

Total No. of Questions : 8]

SEAT No. :

P4607

[4760] - 1053

[Total No. of Pages : 2

M.E. (Civil) (Water Resource and Environmental Engg.)
ADVANCED WATER & WASTE WATER TREATMENT
(2013 Pattern)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 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) Design a tube settler module of square cross section with following data:**[10]**

- i) av. output from tube settler = $250\text{m}^3/\text{hr.}$,
- ii) loss of water in desludging = 2% of output required,
- iii) av. design flow = $(250 \times 100)/(100-2) 255.1\text{m}^3/\text{hr.}$,
- iv) cross section of square tube = $50\text{mm} \times 50\text{mm}$,
- v) length of tubes = 1m ,
- vi) angle of inclination of tubes = 60°

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 waste water. 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)** a) Explain theory & working of RBC. [5]
- b) With a neat sketch explain bacteria-algae symbiosis in oxidation pond. [5]
- 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 distillery & textile industry. Draw the treatment flow charts. [10]

