Exam.Code:0911
Sub. Code: 6721

1129

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. I which is compulsory and selecting two questions from each Unit.*

x-x-x

I. Write briefly:

a) Differentiate BOD and COD.

b) What is biomining? Name few important organisms involved in biomining.

c) What is peak factor?

d) What is the difference between MLSS and MLVSS?

e) Why we need to know TDS of water?

f) Why recirculation factor is important for trickling bed filter?

g) Name few organism involved in MEOR.

h) Differentiate biofiltration and bioremediation. .

i) Name few organism involved in desulfurization of coal.

j) What is proportional weir? (10x1)

UNIT – I

II. a) Write short notes on:-

i) *In situ* and *Ex situ* bioremediation process

ii) Step aeration and tapered aeration for activated sludge process.

b) Design a secondary sedimentation tank of an activated sludge process system of 50 MLD (Peak Flow) capacities. MLSS=3000 mg/1 and peak factor= 2.25, surface loading= 20 $m^3/m^2/day$ at average flow. (5,5)

III. a) What is Stake's law? What are the design considerations for sedimentation tanks?

b) Briefly describe design criteria of screen and grit chamber for waste water treatment. (5,5)

IV. a) With a neat sketch explain the working principle and design criteria of UASB.

b) UASB treatment process treating industrial wastewater, determine the (i) size and dimensions of the reactor and (ii) detention time, given: Flow rate *(Q)* = 1200 m^3/day, COD (Influent) S_o = 2200 g/m^3 = 2.2 kg COD/ m^3. Average organic loading = 10 kg COD/m^3d, Reactor volume effectiveness factor = 90%, Wastewater upflow velocity = 1.5 m/h. (5,5)

P.T.O.

UNIT – II

V. a) What are the processes of solid waste treatment?

b) How can we recover expensive metals using biomining technique? Explain with example. (5,5)

VI. a) Why microbial desulfurization of coal is important in environmental aspects? Give example with reactions.

b) What are the safeties need to be followed for handling biohazardous wastes? (5,5)

VII. Write short notes on:-

a) Microbial enhanced oil recovery mechanism

b) Gel electrophoresis for characterization of microbes in environment (5,5)

x-x-x