

- (d) If the total area of the district is 36 Hectares and the maximum rainfall intensity is taken as 5 cm/hr; what is the total runoff for the district? Assume the average coefficient of runoff of the surface on which rain falls = 0.60.
- (e) Describe the procedure of laying of sewer line in a trench.
- (f) Write a short note on industrial waste water management.

(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) THEORY EXAMINATION 2011-12

**ENVIRONMENTAL ENGINEERING—I**

*Time : 2 Hours*

*Total Marks : 50*

**Note** :— Attempt **all** questions. Assume any data, not given, suitably.

1. Attempt any **four** parts of the following : **(3×4=12)**
- (a) Give the breakup of 'domestic water demand' as per IS 1172-1993.
  - (b) Describe 'fire demand'. Write any two formulae for estimating fire demand.
  - (c) What are 'Infiltration Galleries' and 'Infiltration Wells'? Explain both with neat sketches.
  - (d) Differentiate between the characteristics of surface and ground water in terms of water quality parameters.
  - (e) List various factors governing the selection of location of an intake structure.
  - (f) Explain the method of determining capacity of impounding reservoir.

2. Attempt any **two** parts of the following :  $(7 \times 2 = 14)$

(a) Discuss briefly the common stresses produced in the pipelines used for conveying water. What arrangements are made in their design and construction to resist them ?

(b) From a clear water reservoir, 3 m deep, water is to be pumped to an elevated reservoir at a height of 45 m at the constant rate of 9,00,000 liters per hour. The distance between both reservoirs is 1500 m. Determine the economical diameter of the rising main and the water horse power of the pump. Neglect minor losses and take  $f = 0.01$ .

(c) Explain the following joints used in water supply pipes with neat sketches :

(i) Socket and spigot joint

(ii) Expansion joint.

3. Attempt any **two** parts of the following :  $(6 \times 2 = 12)$

(a) Explain with a neat sketch as to how municipal water mains are connected to private buildings and houses for giving water supply connections. Describe the method of estimating capacity of balancing reservoir.

(b) Enumerate general guidelines for distribution system. Describe the Hardy-Cross Method of solving complex pipe network.

(c) Write short notes on the following :

(i) Different cocks and pipe fittings

(ii) Hot water installation.

4. Attempt any **four** parts of the following :  $(3 \times 4 = 12)$

(a) What do you mean by variation in sewage flow ? Explain average flow, dry weather flow, and maximum flow.

(b) Design an egg shaped sewer so as to cater to a residential colony in town having population of 8,000 . Assume other data.

(c) It is found that when the roughness of pipe is considered variable with depth of flow, the velocities equal to or more than those produced in sections flowing full, will be produced so long as the circular sewer sections flow above 80% of depth, as against half the depth (i.e. 50%) when roughness is not considered. However, sewers flowing with depths between 50% and 80% full, need not be placed on steeper gradients to be as self-cleaning as sewers flowing full. Explain.