

Roll No. ....

Total Pages : 3

**002405**

**May 2024**

**B.Tech. (Civil) - IV SEMESTER  
ENVIRONMENTAL ENGINEERING  
(PCC-CED-208)**

Time : 3 Hours]

[Max. Marks : 75

**Instructions :**

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
2. *Answer any four questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

**PART-A**

1. (a) What is per capita demand? (1.5)  
(b) What is design period? (1.5)  
(c) Compare and contrast between carbonate and non-carbonate hardness. (1.5)  
(d) Differentiate between unit operation and unit process. (1.5)

002405/170/111/388

**271** P.T.O.

- (e) Explain the term coagulation. (1.5)
- (f) What is breakpoint chlorination? (1.5)
- (g) Define: Detention time and surface overflow rate. (1.5)
- (h) Differentiate between demineralization and desalination. (1.5)
- (i) What are the requirements of a distribution system? (1.5)
- (j) How will you calculate total head in the design of pumps for water supply schemes? (1.5)

### PART-B

- 2. (a) Enumerate and explain the characteristics of surface water and ground water. Also state their environmental significance. (10)
- (b) Classify the types of intakes. Also explain the working of a reservoir intake with a neat sketch. (5)
- 3. (a) Develop the design for a rectangular sedimentation tank for 5MLD flow. (5)
- (b) Explain about rapid sand filter with suitable diagram and also write its advantages over them. (10)
- 4. (a) Briefly, explain the various chlorination methods. (5)
- (b) Design a rapid sand filter to treat a city of population 100000 with an average per capita demand of 160 lpcd. (10)

- 5. (a) Explain the various methods of removing excess Iron and Manganese from Ground water. (5)
- (b) Explain the Zeolite process for the removal of permanent hardness from water. (10)
- 6. (a) Explain the different methods of detection of leaks in water distribution system. (10)
- (b) How will you calculate the service capacity of the reservoir? (5)
- 7. Discuss with sketches the various types of layouts of distribution system and state their advantages and disadvantages. (15)