

Roll No.

Total Pages : 3

002405

May, 2023

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) Define Hardness of water. (1.5)
- (b) Explain Population Forecasting. (1.5)
- (c) List all the types of water demands. (1.5)
- (d) What is Coincident Draft. (1.5)
- (e) What is the permissible limit for Fluoride content. (1.5)

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- (f) List the instruments used for measurement of turbidity. (1.5)
- (g) Define TON. (1.5)
- (h) What is the significance of Pumps. (1.5)
- (i) What are the types of sedimentation. (1.5)
- (j) Provide numerical expression for stokes law. (1.5)

PART-B

- 2. (a) A continuous flow sedimentation tank is 3.5 m deep and 65 m long. The flow velocity observed is 1.22 cm/sec. What size of particle of S.G. 2.65 may be effectively removed. Assume $T = 25$ degree Celsius and viscosity = $0.01 \text{ cm}^2/\text{sec}$. (10)
- (b) Explain Sedimentation with coagulation in detail. (5)
- 3. (a) Calculate the carbonate & non-carbonate hardness of a water sample if the total hardness and alkalinity of sample are 250 mg/L and 200 mg/L (as CaCo_3) respectively. (5)
- (b) Explain physical, chemical & biological water quality parameters in detail. (10)
- 4. Enlist any five important chemical characteristics of raw water. Mention their method of analysis and its acceptable values. (15)

- 5: (a) Explain the process of disinfection using Chicks: Watson Law. (10)
- (b) Explain Ion Exchange Process with examples. (5)
- 6. With the help of the common data find the population for the year 2020 using the (15)
 - 1. Arithmetic increase method
 - 2. Geometric increase method
 - 3. Incremental increase method.

Year	1930	1940	1950	1960	1970
Population	25000	28000	34000	42000	47000

- 7. Explain any five water treatment processes in detail (with diagrams wherever applicable). (15)