



Reg. No. : .....

Name : .....

**Seventh Semester B.Tech. Degree Examination, November 2015  
(2008 Scheme)**

**08.704 : ENVIRONMENTAL ENGINEERING – I (C)**

Time : 3 Hours

Max. Marks : 100

**PART – A**

Answer **all** questions.

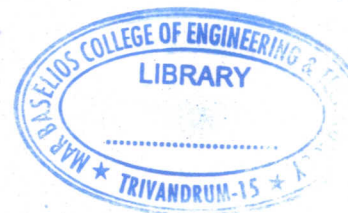
1. a) Differentiate surface sources and subsurface sources of water with respect to quality and quantity.
- b) Define percapita demand. How is it estimated ?
- c) What points should be considered in deciding the location of the pumping stations ?
- d) How will you determine the optimum coagulant quantity by Jar test ?
- e) Describe with a neat sketch the working of a pressure filter.
- f) Explain breakpoint chlorination and super chlorination.
- g) What do you understand by an “equivalent pipe” ? How do you determine its length when the pipes are :
  - i) In series
  - ii) In parallel.
- h) Compare lime soda process and zeolite process. **(8×5=40 Marks)**

**PART – B**

**Module – I**

2. a) What is meant by design period and population forecasts ? What are the factors affecting design period ? **6**
- b) Explain the population forecasting methods. **14**

OR



P.T.O.



3. a) In a pumping station, 1800 cumecs water is to be raised per day from an intake well to a sedimentation tank under the static head of 21 m. Lengths of suction pipe and rising main are 40 m and 150 m respectively. Diameter of pipes is 50 cm. There are 2 shifts of working of pumps, each of 8 hours. Take  $f' = 0.01$  and combined efficiency of motor and pump as 80%. Recommend the number of units of pumps each having BHP of 30. 10
- b) What is an intake structure ? Enumerate the various types of intakes and explain in detail any one of them. 10

### Module – II

4. a) With a neat sketch explain the various constituents of a coagulation sedimentation tank. 10
- b) Define settling velocity. Derive Stoke's law for settling velocity. What are the assumptions in deriving Stoke's law ? 10

OR

5. Design a rapid sand filter to treat 5 million litres of water per day. Assume suitable data. 20

### Module – III

6. a) Explain Hardycross method of analysis of pipe network. 10
- b) A pipe network in the form of a triangle ABC has inflow of  $5 \text{ m}^3/\text{sec}$  and  $4 \text{ m}^3/\text{sec}$  at A and B respectively. The outflow at C is  $9 \text{ m}^3/\text{sec}$ . Given  $K_{AB} = 10$ ,  $K_{BC} = 50$ ,  $K_{AC} = 20$ . Compute discharges in each pipeline by Hardycross method.  $HL = K.Q^2$ . 10

OR

7. a) Explain the use of chlorine as a disinfecting agent with reference to : 12
- i) Its disinfecting action
  - ii) Its doses
  - iii) Its forms.
- b) Explain how fluoridation and defluoridation is carried out in water treatment. 8

