

**B.TECH. SEM -VII (CIVIL) 2014 COURSE (CBCS) : SUMMER -
2018**

SUBJECT: ENVIRONMENTAL ENGINEERING-II

Day: **Tuesday**
Date: **22/05/2018**

S-2018-2471

Time: **02.30 PM TO 05.30 PM**
Max Marks: 60

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **Full** marks.
- 3) Use of non-programmable **CALCULATOR** is allowed.
- 4) Assume suitable data if necessary.

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- Q.1** a) What are the factors affecting storm water runoff? Explain. (05)
b) What is the necessary of appurtenances in sewerage system? Explain Drop manhole. (05)

OR

- Q.1** a) What is importance of self cleansing and non-souring velocities in sewer? Explain the factors affecting. (05)
b) Design a sanitary sewer of the following data: (05)
Population: 1 lakh. Rate of water supply: 135 lpcd. Manning's coefficient = 0.013. peak factor 3, Invert slope=1:400

- Q.2** a) The 5 day BOD at 20⁰ C of waste water is 200 mg/L. Determine ultimate BOD and 3 day BOD at 27⁰C. Given: rate constant at 20⁰C = 0.12 and temp. coefficient = 1.047 (05)
b) What is the necessity of velocity control in grit chamber? What are the various types of velocity control devices provided in grit chamber? (05)

OR

- Q.2** a) What are physical, chemical and biological characteristics of waste water? (05)
b) What is the necessity of PST in sewage treatment? Explain in its inlet and outlet arrangements. (05)

- Q.3** a) What are modifications in Activated sludge process? Explain. (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: 10000 m³/d, Recirculation ratio R= 1.5, BOD of raw sewage: 220 mg/L, BOD removal in PST:20%. Final effluent BOD desired = 30 mg/L.

- Q.4** a) Explain stages of anaerobic digestion of sludge. (05)
b) Compare – low rate and high rate digester (05)

OR

- Q.4** a) What are different methods of disposal of sludge? Explain. (05)
b) Write various design parameters of anaerobic digesters. (05)

- Q.5** a) What are various methods of sampling? Explain. (05)
b) Explain for pulp and paper industry waste water (05)
1. Sources of waste water
2. Treatment of waste water

OR

- Q.5** a) What are the characteristics of sugar industry waste water? Explain its treatment process. (05)
b) Write a note on CETP. (05)

- Q.6** a) Explain with sketch working of Septic tank. (05)
b) Explain necessity of waste water recycling in today's context of water scarcity. (05)

OR

- Q.6** a) Write a note on – Two Pit latrine (05)
b) What is the importance of rural sanitation in India? (05)