GUJARAT TECHNOLOGICAL UNIVERSITY PDDC - SEMESTER-IV • EXAMINATION – WINTER 2013

Subject Code: X40601

Subject Name: Environmental Engineering

Ingineering

Time: 02.30 pm - 05.00 pm

Total Marks: 70

Date: 03-12-2013

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- Instructions:
 - 1. Attempt all questions.
 - 2. Make suitable assumptions wherever necessary.
 - 3. Figures to the right indicate full marks.
- Q.1 (a) Describe various factors affecting per capita demand of water.
 - (b) Why coagulants are added to raw water ? state the reasons for using alum salt as 07 coagulant.
- Q.2 (a) The following is the population data of a city available from past census 07 records. Determine the population of the city in 2031 by (1) arithmetic increase method (2) geometrical increase method.

Year	1951	1961	1971	1981	1991	2001	2011
Population	117000	173000	28500	417000	571000	679500	743000

⁽b) Explain non-silting, non-scouring velocity with reference to design of sewers. 07

OR

- (b) Write Short note on "Rapid Sand Filter".
- Q.3 (a) Explain different factors affecting the site selection for an intake structure 07 (b) How storm water discharge and domestic waste discharge are estimated for 07
 - (b) How storm water discharge and domestic waste discharge are estimated for 07 design of sewers?

OR

- Q.3(a) What are the objectives of water treatment?07(b) Give the classification of different types of pumps used in water supply.07
- Q.4 (a) Find the settling velocity of spherical silica particle of sp.Gr. 2.65 in water of 25'C if the diameter of particle is 0.03mm. take kinematic viscosity of water at 25'C = 0.009 sqcm / sec.
 - (b) Explain with neat sketch working and cleaning of rapid sand filter.

OR

- Q.4 (a) What is grit chamber? Why it is necessary to provide this in the treatment of 07 sewage? Discuss the design criteria of same.
 - (b) How will you select treatment scheme for a municipal wastewater treatment 07 plant? Draw layout plan of a typical municipal wastewater treatment plant and explain in detail its units.
- Q.5 (a) Design a circular sewer running half-full at a peak flow of 0.8m3/sec. Take 07 Manning's constant N=0.012 and assume it to be constant with respect to depth of flow. The maximum permissible velocity at the time of peak flow is 0.8m/sec.

(b) A city with 2.5 lakh population is to be supplied water at 130 lpcd from a river 1.5 km away. The difference in water level of sum[and reservoir is 30m. If the demand has to be supplied in 8 hours, determine the size of the raw water main and B.H.P of the pumps to be installed. Assume maximum demand as 1.5 times the average demand. Take f=0.0075, velocity in the pipe as 2.0m/s and efficiency of pump as 80%.

OR

Q.5 (a) Write short note on" Septic tank"(b) Explain with neat sketch Reservoir Intake structure.

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