

# **KAMARAJ COLLEGE (Autonomous)**

Accredited with A+ Grade by NAAC

(Affiliated to Manonmaniam Sundaranar University, Tirunelveli)

THOOTHUKUDI – 628 003

**(5 Pages)**

**Reg. No: .....**

**Question Code No : 250003305**

**Course Code : 24PSPH31**

**PG Degree - End Semester Examinations, November 2025**

**Third Semester**

**M.Sc. PHYSICS**

**Sewage and Waste Water Treatment and Reuse**

**(For those who joined in July 2024 onwards)**

**Time : 3Hours**

**Maximum : 75 Marks**

**PART – A (10 × 1 = 10 Marks)**

**Answer ALL Questions**

**Choose the correct answer :**

1. The process of contact and adhesion whereby the particles of a dispersion form larger size clusters is \_\_\_\_\_  
(a) Coagulation (b) Flocculation  
(c) Sedimentation (d) Suspension
2. The primary purpose of flocculation in water treatment is to  
(a) Neutralize the electric charge of suspended particles

- (b) Increase the size of suspended particles into larger clusters
  - (c) Separate sludge from the treated water
  - (d) Disinfect the water
3. Which of the following is one of the method of sterilization?
- (a) Autoclaving
  - (b) Pasteurization
  - (c) Filtration
  - (d) All the above
4. An agent that inhibits the growth and reproduction of bacteria without necessarily killing them.
- (a) Bacteriostatic
  - (b) Bactericidal
  - (c) Aseptic
  - (d) Disinfectant
5. The primary purpose of adding coagulants like alum to water during pretreatment is to:
- (a) Increase the pH
  - (b) Neutralize the charges of suspended particles
  - (c) Add residual disinfection
  - (d) Remove dissolved salts
6. Which of these disinfectants provides a long-lasting residual effect in the distribution system?
- (a) Ozone
  - (b) UV radiation
  - (c) Chlorine
  - (d) Hydrogen peroxide

7. Which of the following is a method of physical disinfection of water?
- (a) Boiling (b) UV  
(c) Distillation (d) All the above
8. \_\_\_\_\_ energy is then applied to the electrochemical system.
- (a) IR (b) Solar  
(c) Microwave (d) Wind
9. Which of the following organisms is a common indicator of fecal contamination in drinking water?
- (a) Salmonella (b) E. coli  
(c) Giardia (d) Streptococcus
10. The most efficient method of irrigation for minimizing water loss through evaporation and runoff is
- (a) Flood irrigation (b) Overhead sprinklers  
(c) Furrow irrigation (d) Drip irrigation

**PART - B (5 X 5 = 25 Marks)**

**Answer ALL Questions choosing either (a) or (b).**

**Answer should not exceed 250 words.**

11. (a) Explain the process of flocculation and its significance in the reuse of water.

**(OR)**

(b) What are the chemical and biological methods of vector eradication?

12. (a) Mention the factors affecting disinfection.

**(OR)**

(b) Define sterilization, sterilant and aseptic

13. (a) What is meant by Disinfection By-Products (DBPs)?

**(OR)**

(b) What is meant by electrochemical disinfection? How does it work?

14. (a) Mention the effectiveness of ultraviolet radiation in physical method of disinfection.

**(OR)**

(b) What is heat treatment in physical disinfection.

15. (a) Write a note on drip irrigation in water conservation.

**(OR)**

(b) Discuss the various processes used to create safe drinking water.

**PART - C (5 X 8 = 40 Marks)**

**Answer ALL Questions choosing either (a) or (b).**

**Answer should not exceed 600 words.**

16. (a) Compare sedimentation with coagulation.

**(OR)**

(b) What is filtration? Mention different types of filter and their role in the recovery of waste water.

17. (a) Justify how the process of chlorination act as a common method of disinfection in water treatment.

**(OR)**

(b) What is sterilant and mention the common sterilization methods.

18. (a) Discuss the theory of chemical method of disinfection.

**(OR)**

(b) Differentiate bacteriostatic from bactericidal.

19. (a) Give the principle and applications of solar disinfection.

**(OR)**

(b) Discuss about various physical disinfection methods.

20. (a) Discuss about water conservation and reuse management.

**(OR)**

(b) Explain the environmental sustainability in water management.