Total No. of Questions :6]

SEAT No. :

P186

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Oct./BE/ Insem. - 501

B.E. (Civil)

ENVIRONMENTAL ENGINEERING-II

(2015 Course) (Semester-I) (401001)

Time : 1 Hour] *[Max. Marks :30*

Instructions to the candidates:

1) ***Attempt Q1 or Q2, Q3 or Q4, Q5 or Q6, Figures to the right indicates full marks.***
2) ***Draw neat figures wherever necessary.***
3) ***Assume any missing data if necessary.***
4) ***Use of scientific calculators is allowed.***

Q1) a) What do you understand by self-purification property of stream? Explain the factors affecting self-purification of stream. **[2+3]**

b) Design a sanitary sewer for the following data: **[5]**

i) Population = 130000 persons ii) Rate of water supply = 1901pcd

iii) Value of n = 0.012 iv) Peak factor = 2.5

v) Slope = 1 in 700

OR

Q2) a) Determine the storm water discharge produced from district of 45 hectors comprising different type of sub catchment as given below. The average intensity of rainfall in the area is 45 mm/hr. **[2+3]**

Sr.No.	Type of catchment	% of area	Coefficient
1	Built up area	25	0.95
2	Road Surface	15	0.8
3	Open space	20	0.2
4	Lawns and gardens	40	0.15

b) Write objectives and action plan of national river cleaning plan. **[5]**

P.T.O.

Q3) a) Draw a flowchart for sewage treatment plant consisting primary and secondary treatment. Enlist the pollutants removed from each unit operation and process. **[2+3]**

b) Design a grit chamber for the following date: **[5]**

i) Flow=1500m^3 per hour

ii) Settling velocity of particle 0.01 m/s

iii) Flow through veloctiy 0.3 m/s

OR

Q4) a) Design primary settling tank of rectangular shape for a town having a population of 1,30,000 with sewage generation rate of 150 lpcd. Surface overflow rate 50 m^3/d. m^2. Assume suitable date if required. **[5]**

b) Explain with neat sketch, the principle and working of grit chamber **[2+1+2]**

Q5) a) Define sludge bulking. Write any four causes and remedial measures for sludge bulking **[1+2+2]**

b) An average operating date for conventional activated sludge treatment is as follows **[5]**

a	Wastewater flow	20500m^3/d
b	Volume of aeration tank	3500m^3
c	Influent BOD	200mg/l
d	BOD removal from primary sedimentation tank	30%
e	Effluent BOD	10 mg/l
f	Mixed liquor suspended solids (MLSS)	2500 mg/l

Based on the information above, determine

i) Aeration period (hour)

ii) Food to microorganism ratio

iii) Percentage efficiency of biochemical oxygen demand removal.

OR

Q6) a) A single stage trickling 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 1.1 This tricking filter treats 1.95 MLD of raw sewage with a BOD of 180 mg/l. Use NRC formula and determine the strength of the effluent. **[5]**

b) Write biological principle, advantages and disadvantages of sequential batch reactor **[1+2+2]**

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