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53 (CE 717) DWST

2015

**DESIGN OF WATER SUPPLY AND  
TREATMENT SYSTEM**

Paper : CE 717

Full Marks : 100

Time : Three hours

**The figures in the margin indicate  
full marks for the questions.**

Answer **any five** questions.

1. (a) Explain, with the help of neat layout of a conventional waste water treatment plant. 12
- (b) Describe in brief various test conducted for physical examination of water. 8

Contd.

2. (a) A rectangular sedimentation basin is to handle 12 million litres/day of raw water. A sedimentation basin of width to length ratio of  $1/3$  is proposed to trap all particles larger than  $0.05\text{mm}$  in size. Assume specific gravity =  $2.62$  for particles and  $20^\circ\text{C}$  as the average temperature determine the basin dimension, if the effective depth of tank is  $3\text{m}$ . Calculate the detention time.

12

(b) Sketch and describe briefly construction and working of a septic tank. 8

3. (a) A town has a population of 100,000 persons with a per capita water supply of 200 litres/day. Design a sewer running  $0.7$  times full at maximum discharge, take a constant value of  $N = 0.013$  at all depth of flow. Slope =  $1\text{ in } 500$ , take peaking factor of 3 and assuming 80% of water supplied to the town appears as sewage. 12

(b) A city has a population of 100,000 with an average rate of demand of 160 litres per head per day find the area of Rapid sand filters. 8

4. (a) Explain with the help of neat sketch the construction and working of a conventional trickling filter. 10
- (b) What is a zeolite? How is it regenerated? Explain the zeolite method of water softening. 10
5. (a) Explain with the help of diagrams, various systems of plumbing used for house drainage. 8
- (b) Design an imhoff tank to treat the sewage from a town with 40,000 population. The rate of sewage may be assumed as 200 litres per head per day. Assume suitable data. 12
6. (a) Discuss in brief various method of water distribution. Which method do you prefer? 6
- (b) Discuss the hydrograph method for determining the storage capacity of reservoir. 6
- (c) Explain the mechanism of purification in facultative ponds. 8
7. (a) Explain with the help of a flow diagram, the essentials of activated sludge process. 6