

Total No. of Questions : 8]

SEAT No. :

P4055

[5255]-553

[Total No. of Pages : 2

M.E. (Civil) (Water Resource & Environmental Engineering)
ADVANCED WATER & WASTE WATER TREATMENT
(2013 Course) (Semester - III) (601092)

Time : 3 Hours]

[Max. Marks : 50

Instructions:

- 1) *Answer any five questions.*
- 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, electronic pocket calculator and steam tables is allowed.*
- 5) *Assume suitable data, if necessary.*

Q1) Explain the principle & working of reverse osmosis & U.F. for water & waste water treatment. **[10]**

Q2) Discuss the principle, concept and necessity of aeration. Explain various methods of aeration with neat sketches. **[10]**

Q3) What is theory of filtration? Explain in detail components, under drainage system, cleaning & operational trouble in RSGF. **[10]**

Q4) Design an aerated grit chamber for the treatment of municipal wastewater. The average flow rate is $0.5 \text{ m}^3/\text{s}$. Take peak factor as 2.75. **[10]**

Q5) Explain unit operation & unit operation. State the microorganisms in waste water discuss their importance in waste water treatment system. **[10]**

P.T.O.

Q6) Design a high rate trickling filter using NRC equations for **[10]**

- a) sewage flow = 5MLD
- b) recirculation ratio = 1.5
- c) BOD of raw sewage = 300 mg/l
- d) BOB removal in PST = 35%,
- e) final effluent BOD desired = 30 MG/L.

Q7) Explain the methods of sludge treatment & disposal with their advantages & disadvantages. **[10]**

Q8) State the sources of waste water from manufacturing process, characteristics of effluent for dairy and automobile industry. Draw the treatment flow charts.**[10]**

x x x