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

PAPER ID : 2132 Roll No. | | | | | | | | | | |

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.

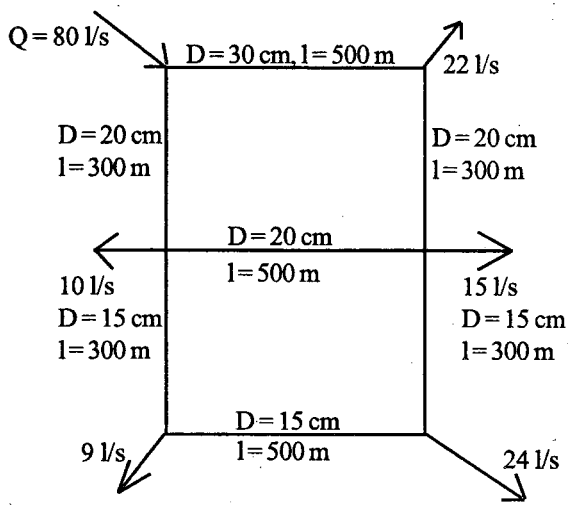
(c) Discuss the role of minimum and maximum velocities in sewer line design. Also discuss effects of flow variation on velocity in a sewer.

(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