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BICEE-024

B.Tech. CIVIL ENGINEERING (BTCLEVI)

00935

Term-End Examination

June, 2014

BICEE-024 : ADVANCED ENVIRONMENTAL ENGINEERING

Time : 3 hours *Maximum Marks : 70*

Note : *Answer any **five** questions. All questions carry equal marks. Assume any suitable data, if missing. Scientific calculator is allowed.*

1. (a) Discuss the process of self-purification of natural water. *6*

(b) A stream, saturated with DO, has a flow of 1·2 m^3/s BOD of 4 mg/*l* and rate constant (base 10) of 0·3 per day. It receives an effluent discharge of 0·25 m^3/s having BOD 20 mg/*l*, DO 5 mg/*l* and rate constant (base 10) 0·13 per day. The average velocity of flow of the stream is 0·18 m/s. Calculate the DO deficit at a point 20 km downstream. Assume that the temperature is 20°C throughout and BOD is measured at 5 days. DO saturation at 20°C = 9·17 mg/*l*. *8*

2. Write short notes on the following : $4 \times 3\frac{1}{2} = 14$

(a) Dual media filter

(b) Mixed media filter

(c) Roughing filter

(d) Upflow filter

3. (a) Explain the method of application of chlorine to water, with the help of a suitable neat sketch. 8

(b) What do you understand by ozonation ? What are its advantages and disadvantages ? 6

4. (a) The sound power from a voice shouting is 0·001 W. What is the sound power level ? What are the sound intensity, the sound intensity level, the sound pressure and sound pressure level at a distance 6 m from the source ? $2+1\frac{1}{2}+1\frac{1}{2}+1\frac{1}{2}+1\frac{1}{2} = 8$

(b) Write the basic working principle of a sound level meter. Draw the neat sketch for a sound level meter. 6

5. Write short note on the following : $2 \times 7 = 14$

(a) Gravity settling chambers for control of particulate pollutants.

(b) Fixed-Bed-Adsorber for control of gaseous pollutants.

6. What are the meteorological parameters that influence air pollution dispersion ? Explain in detail. *14*

7. Write short notes on any ***four*** of the following $4 \times 3\frac{1}{2} = 14$

(a) Adsorption by activated carbon

(b) Oxidation ditch

(c) Biological treatment of waste water

(d) Tube settler in waste water treatment

(e) Flocculation in water treatment