

1-29

7/15

Exam.Code:0911  
Sub. Code: 6721

1128

**B.E. (Bio-Technology) Seventh Semester  
BIO-711: Environmental Biotechnology**

**Time allowed: 3 Hours**

**Max. Marks: 50**

**NOTE:** Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

I. Write briefly:

- a) What we do for volume reduction during sludge treatment?
- b) Write down the NRC equation for calculating efficiency of trickling bed filter.
- c) What is incineration?
- d) What is the difference of biofiltration and bioremediation?
- e) What are the limitations of BOD test?
- f) How sludge retention time is different from hydraulic retention time?
- g) What is recirculation ratio?
- h) What is nucleic acid hybridization?
- i) Which bacteria help in desulfurization of coal? ,
- j) What is acid rain?

(10x1)

**UNIT - I**

II. Differentiate between the following:-

- a) High and low rate trickling bed filter
- b) Aerobic and anaerobic treatment processes.

(5,5)

III. a) A natural stream has a BOD of 5 mg/l and the flow is 2000 litres per second, containing 6 mg/l of dissolved oxygen, what will be the volume of an industrial effluent containing 300 mg/l BOD, to be mixed so that the stream water BOD does not increase beyond 10 mg/l?

b) Draw oxygen sag analysis curve, write the basic Streeter - Phelps equation to describe and predict the behaviour of polluted stream. From this equation, determine critical travel time and critical deficit.

(5,5)

IV. a) Design a grit chamber for a population of 50000 people with water consumption of 135 LPCD. Consider sewage generation is 80% of the water supply. Consider the peak factor as 2.5, horizontal flow velocity as 0.2 meter/sec. Detention time is 1 minute. Consider width of the chamber as 1 meter. Provide 25% more to overcome turbulence, 0.3 meter free board and 0.25 meter for grit accumulation.

P.T.O.



(2)

- b) Compare between activated sludge process and trickling bed filter for waste water treatment. (5,5)

UNIT – II

- V. a) What are the factors influencing solid waste management  
b) Justify the importance of biominning as an economical alternative for treating specific mineral ores. (5,5)
- VI. a) Write short notes on the following:-  
i) Composting  
ii) Microbial petroleum extraction  
b) What are the safeties need to be followed for handling biohazardous wastes (5,5)
- VII. Write short notes on:-  
a) Biosensors  
b) DNA microarray in characterization of microbes (5,5)

x-x-x