

**B.Tech. CIVIL ENGINEERING (BTCLEVI)**

**Term-End Examination**

**June, 2018**

00763

**BICE-014 : ENVIRONMENTAL ENGINEERING – I**

*Time : 3 hours*

*Maximum Marks : 70*

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*Note : Answer any **five** questions. All questions carry equal marks. Assume suitable data, if missing. Use of scientific calculator is allowed.*

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1. (a) What are the various sources of water ?  
Discuss the characteristics of river water. 8
- (b) What are the various factors which directly affect the per capita demand of a town ? 6
  
2. Water has to be supplied to a town with a population of one lakh at the rate of 150 l/c/d from a river 2000 m away. The difference in elevation between the lowest water level in the sump and reservoir is 36 m. If the demand has to be supplied in 8 hrs, determine the size of the main and the B.H.P. of the pumps required. Assume maximum daily demand as 1.5 times the average daily demand. Assume  $f = 0.0075$ , velocity in the pipe 2.4 m/sec and efficiency of pump 80%. 14

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3. How are cast iron pipes joined by spigot and socket joint ? Draw a neat sketch of the joint. What are the other pipe joints used for cast iron pipes ? Briefly describe them. 14
  4. What are the requirements of a good water supply scheme ? Describe gravity and pumping distribution systems in detail. 14
  5. What are the common impurities found in natural water ? Explain their effect on the quality of water. 14
  6. A grit chamber with a proportionate flow weir at its outlet is to be designed to handle a sewage flow from a population of 50,000. Design the grit chamber. State, very clearly, assumptions made, if any. 14
  7. (a) Describe the procedure of lime-soda ash process for water softening. 8  
(b) What do you understand by the odour and taste in the water ? Why do odour and taste need to be removed ? 6
  8. Write short notes on any **two** of the following :  $2 \times 7 = 14$ 
    - (a) Water-borne diseases
    - (b) Disinfection
    - (c) Defluoridation
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