

Total No. of Questions : 10]

SEAT No. :

P3644

[Total No. of Pages : 3

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B.E. (CIVIL)

Environmental Engineering - II
(2012 Pattern) (Semester - I)

Time :2.5Hours]

[Max. Marks :70

Instructions to the candidates:

- 1) *Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10.*
- 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) Discuss the physical, chemical and biological characteristics of domestic sewage from urban area. [5]
- b) Discuss the different systems of sewerage commonly used in India with their relative merits and demerits. [5]

OR

- Q2)** a) Discuss the effect of change of life style on sewage quality. Also write the typical characteristics of domestic sewage. [5]
- b) Write a short note on Oxygen Sag Curve. [5]

- Q3)** a) Design the scree chamber of an STP to treat a peak flow of 100 MLD of sewage. Assume inclination of bars 45° with horizontal, Size of bars: 10mm x 70 mm, 10 mm dimension facing the flow, clear spacing between bars as 50mm and the velocity through the screen as 0.8 m/sec at peak flow. [5]
- b) Explain ASP with neat sketch. Write advantages and limitations of conventional ASP. [5]

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OR

- Q4)** a) Explain the biological principle of trickling filter with neat sketch. [5]
b) What is sludge bulking? Explain the control measures for the same. [5]

- Q5)** a) Design an oxidation pond for treating sewage from a residential colony having population of 10,000 with sewage flow rate of 120 lpcd with the following data. [8]

BOD₅ of raw sewage = 300 mg/l

Desired effluent BOD₅ = 30 mg/l

Location - 28° N

Elevation - 200 m above sea level

Temperature - 25°C

Sky clearance factor - 60%

BOD removal rate constant for the pond at 20° C as 0.1/d

Assume permissible organic loading at 28°N as 200 kg/ha.d.

- b) Discuss the phytoremediation technology for waste water treatment. Also discuss the advantages & limitations of this process. [8]

OR

- Q6)** a) Explain the Algal-Bacterial symbiosis in oxidation ponds. Discuss the design criteria of Oxidation Pond. [8]

- b) Explain the working principle and design criteria of Aerated lagoons. [8]

- Q7)** a) Discuss the working principle of package sewage treatment plant. Write the advantages and limitations of the same. [8]

- b) Discuss the various methods of sludge treatment. [8]

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OR

Q8) Draw a neat sketch of conventional sludge digester and explain the following: [16]

- a) Different stages of the digestion process.
- b) Micro-organisms responsible for the process.
- c) Design parameters of anaerobic digester.
- d) Capacity of the digester.

Q9) Explain the source of wastewater generation its characteristics and treatment options for its wastewater with the help of suitable flow diagrams for following industries. [18]

- a) Dairy Industry.
- b) Sugar Industry.

OR

Q10) Write a short note on following.

- a) Disposal of effluent from Sugar Mill.
- b) Importance of Equalization and Neutralization for Industrial wastewater.
- c) Secondary treatment options for industrial wastewater. [18]

