Question-Paper   Code: **91239**   1

B.E.IB.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2014.

Fifth Semester

Civil Engineering

CE *2304/CE 53/10111* CE 504 - ENVIRONMENTAL ENGINEERING - I

(Regulation *2008/2010)*

(Common to 10111 CE 504 - Environmental Engineering - I for
'B.E. (Part-Time) Fourth Semester Civil Engineering - Regulation 2010)

Ti~e: Three hours www.universityquestions.inMaxim,u~   :'100 marks

.Answer ALL.questions.

PART A-   (10 x 2 = 20 'marks)

1.   State the objectives of public water supply scheme,

2.   Distinguish between carbonate and non-carbonate hardness .

. 3.   Enlist the external forces acting 'on water transmission main if the pipe is laid
under heavy traffic.

4.   What is meant by economic diameter of a pumping main?

5.   What is the significance of velocity gradient **in** flocculator design?

6.'   What do you mean by break point chlorination?

7.   List out any. two methods of de fluoridation of water.

8.   Distinguish between-physical adsorption and chemical adsorption.

9.   Why are the requirements of water distribution system?

10.   Enumerate the methods of leak detection in water distribution system.

PART B -   (5 x 16 = 80 marks)

11. (a) The. population of a. town panchayat as per past' census records are furnished below. Forecast the. population in the year 2031 and 2041 using the following methods:

   (i) Arithmetical increase method. (5)

   (ii) Geometrical increase method. (6)

   (iii) .Incremental increase method. (5)

Census year	1941	1951	1961	1971	1981	1991	2001	2011
Population	35642	39487	46S16	57859	70458	78543	92131	116500

   Or

   (b) . (i) .. Discuss the factors to be considered in fixing the design periods for water supply components. ., .(8)

   (ii) Explain the various sources of surface and groundwater. (8)

12. . (a) In a water supply scheme to be designed for serving a population of 121akhs, the storagereservoir is situated at 9 km away from the cityand the loss of head from the source to city is 19.5 m. Calculate the size of the supply' main b~»g_'DQFCy--$Wejsha"b formula as' ~ as bv using Hazen's formula assuming a maximum daily. demand of 15U Lpcd and 2/3 of the daily supply to be pumped in 10 hours. Assume friction factor (4f) for the pipe material as 0.005 in Weishbach formula and Cn = 110 in Hazen's formula.

   Or

   '(by (i) What are the important considerations, which govern the selection of site of an intake? (8)

   (ii). Discuss the factors to be considered in the selection of pipe material for water transmission. (8)

13. (a) Design a clariflocculator for a proposed water treatment plant with a capacity of 80 MUd and draw a neat sketch of the unit.

   Or

   (b). A new township is to have a population of 6,00,000 and 90 Lpcd of water supply. Design a rapid sand filter unit with details 0f under drainage and water washing including gutter arrangement. Limit the.maximum spent backwash water as 3.5 %.

2   **91239**

14. (a) Design a zeolite softener for an industrial establishment .working for 2 shifts of 8 hours each. for the following data and draw a neat sketch of the unit.

Soft water requirement	=	2.5 MLld in 16 hours'
Raw water' hardness Product	-	800 mg/L as $CaCO_3$
water hardness Exchange	=	50 mg/L as $CaCO_3$
capacity of the resin	=	35 kg *(CaC03)/m3*
Salt required for regeneration	=	50 kg (NaCI)/m^3 of resin

Or

(b) .Draw a schematic diagram of a DM plant and explain the mechanism of cations as well as anions removal- Also briefly outline the design procedure.

15. . (a) Describe the various layouts of distribution network in a water supply system and state their advantages and disadvantages;

Or

(b) Draw a sketch of a water supply service corinection from the street main to a .residential building and state the functions of each fitting.

3   **91239**