



SF-7047

B. E. - III (Sem. VI) (Civil) Examination
May / June - 2011
Environmental Engineering : Paper - I
(Old Syllabus)

Time : 3 Hours]

[Total Marks : 100

Instructions :

(1)

नीचे दशांशके निशानीवाणी विगतो उत्तरवडी पर अवश्य लपवी. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
<input type="text" value="B. E. - 3 (Sem. 6) (Civil)"/>	<input type="text"/>
Name of the Subject :	<input type="text"/>
<input type="text" value="Environmental Engineering - I (Old)"/>	<input type="text"/>
Subject Code No. : <input type="text" value="7"/> <input type="text" value="0"/> <input type="text" value="4"/> <input type="text" value="7"/>	<input type="text"/>
Section No. (1, 2,.....): <input type="text" value="Nil"/>	<input type="text"/>
	Student's Signature

- (2) Attempt **all** question.
(3) Figures to the right indicate full marks.
(4) Assume suitable data if required.

- 1 (a) Draw schematic layout of a water treatment plant which are adopted for treating water supplies. Discuss the types of screens and purpose of aeration in water treatment. **8**
- (b) Compare slow sand filter and rapid gravity filter. **7**
- 2 (a) Explain with neat sketch the working of dry feeding device for adding coagulant in treatment of water. **7**
- (b) Define flow through period and dilution period in a sedimentation basin. **7**

The maximum daily demand of a water purification plant is 12 million litres per day. Design the dimensions of a suitable sedimentation tank for the raw supplies, assuming a detention period of 6 hours and the velocity of flow as 20 cm per minute. Assume water depth in the tank as 4 m.

OR

- (b) Discuss the operation troubles in Rapid gravity filter and explain how to prevent those problems. **7**

3 Attempt any **three** : **7×3=21**

- (i) List the chemicals used for coagulation. Discuss the merits and demerits of any two coagulant.
- (ii) What is meant by disinfection in treating public water supply. Explain Super chlorination and Break point chlorination.
- (iii) Mention any three methods of water softening. Explain any one in detail.
- (iv) Name the various component unit (constituents) of a coagulation sedimentation tank and explain flocculation tank with a neat sketch.
- (v) Design six slow sand filter beds from the following data :
Population to be served = 50,000 persons
Per capita demand = 150 litres/head/day
Rate of filtration = 180 litres/hr/m²
Length of each bed = Twice the breadth
Assume maximum demand as 1.8 of Avg. demand out of 6 unit, kept one unit as stand by.

4 (a) Answer in one sentence or so : **5**

- (1) Distinguish between NTU and JTU.
- (2) Define MPN.
- (3) Enlist the formulae used for computing the quantity of water for fire demand.
- (4) Name any 2 types of pipes used in water supply.
- (5) What is priming ?

(b) State true or false : **5**

- (i) Geometric increase method and predicting population is suitable for new cities.
- (ii) The ground water is generally free from dissolved salts.
- (iii) For high and fluctuating heads, reciprocating pumps are used.
- (iv) In any ecosystem, the flow of energy is cyclic.
- (v) The presence of calcium and Magnesium ions in water causes hardness.

- (c) Which are various population forecasting methods ? 8
 In which situation the geometric increase method is used ? Calculate the population in year 2020 using geometric increase method for the below given data for a small town.

Year	Population
1960	8,000
1970	12,000
1980	17,000
1990	22,500

- 5 (a) Enlist main sources of water and discuss any two in detail. 7

OR

- (a) Discuss with the help of diagrams various methods of laying out the distribution system. 7

- (b) Attend any **two** : 10

- (1) From a clear water reservoir 3.0 m deep and maximum water level at 30.00 water is pumped to an elevated reservoir at 75.00 m at the constant rate of 9,00,000 litres/hour. The distance is 1500 m. Give the economical diameter of the rising main and the water horse power of the pump. Neglect minor losses and take $f = 0.01$.
- (2) Give the profile of the pipeline showing the position of various valves on it. Discuss different valves used in water supply pipe network.
- (3) Discuss the function of reciprocating pump with sketches.

- 6 Write short notes : (any **three**) 15

- (i) Rural water supply project
- (ii) Comparison of surface and subsurface sources
- (iii) MPN test
- (iv) Cast Iron pipes
- (v) Components of Ecosystem.