C 29683 (Pages : 2) Name.....

Reg. No.....

SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION OCTOBER 2012

CE 09 703—ENVIRONMENTAL ENGINEERING—I

(2009 Admissions)

Time : Three Hours Maximum : 70 Marks

Answer **all** *questions.*

Part A

Short answer questions.
All questions *are* **compulsory.**

1. What is meant by design period ?
2. Write a short note on sources of water.
3. List out the various water treatment methods in order.
4. Explain the cleaning and maintenance process in water distribution system.
5. Write a short note on fluoridation.

(5 × 2 = 10 marks)

Part B

Answer any **four** *questions.*

6. Write a short note on factors affecting water consumption.
7. List out any ten drinking water standards as per BIS.
8. Differentiate between coagulation and flocculation.
9. Derive an expression for the settling velocity of a particle (Stoke's law) by clearly stating the assumptions.
10. Explain briefly on conduits used for transmitting water.
11. 8 mg. of copper is consumed with lime at a coagulation basin per litre water. Determine the quantity of copperas and the quick lime required to treat 10 million litres of water.

(4 × 5 = 20 marks)

Part C

Answer **all** *questions.*

12. The population of 5 decades from 1930 to 1970 is given below. Find out the population after one, two and three decades beyond the last known decade, by using any three methods for population forecasting.

Year	1970	1980	1990	2000	2010
Population	25,000	28,000	34,000	42,000	47,000

Or

Explain with the help of sketch a typical water supply scheme (with all the necessary components)

Turn over

13. Write a short note on various physical characteristics of water.

Or

Three wells each having a diameter of 10 cm. are installed at the vertices of an equilateral triangle 12 m. apart in a confined aquifer. The radius of influence of each well is 400 m. and coefficient of permeability, K in 20 m/day. The drawdown in each well is 2 m. The thickness of confined aquifer is 15 m. Find the discharge of each well and the percentage decrease in discharge because of well interference.

14. Design a rapid sand filter for treating 4 million litres per day water supply with all its principal components.

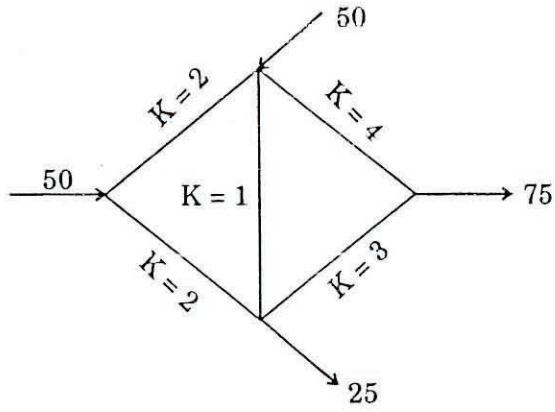
Or

Design and sketch a coagulation cum sedimentation tank with continuous flow for a population of 60,000 persons with a daily per capita water allowance of 120 liters. Make suitable assumption where needed.

15. Explain with the help of sketches, the various layout of water distribution pipe networks.

Or

Determine the distribution of flow in the pipe network shown below. The head loss (h_L) may be assumed as KQ^n. The flow is turbulent and pipes are rough. The value of K for each pipe is indicated in the pipe network given below. Use Hardy-Cross method.



(4 × 10 = 40 marks)