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BICE-018

B.TECH. CIVIL ENGINEERING

BTCLEVI

Term-End Examination

December, 2013

BICE-018 : ENVIRONMENTAL ENGINEERING-II

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt **any seven** questions. All questions carry **equal** marks. Use of scientific calculator is **permitted**.*

1. Define the term Physical, Chemical and Biological processes/operations. Explain the performance criteria for waste water management system. **10**

2. Define separate and combined water carriage systems. Explain the factors governing choice of separate system. **10**

3. Find the minimum velocity and gradient required to transport coarse sand through a sewer of 60 cm dia. with sand particles of 1mm dia., specific gravity of 2.66, $\beta = 0.06$, $f = 0.02$, and $N = 0.012$. Assume the sewer to run half full. **10**

4. For a waste water sample, 5 day BOD at 20°C is 200 mg/l which is 67% of the ultimate. What will be 4 day BOD at 30°C ? **10**

5. (a) Explain various processes involved in self purifications of river water. 5

(b) Discuss in brief various design parameters used for settling tanks. 5

6. Enumerate different aerobic processes for waste treatment. Discuss the attached growth processes and suspended growth processes. 10

7. The MLSS concentration in an aeration tank is 2000 mg/*l* and the sludge volume after 30 minutes of settling in a 1000 m*l* graduated cylinder is 176 m*l*. Calculate 10

(a) SVI
(b) SDI
(c) required return sludge ratio and
(d) SS concentration in the recirculated sludge.

8. Compare septic tank with Imhoff tank w.r.t scope, function and performance. 10

9. What do you understand by advanced waste water treatment ? How is it different from the conventional treatment ? Give important AWT processes in a tabular form. 10

10. Write short note on **any four** of the following : **4x2½=10**

(a) Factors considered for selecting materials of sewers.
(b) Ventilation of sewers
(c) Zones of pollution in the stream
(d) Units in primary treatment
(e) Use of trickling filter
(f) Stabilization pond