B.Tech. SEM -VII (Civil) 2014 Course (CBCS) : WINTER - 2018

SUBJECT: ENVIRONMENTAL ENGINEERING - II

Day: Monday | **W-2018-2526** | Time: 02.30 PM TO 05.30 PM

Date: 26/11/2018 | Max Marks. 60

N.B. :

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Assume suitable data, if necessary.

Q.1 **a)** What is Grey water and black water? Explain with reference to its Sources and Quality. **(05)**

b) What are the advantages of separate and combined system of sewage? Explain in which conditions it can be adopted. **(05)**

OR

Q.1 **a)** What is the procedure for estimating quantities of storm water runoff and sanitary waste water in order to design the sewers? **(05)**

b) A 30 cm diameter sewer having an invert slope of 1:200 was flowing full. Determine velocity of flow and discharge? Is the velocity self cleansing? Given n = 0.012 **(05)**

Q.2 **a)** The 5 day BOD at 20^0C of waste water is 250 mg/L. Determine ultimate BOD and 5 day BOD at 27^0C. Given: rate constant at 20^0C = 0.12 and temperature coefficient = 1.047. **(05)**

b) What are the various types of velocity control devices provided in grit chamber? Explain parshall flume. **(05)**

OR

Q.2 **a)** What are chemical and biological characteristics of waste water? Explain pH and phosphates. **(05)**

b) What is the necessity of primary treatment of sewage? Explain about removal of pollutants in primary treatment. **(05)**

Q.3 **a)** What is activated sludge process? What are modifications in Activated sludge process? **(05)**

b) What are different methods of disposal of sewage? Explain **(05)**

OR

Q.3 **a)** What are problems in activated sludge process? Explain remedies for such problems. **(05)**

b) Design a high rate trickling filter for the following data: **(05)**
Sewage flow: 15000m^3/d, Recirculation ratio R = 1.5, BOD of raw sewage: 200mg/L, BOD removal in PST: 30%, Final effluent BOD desired: 30mg/L.

Q.4 **a)** Explain various stages of anaerobic digestion of sludge. **(05)**

b) Explain low rate and high rate digester with sketch. **(05)**

OR

Q.4 **a)** What are factors governing anaerobic digestion of sludge? Explain pH and temperature. **(05)**

b) What is the necessity of treatment of sludge? Enlist different methods. **(05)**

Q.5 **a)** What are the characteristics of dairy waste water? Explain its treatment process with sketch. **(05)**

b) What is difference between sewage treatment and industrial waste water treatment? **(05)**

OR

Q.5 **a)** What are the characteristics of sugar industry waste water? Explain its treatment process with sketch. **(05)**

b) Write a note on CETP. **(05)**

Q.6 **a)** What are public health issues in reusing and recycling waste water? **(05)**

b) Explain two pit latrine with sketch. **(05)**

OR

Q.6 **a)** What is the importance of rural sanitation? Explain in the context of Hygiene. **(05)**

b) What is the role of hydrological cycle in water recycling? **(05)**

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