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**BICEE-024**

# B.Tech. CIVIL ENGINEERING (BTCLEVI)

## Term-End Examination

## December, 2015

## 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. Use of scientific calculator is allowed.*

**1.** (a) Describe the types of treatment units in primary and secondary treatment of wastewater. *6*

(b) Describe in brief activated sludge process (ASP) design. What are the various limitations of ASP process ? Explain the various modifications of the process. *8*

**2.** (a) Noise characteristics are same as sound characteristics. Explain. *5*

(b) Draw the decibel scale to show various sound pressure levels. *4*

(c) Explain the role of lead and high transmission loss ceilings for control of noise. *5*

3. (a) Discuss the various zones of pollution developed in a river system after a polluted stream is added to the river. 5

(b) 10 million litres of sewage of a town is to be discharged into a river stream having flow of 250 *l*/s. The BOD of the sewage and river water is 220 mg/*l* and 5 mg/*l* respectively. Find the BOD of the river immediately after mixing. 5

(c) What should be the required percentage treatment of the sewage, if the river water BOD cannot exceed 15 mg/*l* ? 4

4. (a) Describe the various flue gas desulphurization processes. 7

(b) Discuss the various control systems available for gaseous pollution control. 7

5. (a) What are the various factors influencing the action of disinfectants ? 5

(b) Differentiate between dual media and multimedia filters. 4

(c) Write in brief the effect of pollution on rivers. 5

6. (a) Explain the various methods to remove taste and odour from water. *5*

(b) What is Break-point chlorination ? What is residual free chlorine ? *4*

(c) Explain the process of biofiltration. *5*

7. (a) Calculate the quantity of sludge produced per day in clarifier having moisture content of 95%. The clarifier removes 60% of incoming solids. Inflow to the clarifier is 200 $m^3$/hr with 300 ppm of suspended solids. Assume specific gravity of sludge as 1·02. *5*

(b) Explain the principle of working of tube settler. *5*

(c) Differentiate between hydraulic retention time and sludge retention time. *4*