

B. Tech. 5th Semester (Civil Engg.)–XI

Examination, December–2013

WATER SUPPLY AND TREATMENT

Paper–CE-305-F

Time allowed : 3 hours]

[Maximum marks : 100

Note : Question No. 1 is compulsory. Students have to attempt five questions in total at least one question from each section. All questions carry equal marks.

- (i) Write short note on (a) BOD (b) pH value
- (ii) Chemical methods of removing suspended impurities from very large quantity of water.
- (iii) Explain the phenomenon of “Negative Head”.
- (iv) (a) Air valve (b) Reflux valve. 4×5=20

Section–I

In two periods each of 20 years, a city has grown from 40,000 to 1,60,000 and then 2,80,000. Determine :

- (a) The saturation population;
- (b) The equation of the logistic curve;
- (c) The expected population after 15 years. 20

3. (a) What are the four tests to be carried out for physical examination of water quality in a natural river flowing over an alluvial bed ? Explain briefly the procedure and instruments required for carry out the tests. 15
- (b) State the WHO international water quality standards relating to the presence of :
Calcium; copper; total solids; chloride; iron. 5

Section-II

4. The population of a town is 1,35,000 and the average per capita demand is 135 litres/day/capita. Design the coagulation cum sedimentation tank for supplying water to the town. The maximum demand may be taken as 1.5 times the average demands. Detention period is 5 hours for settling tank and 30 minutes for flocculent chamber. Flow rate is 850 litres/hour/m² of plan area. 20
5. (a) Why is chlorination considered necessary in the case of all public water supplies even when filtration is provided ? Mention the various methods by which chlorination of water is effected. 12
- (b) Explain why water is softened ? Describe with sketches the zeolite process of softening the hard water.

Section-III

6. (a) Describe with the sketches various types of joints used in C.I. pipes. 8
- (b) Public water supply is conveyed from the source to the centre of supply by combined system. Draw three separate longitudinal sections indicating these systems and show the positions of various details in each. 12
7. What is meant by economic diameter of a rising main ? How will you determine the economic diameter of a rising main for pumping water from a filter plant to the service reservoir of a town water supply ? 20

Section-IV

8. Describe the various layouts of distribution networks in a water supply system and state their merits and demerits. Suggest with reasons which of the system is appropriate for rural areas. 20
9. What is the purpose of elevated reservoir in water supply ? What are the types of reservoir ? How is the capacity of an overhead reservoir determined ? 20