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# 320653(20)

## B. E. (Sixth Semester) Examination, April-May 2021

**(New Scheme)**

**(Civil Engg. Branch)**

**ENVIRONMENTAL ENGINEERING-I**

***Time Allowed : Three hours***

***Maximum Marks : 80***

***Minimum Pass Marks : 28***

***Note :*** *Part (a) of each question is compulsory and carries 02 marks. Attempt any **two** parts from (b), (c) & (d) and carries 7 marks each.*

### Unit-I

**1.** (a) Define population forecasting.

(b) Define intake and factors considered for intake site.

(c) Write various water demands required, discuss in detail.

(d) Predict the population for the years 2021, 2031, 2041 from the following census figures of a town.

| Year | Population |
|---|---|
| 1961 | 8,58,545 |
| 1971 | 10,15,672 |
| 1981 | 12,01,553 |
| 1991 | 16,91,538 |
| 2001 | 20,77,820 |
| 2011 | 25,85,862 |

## Unit-II

**2.** (a) What do you mean by sedimentation?

(b) Write physical, chemical and biological characteristics of water.

(c) Explain jar test with neat sketch.

(d) The average daily demand at a town has been estimated as 8 million liters per day. Design a suitable sedimentation tank assuming a detention period of 5 hours and velocity of flow as 22 cm per minute.





## Unit-III

**3.** (a) What is break point chlorination?

(b) Differentiate between rapid and slow sand filters.

(c) Write the name of several disinfection methods and describe one method with sketch.

(d) A city is to install rapid sand filters downstream of the clarifiers. The design loading rate is selected to be 160 $m^3/(m^2d)$. The design capacity of the water works is 0·35 $m^3/s$. The maximum surface per filter is limited to 50 $m^2$. Design the number and size of filters and calculate the normal filtration rate.

## Unit-IV

**4.** (a) Define Reservoirs.

(b) Write requirements of good water distribution system.

(c) Discuss with neat sketch about Zeolite method.

(d) An exhausted zeolite softener was regenerated by passing 100 litres of NaCl. Solution containing 150 gm per lit. of NaCl. How many lit. of a sample of

$H_2O$ of hardness 300 ppm can be softened by this softener?

(Given at wts. for C = 12, O = 16, Na = 23, Cl = 35·5, Ca = 40).

## Unit-V

5. (a) Define ppm and PM.

(b) Describe effects of air pollution in detail.

(c) Explain air pollution control methods in brief.

(d) Justify with neat sketch about electrostatic precipitator.