Printed Pages : 3   **CE – 603**

B. Tech.

(SEM. VI) EXAMINATION, 2006-07

ENVIRONMENTAL ENGINEERING - I

Time : 3 Hours]   *[Total Marks :* **100**

Note :   (1)   *Attempt* **all** *questions.*
               (2)   *All questions carry* **equal** *marks.*

1   Attempt any **two** parts of the following :   **10×2=20**

(a)   What is significance of population forecast in Public Health Engineering? Explain in brief various factors that affect population growth.

(b)   Explain with neat sketch, the method of calculation of specific yield of an impounding reservoir from flood hydrograph of inflow.

(c)   What do you understnd by Runoff? Describe any two methods of calculation of runoff.

2   Attempt any **two** parts of the following :   **10×2=20**

(a)   Write a note of strainer type tube well, including design criteria for the same.

(b)   What do you understand by the recuperation test? Derive the equation used in the test.

(c) Draw schematic diagram of Dead end system and Grid-Iron system of layout of distribution system. Discuss the advantages and disadvantages of both systems.

3   Attempt any **two** parts of the following :   10×2=20

(a) A storage reservoir situated at 6 km from a city is to supply 60 MLD water for 12 hours daily. Total head loss from source to city is not to exceed 20 m. Assume minor losses equal to 10 $V^2/2g$. Determine the size of supply main by;

   (i) Darcy-Weisbach formula, taking $f = 0.015$, and

   (ii) Hazen-William formula, taking C = 130.

(b) Taking the flow equation $h_f = \dfrac{kLQ^n}{D^x}$,

   show that the diameter D_E of equivalent pipe for given pipes arranged in series is given by

   $$D_E = L_t \sqrt[x]{\dfrac{D^x}{L}}.$$

   Where L_t is total length of pipes in the given system. Also determine the value of x if Hazen-William formula is used.

(c) Explain Hardy-Cross method of balancing the flows by correcting the assumed heads for solving the network. Derive the expression you use for correction of assumed heads.

4   Attempt any **two** parts of the following :   **10×2=20**

(a)   Describe in brief various types of water carriage systems, stating advantages and disadvantages of each.

(b)   Discuss the variation rate of sewage. What are its effects on the design of sewer.

(c)   State the factors on which storm water flow of an area depends.

5   Attempt any **two** parts of the following :   **10×2=20**

(a)   A 60 cm dia sewer is to discharge 0.07 cumecs at a velocity as self-cleansing velocity as a sewer flowing full at 0.85 m/sec. Find depth, velocity of flow, and the required slope. Take uniform value of N = 0.015.

(b)   Draw a neat sketch of an egg shaped sewer and discuss:

(i)   Why egg-shaped sewers are preferred for combined sewerage system?

(ii)   Why egg-shaped sewers have become obsolete these days?

(c)   Why it is necessary to remove oil and grease from sewage? Discuss its functioning with the help of a neat sketch.

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