

Total No. of Questions : 12]

SEAT No. :

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[5154]-27

B.E. (Civil)

**INDUSTRIAL WASTE WATER MANAGEMENT
(2008 Pattern) (Semester-II) (Open Elective)**

Time : 3 Hours]

[Max. Marks :100

Instructions to the candidates:

- 1) Answer any three questions from each section.*
- 2) Answers to the two sections should be written in separate books.*
- 3) Neat diagrams must be drawn wherever necessary.*
- 4) Your answers will be valued as a whole.*
- 5) Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*
- 6) Assume Suitable data if necessary.*

SECTION-I

Q1) Explain the following processes for the removal of colloidal dissolved solids in waste water: **[18]**

- a) Ultra filtration.
- b) Reverse-osmosis.
- c) Electro-Dialysis.

OR

Q2) Attempt the followings.

- a) Discuss in detail about the physical unit processes commonly used in waste water treatment. **[10]**
- b) Explain the process for removal of color and Odour from waste water by activated carbon filtration. **[8]**

Q3) Attempt the followings.

- a) State & draw the single stage and two stage lime treatment process flow diagram for phosphorus removal. **[9]**
- b) Discuss in detail about the chemical oxidation with ozone for the reduction in COD & colour in waste water? **[7]**

OR

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Q4) Attempt the followings.

- a) Explain briefly how wetland could be used for waste water treatment system? [9]
- b) Explain chemical process for removal of heavy metals from waste water. [7]

Q5) Attempt the followings

- a) Explain briefly about the biological process for removal of phenol from industrial waste water? [9]
- b) Discuss the recycling of treated sewage after tertiary treatment? [7]

OR

Q6) Write in brief about: [4+4+4+4=16]

- a) Membrane reactor with submerged membrane
- b) Cyclic reactor.
- c) Nitrification process.
- d) De-nitrification process.

SECTION-II

Q7) Attempt the followings

- a) Draw & describe the schematic diagram of a waste treatment plant to reuse the sewage in residential complex. [9]
- b) Describe the methods of three R principles to convert waste in to wealth? [9]

OR

Q8) Attempt the followings

- a) Explain how waste water could be used for irrigation? Also discuss about preventive measures and health aspects? [9]
- b) Explain the mechanism of soda recovery in pulp and paper mills? [9]

Q9) Attempt the followings

- a) Explain the concept of zero Discharge of effluent? [8]
- b) Discuss the application of zero discharge technology based on three R Principles for pulp & paper industries. [8]

OR

Q10) Attempt the followings

- a) Draw & discuss the flow sheet for the zero discharge of waste water produced in Sugar cane industries? [8]
- b) Explain about the zero discharges of solid waste from residential complex? [8]

Q11) Attempt the followings

- a) Discuss the pollution hazards due to radioactive materials? [8]
- b) Explain the sorption mechanism & BDST model? [8]

OR

Q12) Attempt the followings

- a) Explain in brief the standards related to solid waste from residential complex. [6]
- b) Discuss about the green processes adopted in the industries? [10]

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