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 m^3/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]**