

USN

--	--	--	--	--	--	--	--	--	--

10CV61

Sixth Semester B.E. Degree Examination, Dec.2017/Jan.2018

Environmental Engineering – I

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1 a. Explain in detail the various types of water demands. (06 Marks)
 b. With the help of a diagram, describe the hourly variation of water demand. (06 Marks)
 c. The following data have been collected from the census department for a city. Calculate the probable population of the city in the year 2020 by using geometrical increase method:

Year	Population
1960	35,00,000
1970	46,60,000
1980	99,50,000
1990	1,56,00,000
2000	1,63,00,000
2010	1,84,00,000

(08 Marks)

- 2 a. What are intake structures? Describe with neat sketch a intake structure. (08 Marks)
 b. Describe the working of a simple hand operated reciprocated pump. (06 Marks)
 c. Estimate the size of supply conduct for a city with population of 5,00,000. Assume water consumption as 270 l/c/d and flow velocity through the pipe as 1.2 m/sec. (06 Marks)
- 3 a. What is meant by turbidity of water? Explain how to determine the optimum coagulant dosage in the laboratory using Jar Test apparatus. (10 Marks)
 b. Explain the significance of the following parameters of water, with their standards:
 i) Hardness of water
 ii) Chlorides
 iii) Fluoride
 iv) Turbidity
 v) Nitrates (10 Marks)

- 4 a. Draw the water treatment flow chart indicating the impurities removed at each unit and discuss briefly of them. (10 Marks)
 b. Design a sedimentation tank for a water works which supplies 1.5×10^6 liters/day. Velocity of flow is 15 cm/min and depth of water in tank is 3.5 m. Sedimentation period is 5 hours. Assume an allowance for sludge as 50 cm. (10 Marks)

PART – B

- 5 a. Explain the theory of filtration process for the treatment of water. (10 Marks)
 b. Design a set of 8 rapid gravity filters for treating water at water works, which has to supply water to a town of population 3,00,000. Per capital demand if the town is 270 liters/day. The rate of filtration of the rapid gravity filter may be taken as 4500 litres/hour/sq.m. (10 Marks)

- 6 a. Explain lime soda process for removal of hardness. (08 Marks)
- b. Discuss briefly on:
- i) Pre and Post chlorination
 - ii) Super chlorination
 - iii) Dechlorination (06 Marks)
- c. Write the requirements of a good disinfectants. (06 Marks)
- 7 a. Explain methods for removing fluoride from water. (10 Marks)
- b. List the different layout of distribution system of water. Explain any two methods. (10 Marks)
- 8 a. Differentiate between port fire hydrant and flush fire hydrant. (10 Marks)
- b. Write short notes on:
- i) Back wash of RSF
 - ii) Break point chlorination (10 Marks)

* * * * *