

Total No. of Questions : 10]

SEAT No. :

P2110

[Total No. of Pages : 3

[5254]-501

B. E. (Civil)

ENVIRONMENTAL ENGINEERING - II
(2012 Pattern) (Semester - End)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Attempt Q.1 or Q.2 Q.3 or Q.4 Q.5 or Q.6 Q.7 or Q.8, and Q.9 or Q.10.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw neat figures wherever necessary.*
- 4) *Assume Suitable data if necessary.*
- 5) *Use of scientific calculators is allowed.*

- Q1)** a) Explain effect of change of life style on sewage quality. [4]
b) Write Streeter - Phelps equation and explain the terminology used in equation. [6]

OR

- Q2)** a) Write the procedure to determine biochemical oxygen demand and its significance in wastewater treatment. [3+2]
b) Enlist different methods of collection and conveyance of sewage. [5]

- Q3)** a) Draw a process flow diagram of sewage treatment and write the impurities removed from each unit. [5]
b) Draw a schematic sketch of rotating biological contractor and write the design parameters considered. [5]

OR

- Q4)** a) Write the difference between primary treatment and secondary treatment.[4]
b) A single stage filter is designed for an organic loading of 10000 kg of BOD in raw sewage per hectare meter per day with a recirculation ratio of 1.2. This filter treats a flow of 4 MLD of raw sewage with a BOD of 200 mg/l. Use NRC formula to determine the strength of the effluent. BOD removal in primary sedimentation tank is 35%. [6]

P.T.O.

- Q5) a)** Explain aerated lagoon with respect to its working principle, design parameters and applications. [4 + 2 + 2]
- b) Write wastewater treatment principle of phytoremediation technology and explain its working with schematic sketch. [4 + 4]

OR

- Q6) a)** Write working principle, draw a schematic sketch and application of root zone cleaning system for wastewater treatment. [3 + 3 + 2]
- b) Design an oxidation pond for the following data [8]
- i) Sewage flow = 20 m³/d
 - ii) BOD of raw sewage = 200 mg/l
 - iii) Mean monthly temperature = 30°C Maximum and 10 °C minimum
 - iv) Desired effluent BOD = 20 mg/l
 - v) Location = 20° latitude
 - vi) Yield of photosynthetic = 250 kg/ha/d
 - vii) Depth of pond = 1.5 m

- Q7) a)** Write advantages, disadvantages and application of up flow sludge blanket reactor. [3 + 3 + 2]
- b) Write principle of anaerobic digestion and enlist factors affecting anaerobic digestion and explain any one factor in detail. [2 + 3 + 3]

OR

- Q8) a)** Enlist different methods of sludge treatment and disposal and explain any one method of sludge treatment. [2 + 2 + 4]
- b) Explain working principle of package sewage treatment plant, write its advantages and disadvantages. [2 + 3 + 3]
- Q9) a)** Explain equalization tank with respect to parameters considered in design, advantages and disadvantages. [3 + 3 + 3]

- b) Explain the following points related to distillery industry. [3 + 3 + 3]
- i) Flow sheet of manufacturing process and wastewater generation
 - ii) Characteristics of wastewater.
 - iii) Flow sheet of wastewater treatment

OR

- Q10)**a) Explain the following points related to dairy industry. [4 + 3 + 3]
- i) Flow sheet of manufacturing process and wastewater generation
 - ii) Characteristics of waste water.
 - iii) Flow sheet of wastewater treatment
- b) Explain in brief primary and secondary treatment process adopted for treating industrial wastewater. [4 + 4]

