#### NEN-012/NEV-012

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

Paper ID : 121662

Roll No.

#### B. TECH.

### Theory Examination (Semester-VI) 2015-16

## ECOLOGICAL AND BIOLOGICAL PRINCIPLES AND PROCESSES

Time: 3 Hours Max. Marks: 100

### Section-A

- 1. Attempt all parts. All parts carry equal marks. Write answer of each part in short.  $(2\times10=20)$ 
  - (a) What is net primary production and net ecosystem production?
  - (b) Provide short notes on ecological niche.
  - (c) How bacteria are classified?
  - (d) Explain biomethanation briefly.
  - (e) How to measure the biodegradability?

1 (1) P.T.O.

- (f) Define artificial ecosystem.
- (g) What is the meaning of co-evolution?
- (h) List the various abiotic components of an ecosystem.
- (i) Distinguish eukaryotes from prokaryotes.
- (j) Mention any 4 microbial enzymes important in the soil ecosystem.

# 2. Attempt any five questions from this section. $(10 \times 5 = 50)$

Section-B

- (a) Provide an equation to describe the ecological predator-prey model of competition with variables involved.
- (b) Explain the causes of ecological imbalances in the world and its effects on the biosphere.
- (c) Discuss in detail how ecological communities are organized and predictability of changes in it.

- (d) Describe the biochemical ecology of nitrification and denitrification with chemical reactions involved.
- (e) Elucidate the long range changes in an ecosystem with examples.
- (f) Illustrate the process of microbial cellular respiration and photosynthesis.
- (g) Discuss the role and importance of microorganisms in the waste assimilation.
- (h) (i) Write short notes on the different trophic levels.
  - (ii) How does the biomass and energy vary in the higher trophic levels?

Section-C

Note: Attempt any two questions from this section.

 $(15 \times 2 = 30)$ 

3. (a) Explain in detail about any two methods exploited for microbial characterization. (5)

1 (3) P.T.O.

- (b) What are the three stages of glycolysis and stepwise reactions involved in the glycolysis? (10)
- 4. (a) Represent the microbial growth curve of a simple batch culture. (5)
  - (b) Explain the various phases of microbial growth phases with relevant equations. (10)
- 5. (a) Give the principles of carbon oxidation.
  - (b) What are the factors required for shaping microbial community structure? Explain in brief the various type of interactions among species.

