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VI SEMESTER B.TECH. (CIVIL ENGINEERING)
END SEMESTER EXAMINATIONS, APRIL/MAY 2017
SUBJECT: **WASTEWATER MANAGEMENT [CIE 3202]**

REVISED CREDIT SYSTEM

(17/06/2017)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitable assumed.

1A.	Differentiate between the following a. Aerobic and anaerobic process. b. Suspended growth process and attached growth process	**4**
1B.	How the change in temperature affect the wastewater and its treatment?	**2**
1C.	For a wastewater sample, 5-day BOD at 20°C is 300 mg/l and is 70% of the ultimate BOD. What will the 4- day BOD at 30° and 1-day BOD at 20°C? Assume $\theta = 1.047$.	**4**
2A.	Design a grit chamber having rectangular cross section for the following data o Maximum flow = 30 MLD o Average temperature = 20°C o Diameter of the smallest grit particles = 0.2 mm o Specific gravity of the grit particles = 2.65	**4**
2B.	Write a note on uses of chemical clarification in wastewater treatment	**3**
2C.	What are screenings? How the screenings are disposed?	**3**
3A.	"Recirculation of sewage is an important feature of high rate trickling filter". Justify	**2**
3B.	List and explain anyone type of modification of activated sludge process along with a neat diagram	**3**
3C.	Design a completely mixed activated sludge process to treat domestic sewage of city having population of 50000 with an average rate of water supply of 190LPCD. Influent and effluent BOD concentration are of 350mg/L and 25mg/L respectively. BOD removal in primary clarifier is 30%.K_d=0.07/d, Y=0.6, MLSS=4000mg/L, θ_c=5days. Assume MLYSS=0.8*MLSS.	**5**
4A.	What is stabilization pond? Write briefly about its types.	**5**
4B.	With a neat diagram explain the working of rotating biological contactor.	**3**
4C.	Define: i) sloughing ii) SYI	**2**

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5A.	What do you understand by digestion of sewage sludge? With a neat diagram explain the anaerobic sludge digestion process.	**4**
5B.	Sketch the DO sag curve resulting from a wastewater containing an organic waste along with the representation of various phases in detail. What causes the DO to decrease?	**3**
5C.	A river with a flow rate of 1000 m^3/sec has a BOD of 10 mgL^{-1} and receives multiple discharges of wastewater from both sides. One wastewater discharge has a flow rate of 10 m^3/sec and a BOD of 300 mgL^{-1} (it is untreated sewage) while the other discharge from the opposite bank is 50 m^3/sec and 200 mgL^{-I} of BOD (wastewater after primary settling). The DO levels in the river upstream of the wastewater discharges is 7 mg/L and wastewaters have zero DO. Calculate the BOD and DO @ the point where two waste water streams meet the river	**3**