Total No. of Questions : 6] **SEAT No. :**

P4878 **[Total No. of Pages : 3**

B.E./Insem. - 1
B.E. (Civil)
ENVIRONMENTAL ENGINEERING - II
(2012 Pattern) (Semester - I)

Time : 1 Hour] ***[Max. Marks : 30***

Instructions to the candidates:

1) ***Solve Q. 1 or Q. 2, Q. 3 or Q. 4, Q. 5 or Q. 6***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Use of logarithmic tables, slide rule, Mollier charts, electronics pocket calculator and steam tables is allowed.***
5) ***Assume suitable data, if necessary.***

Q1) a) Differentiate between domestic sewage and storm water runoff. Explain giving reasons, when to adopt separate and combined systems of sewage. **[5]**

b) Explain the procedure of B.O.D.test when seeding of wastewater is required. **[5]**

OR

Q2) a) What do you understand by self purification property of stream? Explain the factors affecting this property. **[5]**

b) Explain the significance of maximum and minimum velocities to be maintained in sewer. **[5]**

Q3) a) How the following sewage treatment units helping to treat the waste water? **[5]**

i) Screens

ii) Grit chambers

iii) Primary Sedimentation Tank

P.T.O.

b) Design a grit chamber to treat domestic sewage of a town having discharge 1595 m^3/hr. Assume specific gravity of grit as 0.2 mm. Take the temperature of sewage = 10°C. Provide constant velocity of sewage in the chamber of 40 cm/sec. **[5]**

OR

Q4) a) Draw and explain process flow diagram for sewage treatment. **[5]**

b) Give discharge standard of BOD, COD, TSS,TDS Sulphates, Chlorides and Total Nitrogen on to land as irrigation water as per CPCB. **[5]**

Q5) a) Give the flow diagrams of single stage and two stage Trickling Filters.**[5]**

b) Determine the size of a high rate trickling filter for the following data:**[5]**

i) Sewage flow = 4.5MLD

ii) Recirculation ratio = 1.5

iii) BOD of raw sewage = 250mg/L

iv) BOD removal in primary tank = 30%

v) Final Effluent BOD desired = 30 mg/L

OR

Q6) a) An average operating data for conventional activated sludge treatment plant is as follows:

i) Wastewater flow = 35000 cum/day

ii) Volume of aeration tank = 10900 cum

iii) Influent BOD = 250 mg/L

iv) Effluent BOD = 20 mg/L

v) MLSS = 2500 mg/L

vi) Effluent SS = 30 mg/L

vii) Waste sludge SS = 9700 mg/L

viii) Quantity of waste sludge 200 cum/day

Based on information above determine

i) Aeration period (hrs)

ii) F/M ratio

iii) % efficiency of BOD removal

iv) Sludge age (days) **[5]**

b) Discuss the various modifications in basic Activated Sludge Process. **[5]**

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