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Total Number of Pages:02

B.Tech
HSSM3303

5th Semester Back Examination 2017-18
ENVIRONMENTAL ENGINEERING AND SAFETY

**BRANCH : AEIE, BIOMED, CHEM, CIVIL, ECE, EEE, EIE, ELECTRICAL, ETC, MANUFAC,
MANUTECH, MINERAL, MINING, PE, PLASTIC, TEXTILE**

Time: 3 Hours

Max Marks: 70

Q.CODE:B160

**Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.**

Q1 Answer the following questions:

(2 x 10)

- What are the abiotic components of an ecosystem? Give examples
- Define Food chain and Food web.
- Compute the p^H of a sample of $0.4 \times 10^{-3} M H_2SO_4$ solution.
- What is Energy Budget?
- What do you mean by environmental tolerance?
- What are the objects of Environment Protection Act, 1986?
- Differentiate between BOD and COD.
- Explain in brief Environmental auditing.
- List the components of municipal solid waste.
- What is meant by product safety?

Q2 a) What do you mean by energy flow through an ecosystem? Explain how energy transformation through an ecosystem can be explained with the two laws of thermodynamics. **(5)**

b) Explain the salient features hydrological cycle with flow chart. **(5)**

Q3 a) Give a flow sheet for pre-treatment processes required for municipal wastewater and discuss on it. **(5)**

b) Derive the expression for Hydraulic Retention Time (HRT) Considering the First Order reaction in Continuously Stirred Tank Reactor (CSTR). **(5)**

Q4 a) The sewage of a town is to be discharged into a river stream. The quantity of sewage produced per day is 8 million liters, and its BOD is 250mg/l. If the discharge in the river is 200l/s and its BOD is 6mg/l, Find the BOD of diluted water.

What should be the river discharge if it is desired to reduce the BOD of diluted water to 20mg/l?

b) Name important properties of hazardous waste. **(4)**

Q5 a) What is atmospheric dispersion? Sketch and explain Looping and Lofting plume dispersion phenomena. **(5)**

b) Briefly explain how EIA is considered as a project management tool. **(5)**

Q6 a) Write the concept of source, medium and receptor with respect to noise pollution. The average day time noise power level in an industrial area is 67 dB and night time noise power level is 55dB. Find out equivalent noise power level in the area. Assume day time and night time as from 6AM to 9PM and 9PM to 6AM respectively. **(5)**

b) What is noise standard? Discuss various elements of noise measurement **(5)**

Q7 a) Define system safety engineering. What do you understand by system safety techniques and what are the stages associated with system safety? **(5)**

b) What is environmental audit and what are its benefits? Write the programme planning for an effective environmental audit. **(5)**

Q8 Write notes on (any two); (5 x 2)

a) Environmental gradient and tolerance level of environmental factors.

b) Flue-gas desulphurization and NOx removal.

c) Chlorine demand and break point chlorination.

d) Hazard control measures in LPG bottling.