Registration No :

Total Number of Pages : 02

M.Tech
P1ESBC03

1ˢᵗ Semester Regular / Back Examination 2018-19
WATER SUPPLY ENGINEERING
BRANCH : ENVIORN ENGG., ENVIRONMENTAL SCIENCE AND ENGG
Time : 3 Hours
Max Marks : 100
Q.CODE : E836
Answer Question No.1 (Part-1) which is compulsory, any EIGHT from Part-II and any TWO from Part-III.
The figures in the right hand margin indicate marks.

Part- I

Q1 **Short Answer Type Questions (Answer All-10)** (2 x 10)
- **a)** Define per capita water demand. How is it calculated?
- **b)** Name the layouts of water distribution system.
- **c)** Write down the chemical reaction when alum is used as a coagulant.
- **d)** What are carbonate and noncarbonate hardness?
- **e)** What is a perched aquifer? Show with a neat sketch.
- **f)** Define detention time and flow through time for a sedimentation tank? Define displacement efficiency.
- **g)** What do you mean by chlorine demand of water?
- **h)** Which factor governs the design of a rapid gravity filter?
- **i)** What is deflouridation? Explain.
- **j)** What are the basic functions of an intake well?

Part- II

Q2 **Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)** (6 x 8)
- **a)** Enumerate the factors affecting per capita water demand.
- **b)** Briefly discuss about break point chlorination with a neat sketch.
- **c)** Define shallow and deep open well. What is cavity formation in well? How does it affect the yield of an open well?
- **d)** Write short note on intake towers with neat sketches.
- **e)** Explain the purpose of aeration in water treatment. What are its limitations?
- **f)** Discuss about the mechanisms of filtration.
- **g)** Discuss about water hammer pressure. How it is created in a Pipe. How can you prevent it?
- **h)** Explain the Hardy Cross method of solving the pipe network.Derive the expression you use for correction of the assumed flow.
- **i)** Define an aquifer. Briefly discuss about the various types of aquifer with neat sketch.
- **j)** The following is the population data of a city available from past census records. Determine the population of the city in 2021 by (a) arithmetical increase method (b) geometrical increase method.

year	1941	1951	1961	1971	1981	1991	2001
Population(lakhs)	1.21	1.65	2.68	4.15	5.75	6.81	7.41

- **k)** Briefly discuss how can you determine the BOD of a wastewater sample in the laboratory.
- **l)** In two periods of15 years, a city has grown from 35,000 to1,80,000 and then to 3,50,000. Determine :
  - i) the saturation population;
  - ii) the equation of logistic curve;
  - iii) the expected population after the next 15 years.

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