

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 $1595 \text{ m}^3/\text{hr}$. 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 = 4.5 MLD
ii) Recirculation ratio = 1.5
iii) BOD of raw sewage = 250 mg/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]

