

9/12
AO

Sr. No. 019503

December 2023

B.Tech. (ENV) V SEMESTER

Water Engineering Design and Application (PCC-ENV-503)

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.
 4. Use of non-programmable scientific calculator is allowed.

PART -A

- Q1 (a) What are the various criteria for selection of water source? (1.5)
(b) What are the various population forecasting methods? (1.5)
(c) Define biological water quality parameters. (1.5)
(d) What is flocculation? (1.5)
(e) What are the various catalysts used in coagulation? (1.5)
(f) Define BOD and COD. (1.5)
(g) Define ion exchange method. (1.5)
(h) What are the various types of pumps? (1.5)
(i) What are the various valves used in water supply system? (1.5)
(j) What is desalination? (1.5)

PART -B

- Q2 (a) Describe various important tests conducted for chemical examination of water. (10)
(b) What do you understand by 'per capita demand' of water? How is it determined? Explain in brief various factors that affect population growth. (5)
- Q3 (a) What are the WHO guidelines for drinking water? (5)
(b) Describe the various methods of distributing water and discuss the advantages and disadvantages of each. (10)
- Q4 Explain about physical characteristics of water in detail with their respective limits defined by BIS. (15)
- Q5 (a) Give important differences between Slow Sand Filters and Rapid Gravity Filters. (5)
(b) Describe the various methods of distributing water and discuss the advantages and disadvantages of each. (10)

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PTD

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- Q6 (a) In continuous flow settling tank 3 m deep and 60 m long, what flow velocity of water would you recommend for effective removal of 0.025 mm particles at 25°C. The specific gravity of particles is 2.65 and kinematic viscosity for water may be taken as 0.01 cm²/s. (10)
- (b) Chlorine usage in the treatment of 20,000 cubic meter of water per day is 8 kg/day. The residual chlorine after 10 minutes contact is 0.2 mg/l. Calculate the dosage of chlorine in mg/l and chlorine demand of the water. (5)

- Q7 Explain about dead end system with neat sketch. What are the advantages and disadvantages of dead end system? (15)

PART-A

- Q1 (a) What are the various criteria for selection of water source? (1.5)
- (b) What are the various population forecasting methods? (1.5)
- (c) Define biological water quality parameters. (1.5)
- (d) What is flocculation? (1.5)
- (e) What are the various catalysts used in coagulation? (1.5)
- (f) Define BOD and COD. (1.5)
- (g) Define ion exchange method. (1.5)
- (h) What are the various types of pumps? (1.5)
- (i) What are the various valves used in water supply systems? (1.5)
- (j) What is desalination? (1.5)

PART-B

- Q2 (a) Describe various important tests conducted for chemical examination of water. (10)
- (b) What do you understand by per capita demand of water? How is it determined? Explain in brief various factors that affect population growth. (5)
- Q3 (a) What are the WHO guidelines for drinking water? (5)
- (b) Describe the various methods of distributing water and discuss the advantages and disadvantages of each. (10)
- Q4 Explain about physical characteristics of water in detail with their respective limits defined by IS: (15)
- Q5 (a) Give important differences between slow sand filters and Rapid Gravity filters. (5)
- (b) Describe the various methods of distributing water and discuss the advantages and disadvantages of each. (10)

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