BICEE-024

B.TECH. CIVIL ENGINEERING (BTCEVI)

Term-End Examination

June, 2013

BICEE-024 : ADVANCED ENVIRONMENTAL ENGINEERING

Time : 3 hours *Maximum Marks : 70*

Note : *(i)* *All question carry **equal** marks.*

(ii) *Answer **any seven** question.*

(iii) *Assume any suitable data if missing.*

1. Discuss the different zones of pollution in a river stream with a neat sketch.   10

2. Describe in brief the principle and usage application of dual media and multimedia filters of water treatment.   10

3. Explain the various instruments and techniques used for noise measurement. Mention noise level for different areas.   10

4. Describe the principle, working and operation of Trickling filter with neat sketches.   10

5. What is adsorption ? Discuss the principle **10** mechanism in adsorption of impurities by Activated Carbon. Mention the merits and demerits of activated carbon.

6. What is oxidation ditch ? Discuss its principle **10** and operation.

7. Discuss in brief the design consideration for **10** Extended Aeration. Explain the advantages of Extended Aeration over conventional secondary treatment.

8. Write short notes on : **2x5=10**
   (a) Source, effects and control of sulphur dioxides
   (b) Source, effects and control of Hydrocarbon

9. The sewage discharge of a town is $1.72 \, m^3/sec$. **10** The sewage is discharged into a river, whose minimum discharge is $7240 \, l/sec$. If the minimum dissolve oxygen to be maintained in the river is $4.4 \, mg/l$, determine the degree of sewage treatment to be done with the following data :
   (a) Temperature of sewage = temperature of river $= 20°C$
   (b) Value of K_1 $= 0.1, \, K_2 = 0.5$
   (c) BOD_5 @ $20°C$ $= 225 \, mg/L$ (sewage)

(d) BOD_5 @ 20°C $= 1.2$ mg/L (river)

(e) D.O. sewage $= 0$

(f) D.O. at saturation in river $= 80\%$

(g) Saturation D.O. @ 20°C $= 9.17$ mg/L

10. Calculate the affluent BOD of a two stage trickling filter with following data :   **10**

Flowrate $= 3.2$ m^3/min

BOD_5 $= 300$ mg/L

Volume of Filter I $= 900$ m^3

Volume of Filter II $= 900$ m^3

Filter depth $= 2$m

Recirculation ratio for both filter $= 1.5$.

Use NRC equation.

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