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

Paper ID : 100612 Roll No. | | | | | | | | | | |

B.TECH.

Theory Examination (Semester-VI) 2015-16

Environmental Engineering-II

Time : 3 Hours *Max. Marks : 100*

Section-A

Q.1 Attempt all parts. All parts carry equal marks. Write answer of each part in short. (2×10=20)

(a) Enumerate the amount of total solids present in waste water.

(b) Calculate one day 37°C BOD of sewage sample whose 5-days 20°C BOD is 100mg/l.

(c) Give the flow diagram for the activated sludge process.

(d) Write about the functions of sedimentation tank.

(e) Define 'flowing through period' and 'detection period' in a sedimentation basin.

(f) What is meant by 'disinfection' in treating public water supply?

(g) Describe a method of application of any one of the coagulants.

(h) Discuss how a slow sand filter differs from a rapid sand filter.

(i) How will you determine the optimum coagulant quantity by jar test?

(j) State the basic concepts of anaerobic contact process.

Section-B

Q2. Attempt any 5 questions from this section. (10×5=50)

(a) Explain the importance of determination of solids in sewage. How do you determine the suspended solids in a given sample of waste water?

(b) Write notes on:

(i) Cycles of decay of waste organic substances;

(ii) Concentration of solids in sewage;

(iii) C.O.D and B.O.D;

(iv) Composition of municipal sewage;

(v) BOD/COD ratio.

(c) Explain the term sludge volume index.

(d) Why coagulants are used in the sewage treatment? Mention few common coagulants.

(e) Classify the following under aerobic or anaerobic processes:

(i) Sludge digestion tanks;

(ii) Intermittent sand filters;

(iii) Trickling filters;

(iv) Activated sludge treatment;

(v) Lower compartment of imhoff tank.

(f) Discuss the use of chlorine as disinfecting agent with reference to:

(i) Its disinfecting action;

(ii) Its doses;

(iii) ltsforms; and

(iv) Testing its residuals.

(g) Describe briefly the various constituents of a coagulation-sedimentation plant.

(h) Explain in details about anaerobic fixed film reactor.

Section-C

Note: Attempt any 2 questions from this section. (15×2=30)

Q3. (a) A town has an average domestic sewage flow of 41,650 m^3/day with a BODconcentration of 250ppm. A neighboring industrial estate adds about 12,325 m^3/day of sewage having 9080kg of BOD to it. Find out:

(i) The concentrations of BOD in industrial and the combined sewage;

(ii) The probable population and per capita flow of sewage.

(b) Discuss briefly about the laboratory tests conducted on sewage and their importance in the treatment and disposal of sewage.

Q4. (a) Distinguish between low rate trickling filters and high rate filters.

(b) Calculate the volume and number of aeration tanks and the rate of air supply for the following data of the activated sludge unit;

Population	= 35,000
Average sewage flow	= 180lpcd
BOD of raw sewage	= 220mg/l
BOD removed in primary treatment	= 30%
Overall BOD reduction desired	= 85%

Q5. (a) The population of a city is 50,000 and the per day capita consumption is 130lit/day. Calculate the following in respect ot the rapid sand filter tor the above data.

(i) Total area of filters;

(ii) Number and dimension of each filter bed;

(iii) Quantity of air for air wash per filter bed;

(iv) Back wash water per filter bed after air wash.

(b) Design the septic tank for the following data:

No. of people	= 100
Sewage/capita/day	= 120lit
Desludging period	= 1 year
Length: width	= 4:1