Total No. of Questions : 8]

SEAT No. :

P4560

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M.E. (Civil-Water Resource and Environmental Engineering)

ADVANCE WASTE WATER TREATMENT

(2012 Course) (Semester - II) (501610)

Time : 3 Hours] *[Max. Marks :100*

Instructions to the candidates:

1) ***Answer any three questions from each section.***
2) ***Figures to the right indicate full marks.***
3) ***Assume suitable data, if necessary clearly mentioning the same.***
4) ***Use of non-programmable scientific calculator is allowed.***

SECTION - I

Q1) a) Draw and explain different flow charts for wastewater treatment by physical, chemical and biological process. **[10]**

b) Explain basic principle of grit and sedimentation tank. **[6]**

Q2) a) Explain the various factors considered in the design of reactor. **[6]**

b) Explain mechanism of flocculation and explain different types of coagulants. **[10]**

Q3) a) Write note on equalization and neutralization. **[10]**

b) Design a primary settling tank of rectangular shape for a town having a population of 25000 with a WS of 135 lpcd. Assume 80% of water supplied is converted into a w/w. Assume: **[8]**

i) SOR = 30 $m^3/m^2/d$,

ii) L:B = 1:4

iii) DT = 2.5 Hrs.

P.T.O.

Q4) a) Write the kinetics of aerobic and anaerobic process. **[10]**

b) Explain working mechanism of grit chamber and write different types of grit chamber. **[6]**

SECTION - II

Q5) a) Write note fluidized bed reactor treatment. **[6]**

b) Average operating data for ASP plant is as follows **[10]**

i) Waste water flow = 25000 cum/d

ii) Volume of aeration tank = 15500 cum

iii) Influent BOD = 200mg/l

iv) Effluent BOD = 25 mg/l

v) MLSS = 3000 mg/l

vi) Effluent suspended slid = 40 mg/l

vii) Waste sludge suspended solids = 1200 mg/l

viii) Quality of waste sludge = 250 cum/d

Determine:

1) Aeration period

2) F/M ratio

3) Efficiency of BOD removal

4) Sludge age

Q6) a) Write note RBC. **[6]**

b) Design high rate single stage TF for population of 4000 persons. **[10]**

Q7) a) Explain with a neat sketch: working of a 2-stage digester. Explain empirical formulae used to find the volume of the 2-stage digester. **[10]**

b) Explain different methods of sludge disposal. **[6]**

Q8) a) Write note on **[10]**

i) Desalination

ii) Ultra filtration

b) Write different methods of dissolved solids and explain any one in detail. **[8]**

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