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.