



Printed Pages : 3

CE – 603

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

PAPER ID : 0028

Roll No.

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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 understand 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 $10 \frac{V^2}{2g}$. 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 $h_f = \frac{kLQ^n}{D^x}$,

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

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

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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