempt any Four of the following: **5x4**
- (a) Explain the microbial transformation of carbon in the soil.
 - (b) Discuss functions and chemical composition of various regions of a bacterial cell.

- (c) How do the microorganisms interact in the natural environment?
- (d) Describe bioremediation in detail with suitable examples.
- (e) Draw a neat and clean sketch of bacterial cell.
- (f) Write short note on the following:
 - (i) Biodegradation
 - (ii) Nitrogen fixing bacteria from soil

5 Attempt any Four of the following : **5x4**

- (a) Describe the methods of isolating pure cultures.
- (b) Why do we need to preserve the cultures? Describe various methods for the preservation of microbial cultures.
- (c) How can synchronous growth of a bacterial culture be obtained?
- (d) Which are the main ATP generating pathways in microorganisms?
- (e) How microbiology is applied to air pollution control (Bio-scrubbers and bio-filters)?
- (f) Define fermentation. Discuss the fermentation pathway of industrial importance.
