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V SEMESTER B.TECH. (CIVIL ENGINEERING)

END SEMESTER EXAMINATIONS, NOV/DEC 2016

SUBJECT: WATER SUPPLY ENGINEERING [CIE 3103]

REVISED CREDIT SYSTEM
(29/11/2015)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

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

1A.	In a town, it has been decided to provide 200 liters per head per day in 21st century. Estimate the domestic water requirements of this town in the year AD 2000 by projecting population of town by incremental increase method. Year: 1940, 1950, 1960, 1970, 1980 Population: 2,37,98,624; 4,69,78,325; 5,47,86,437; 6,34,67,823; 6,90,77,421	**6**
1B.	Water has to be supplied to a town with 1 lakh population at the rate of 150 liters per capita per day from a river 2000m away. The difference in elevation between lowest water level in sump and reservoir is 36m. If the demand has to be supplied in 8 hours, determine the size of main pipe and break horse power of pumps required. Assume maximum demand as 1.5 times the average demand. Assume friction factor f = 0.0075, velocity of pipe is 2.4m/see and efficiency of pump as 80%.	**4**
2A.	Enumerate and discuss in brief various physical, chemical and biological characteristics of testing of raw water supplies.	**6**
2B.	The maximum daily demand of a treatment plant is 10MLD. Design a suitable sedimentation tank for raw water supply, assuming detention period of 5 hours and velocity of flow as 20cm per minute. Sketch inlet, outlet and sludge removal arrangements.	**4**
3A.	Explain with a neat sketch how optimum alum dosage is determined in the laboratory	**4**
3B.	8mg of copperas is consumed with lime at a coagulation basin (per litre of water). Determine the quantity of copperas and quick lime required to treat 10 million liters of water. (Molecular Weight: Fe -55.85, S-32, 0-16, H-1, C-12, Ca-40)	**3**
3C.	Explain the objectives and mechanism of aeration.	**3**
4A.	Chlorine usage in a treatment plant of capacity 25000 m3/day is 12 kg/day. The residual after 10 minutes of contact is 0.2mg/1. Calculate the dosage in milligrams / liter and chlorine demand of water.	**2**

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4B.	Discuss any two operational troubles in rapid gravity filters. Also explain the purpose of wash water trough and under drainage system in rapid sand filters.	**4**
4C.	Explain the various methods which are adopted to remove color, odor and taste from water.	**4**
5A.	Explain with a neat sketch grid-iron layout of distribution system.	**3**
5B.	Explain the various detection methods to identify leakages in distribution system.	**3**
5C.	Briefly explain different types of reservoirs.	**4**