

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2132

Roll No.

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B.Tech.

(SEM. V) ODD SEMESTER THEORY

EXAMINATION 2013-14

ENVIRONMENTAL ENGINEERING – I

Time : 2 Hours

Total Marks : 50

Note :—Attempt all questions.

1. Attempt any **four** of the following : (4×3=12)
 - (a) Discuss various factors which affect the rate of demand.
 - (b) Draw and discuss the logistic curve for population growth.
 - (c) How would you include the requirement of water in the estimation of water demand for a municipal area ? What is coincident draft ?
 - (d) What are infiltration galleries and infiltration wells ? Explain both with neat sketch.
 - (e) Draw a schematic diagram of wet intake towers and its working.
 - (f) Define : Storage Coefficient, Coefficient of permeability and Coefficient of transmissibility.
2. Attempt any **four** of the following : (4×3=12)
 - (a) What are the various external and internal pressures that a pipe bears during its laying and operation ?

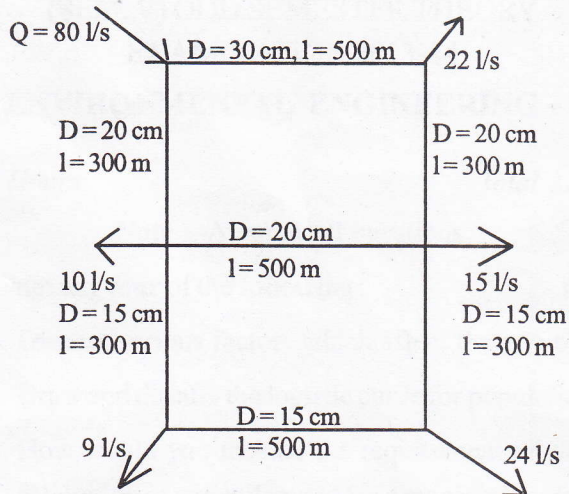
- (b) What is a Hume Pipe ? How is it manufactured ?
- (c) Explain the working of following with neat sketch :
 - (i) Gate Valve
 - (ii) Reflux Valve.
- (d) What is surge in a pipe network ? What provisions are made to safeguard a network from surge ?
- (e) Explain the following with neat sketch – Spigot and Socket joint.
- (f) Write down : Darcy Wesibach formula, Hazen William formula, modified Hazen William formula and Manning's formula.

3. Attempt any **three** of the following : (3×4=12)

- (a) Derive the Shield's formula for self cleansing velocity.
- (b) A stone-ware sewer, 30cm in diameter is laid at a gradient of 1 in 100. Using $N=0.013$ in Manning's formula, calculate the velocity and discharge when sewer is running full.
- (c) Discuss the role of minimum and maximum velocities in sewer line design. Also discuss effects of flow variation on velocity in a sewer.
- (d) Draw a diagram of a man-hole. Also discuss its purpose.
- (e) What is the importance of ventilations in sewers ? How is it provided in sewer line ?

4. Attempt any **two** of the following : (2×7=14)

- (a) Calculate the head losses and the corrected flows in the various pipes of a distribution network as shown in figure. The diameters and the lengths of the pipes used are given against each pipe (Fig. 1). Compute corrected flows after one correction.



(Fig. 1)

- (b) (i) What is Pseudo Loop ? 2
 (ii) Differentiate between Newton-Raphson Linear theory and Hardy Cross method of analysis of water distribution network. 5
- (c) (i) Discuss the various methods for laying a water distribution network. 4
 (ii) Compare the advantages and disadvantages of continuous and intermittent systems of water supply scheme. Under what conditions would you recommend the latter ? 3