

B.E. (Part-Time) DEGREE EXAMINATIONS, NOV/DEC 2013  
Civil Engineering - Fourth Semester  
Regulation R-2009

**PTCE 9304- WATER SUPPLY ENGINEERING**

Time: 3 Hrs

Maximum: 100 marks

Answer ALL questions

**PART A (10 X 2 = 20 marks)**

1. List the factors that affect rate of water demand.
2. List the deciding factors of design period for water supply projects.
3. What are the differences between transmission mains and distribution pipes?
4. Differentiate 'Gravity Conduits' and 'Pressure Conduits'.
5. What are various 'Unit Operations and Processes' in conventional water treatment plant?
6. Define 'Break Point Chlorination' and 'Residual Chlorine'.
7. Define 'adsorbent' and 'adsorbate'.
8. List any four factors to be considered in selecting pipe materials for water supply.
9. What are the requirements of good distribution systems?
10. What is the loss of head in a CI transmission main of 300 mm in diameter and 2 km length with C value = 100, when it carries a flow of 10 m<sup>3</sup>/min.

**PART B (5 X 16 = 80 marks)**

11. The following data shows the variations in population of a town from 1962 to 2012. Estimate the population of the town in the year 2042 using incremental increase method and logistic curve method. If the average daily water demand is 100 lpcd, estimate the future demand.

Year	1962	1972	1982	1992	2002	2012
Population	16500	26800	41500	57500	68000	74100

- 12(a)(i) Water is required to be pumped from a reservoir for a colony having population of 8000. Design a pumping main and find the HP of the pump required with the following data.  
Rate of water supply = 140 lpcd, Seasonal variation factor = 1.6, Pumping Hours = 16, Bottom R.L of sump = 200.50m, R.L of ground = 205.50m, Full supply level of tank = 265.00m, Length of rising main = 400m, Velocity of flow in pipe = 1.5m/sec, Hazen William's Coefficient = 110, Overall efficiency of pump = 70%. **(10)**

(ii) Draw the Dry Intake and Wet Intake Structures **(6)**

**(OR)**

- (b) Explain the procedure for laying, jointing and testing of water supply pipes.

- 13(a) A city has design population of 80,000. If the average rate of demand is 160 liters per head per day, design completely a rapid sand filter including washwater troughs and the drainage system. Assume suitable data required.

**(OR)**

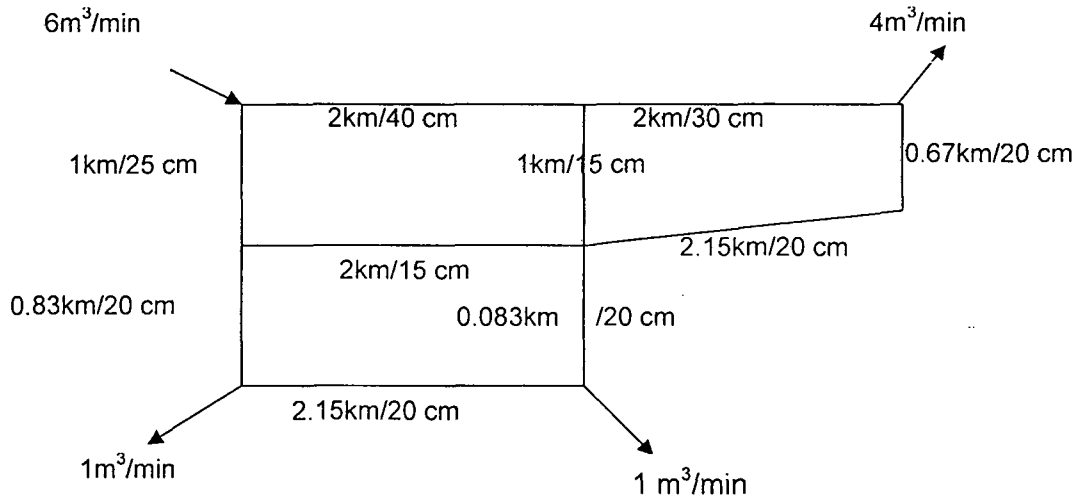
- (b) Design and draw a clariflocculator for treatment of 10 MLD water in a water treatment plant.

- 14(a) Compare Lime-Soda Process and Zeolite Process for water softening.

**(OR)**

- (b) Write short notes on
- (i) Distillation
  - (ii) Reverse osmosis
  - (iii) Electrodialysis
  - (iv) Demineralization.

15 (a) Balance the following distribution network and obtain the flows in each of the pipes (stop with two iterations). The length of the pipes is given in km and diameter of pipe is given as cm.



(OR)

- (b) From the following record of average monthly stream flows determine the required reservoir size to provide a uniform draft of 10,000 m<sup>3</sup> / day. (Use analytical method).

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb
monthly flow 10 <sup>6</sup> m <sup>3</sup>	0.18	1.02	1.32	0.51	0.87	0.67	0.19	0.08	0.07	0.04	0.10	0.26	0.20	1.10