

Seat No.	
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T.E. (Civil) (Part - I) (Revised) Examination, December - 2015

**ENVIRONMENTAL ENGINEERING - I**

**Sub. Code : 45540**

Day and Date : Saturday, 12 - 12 - 2015

Total Marks : 100

Time : 02.30 p.m. to 05.30 p.m.

- Instructions :
- 1) Que. No. 1 & Que. No. 5 are compulsory.
  - 2) Solve any two questions from remaining in each section.

**SECTION - I**

**Q1) Answer ANY THREE of following : [3 × 6 = 18]**

- a) What is Energy efficient building?
- b) What are water quality parameters? Explain any one.
- c) Draw detailed cross section of intake well.
- d) What is electro dialysis process?
- e) Explain the concept of plate settler.

**Q2) a) Explain the chemistry of chlorination in detail. [6]**

- b) Design rapid mixing tank and flocculator for the flow of 6.5 MLD. Apply usual checks. [10]

**Q3) a) Predict the population for the year 2021, 2031, and 2041 from the following population data with incremental increase method. [8]**

Year	1961	1971	1981	1991	2001	2011
Population	8,58,545	10,15,672	12,01,553	16,91,538	20,77,820	25,85,862

P.T.O.

- b) Explain requirements of rural water supply scheme. Also mention Sequence of treatment for : [8]
- i) Ground water containing excessive iron, dissolved  $\text{CO}_2$  and odorous gases.
- ii) For highly polluted surface water with algae or other micro organisms.

- Q4)** a) Explain the concept of green building with respect to indoor air quality. [8]
- b) Mention various processes of demineralization. Explain any one in detail. [8]

### SECTION - II

**Q5)** Answer any three of the following.

- a) Give the advantages and disadvantages of CI Pipes. [6]
- b) Explain in short the methods of distributing water. [6]
- c) Explain the Newton Rapson method of hydraulic network analysis. [6]
- d) Draw a neat sketch of the post type fire hydrant and mention purpose and ideal location. [6]
- e) How the maintenance of water distribution system is carried out? [6]

- Q6)** a) What are the forces acting on pressure pipes? Explain in brief. [8]
- b) Find the equivalent diameter of pipe having length 1000 m for a network given below. [8]

Pipe	Length(m)	Diameter (mm)
PQR	800	300
PSR	1200	400

- Q7) a) Explain with neat sketch the components of service connection. [6]  
 b) Analyze the following network by Hardy-cross method. Inflow at A is 200 lit/s & Outflows at B, C and D are 70, 50 and 80 liter/s respectively. [10]

Pipe	Length(m)	Diameter (mm)
AB	300	200
BC	250	150
CD	350	250
DA	200	200

Assume H-W coefficient 100 for all pipes (Take one trial only).

- Q8) a) Draw a neat sketch of air relief valve and write the purpose and location. [8]  
 b) Using analytical method determine the balancing storage of service reservoir from following data. [8]

Population 10 lakh, average water demand 160 lpcd, water is supplied to the reservoir by constant rate pumping.

Time	lpcd
6 am to 10 am	70
10 am to 2 pm	30
2 pm to 6 pm	20
6 pm to 10 pm	35
10 pm to 6 am	05

- Q3) a) Predict the population for the year 2021, 2031, and 2041 from the following population data. \*\*\* The increase method. [8]

Year	1961	1971	1981	1991	2001	2011
Population	8,58,545	10,15,672	11,01,553	12,01,538	13,77,820	15,85,862