

Total No. of Questions : 10]

SEAT No. :

**P3520**

**[4959]-1001**

[Total No. of Pages : 2

**B.E. (CIVIL)**

**ENVIRONMENTAL ENGINEERING - II**

**(2012 Course) (Semester - I) (401001)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Attempt Q1 or Q.2, Q3 or Q4, Q5 or Q6, Q7 or Q8, and Q9 or Q10.*
- 2) *Figures to the right indicates full marks.*
- 3) *Draw neat figures wherever necessary.*
- 4) *Assume necessary data.*
- 5) *Use of scientific calculator is allowed.*

**Q1)** a) State the procedure for DO fixation and hence explain the necessity of DO fixation during determination of DO in water. **[5]**

b) Find min velocity and gradient required to carry coarse sand particles of size 1.5 mm and specific gravity 2.65 through a sewer of diameter 0.9m. Assume constants  $\beta = 0.04$ ,  $f = 0.03$  and  $N = 0.013$ . The sewer may be assumed to run half full. **[5]**

OR

**Q2)** a) Write Streeter-Phelps equation and explain the meaning each term involved in it. **[5]**

b) Write a short note on pumping of sewage. **[5]**

**Q3)** a) Design a bar screen for a peak flow of 25 MLD. **[5]**

b) What do you understand by trickling filter? Explain in detail with a neat sketch and biological processes involved in it. **[5]**

OR

**Q4)** a) Explain the purpose of providing grit chamber and give design criteria for grit chamber. **[5]**

b) Explain terms with respect to activated sludge process. **[5]**

i) HRT.

ii) SRT.

iii) MCRT.

iv) F/M Ratio.

*P.T.O.*

**Q5) a)** Explain with a neat sketch, the constructional features of a facultative stabilisation pond. [8]

Discuss the phytoremediation technology for waste water treatment.

b) Explain the principle of working of aerated lagoon. Also state the merits and demerits over aerated lagoon. [8]

OR

**Q6) a)** Differentiate between oxidation pond and aerated lagoon, with reference to HRT, organic loading method of aeration and operation cost. [8]

b) Explain root zone cleaning system for wastewater treatment. [8]

**Q7) a)** What do you understand by digestion of sludge? Differentiate between anaerobic and aerobic digestion. [8]

b) Write short note sludge drying bed. [8]

OR

**Q8) a)** What do you understand by sludge thickening? Enumerate various methods. Describe with the help of sketch gravity sludge thickener. [8]

b) Write short note on UASB process for waste water treatment. [8]

**Q9)** Give the range of important characteristics of waste water from following industry and draw a suitable flow diagram for treatment for each industry. [18]

a) Sugar industry.

b) Dairy industry.

c) Distillery industry.

OR

**Q10)a)** Write short note on. [9]

i) Equalization.

ii) Neutralization.

b) Discuss in brief various treatment processes adopted for treating industrial waste water. [9]

