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)**

* * * * *