



SF-8323

B. E. III (Sem. VI) (Civil) Examination

May / June – 2011

Water & Waste Water Engineering

(New Course)

Time : 3 Hours]

[Total Marks : 100

Instructions :

(1)

नीचे दशांशिक निशानीवाणी विगतो उत्तरवडी पर अवश्य कभवी. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
<input type="checkbox"/> B. E. 3 (Sem. 6) (Civil)	<input type="text"/>
Name of the Subject :	<input type="text"/>
<input type="checkbox"/> Water & Waste Water Engineering (New)	<input type="text"/>
Subject Code No. : <input type="text"/> 8 <input type="text"/> 3 <input type="text"/> 2 <input type="text"/> 3	Section No. (1, 2,.....) : <input type="text"/> Nil
Student's Signature	

- (2) Assuming missing data suitably if necessary.
(3) Draw sketch whenever necessary.
(4) Figures to the right indicate full marks for the question.

- 1 Define following terms : (any five) 10
- Wet well
 - Aqua duct
 - Elevated reservoir
 - Aeration
 - Flocculation
 - Backwashing.
- 2 Attempt any four from the following : 24
- Which are the different types of pipes used as conduit explain any one in detail.
 - Which are the different types of storage and distribution reservoir ? Explain elevated service reservoir.
 - Enlist different types of screens used and explain any one type of screen in detail.
 - Explain working of rapid sand filter with neat sketch.
 - Explain canal intake in detail with neat sketch.
 - Explain working of centrifugal pump in detail.

- 3** Solve any **two** from following : **16**
- (i) From a clear water reservoir 3m deep and maximum water level at R.L. 30.00 water is to be pumped to an elevated reservoir maximum water level at 75.00 at the constant rate of 900000 liters per hour. The distances between both are 1500 meters. Design the pump and rising main. $F=0.01$ (dimension less friction factor).
 - (ii) Design a circular sedimentation tank fitted with mechanical sludge remover for a water work which has to supply daily 4.2 million liter of water to the town. Detention period in tank for water is 4.5 hrs and depth of water in tank may assume as 3.3 m.
 - (iii) A city has population of 1,20,000 with an average rate of demand as 160 LPCD. Find area and number of units required for Rapid Sand filters.
- 4** Define following terms : (any **five**) **10**
- (i) Dry weather flow
 - (ii) Time of concentration
 - (iii) Aerobic process
 - (iv) B.O.D.
 - (v) Discrete Particle
 - (vi) Mixed Liquor
 - (vii) F/M Ratio.
- 5** Attempt any **four** from the following : **24**
- (i) Write short note on the variation in velocities. How it affects the design of sewers.
 - (ii) Write short note on hydraulically equivalent section.
 - (iii) Explain different types of settling taking place in waste water.
 - (iv) Write a note on Sludge Digester.
 - (v) Write a note on Grit Chamber.
 - (vi) What do you understand by Stabilization Ponds ? Discuss the advantages and disadvantages of the same.
- 6** Attempt any **two** from the following : **16**
- (i) A certain district of a city has a projected population of 50,000 residing over an area of 40 hectares. Find the design discharge for the sewer line, for following data.

- (a) Rate of water supply = 200 lpcd
- (b) Average impermeability coefficient for the entire area = 0.3.
- (c) Time of concentration = 50 minute

The sewer line is to be designed for a flow equivalent to the wet weather flow plus twice the dry weather flow. Use U.S. Ministry of health formula for calculation. Assume that 75% of water supply reaches in sewer as waste water.

- (ii) Design a circular settling tank for a town having population of 70,000 with waste water generation rate of 150 LPCD.
- (iii) A Grit chamber is to be designed to remove particles with a diameter of 0.2 mm and specific gravity 2.65, for an average working temperature of 20°C. A flow through velocity of 0.25 m/sec will be maintained by providing a proportional flow weir. Determine the channel dimension for a maximum waste water flow of 8,000 m³/day.
- (iv) The sewage flows from PST to standard rate trickling filter at a rate of 3.5 MLD having 5day BOD of 135 mg/lit. Determine depth and volume of filter, adopting a surface loading rate 2500l/m²/day. Find efficiency of filter.
- (v) Determine future population of satellite town by geometric increase method for the year 2011, given the following data.

Year	1951	1961	1971	1981
Population	93000	111000	132000	161000
