

(7 pages)

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Code No. : 5468

Sub. Code : WPHSE 46

M.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2025

Fourth Semester

Physics – Elective

Skill Enhancement Course III — SEWAGE AND
WASTE WATER TREATMENT AND REUSE

(For those who joined in July 2023 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (15 × 1 = 15 marks)

Answer ALL questions.

Choose the correct answer :

1. What is the process called when small particles clump together to form larger particles during coagulation?
- (a) Flocculation (b) Sedimentation
(c) Filtration (d) Disinfection

2. In the sedimentation process, what force causes the flocculated particles to settle down?
- (a) Gravity (b) Buoyancy
(c) Surface tension (d) Chemical reaction
3. Which type of sedimentation tank is most commonly used for removing flocculated particles?
- (a) Circular tank
(b) Rectangular tank
(c) Hopper-bottom tank
(d) All of the above
4. Which of the following is NOT a method of sterilization?
- (a) Autoclaving (b) Pasteurization
(c) Gamma radiation (d) Filtration
5. Which of the following is a common disinfectant?
- (a) Alcohol (b) Hydrogen peroxide
(c) Bleach (d) All of the above
6. UV radiation is most effective against which of the following microorganisms?
- (a) Bacteria (b) Viruses
(c) Fungi (d) Spores

7. Which of the following is an example of a high-level disinfectant?
- (a) Soap (b) Hydrogen peroxide
(c) Vinegar (d) Alcohol
8. Which of the following is NOT a characteristic of an ideal disinfectant?
- (a) Broad spectrum activity
(b) Toxicity to humans
(c) Stability
(d) Solubility in water
9. Chemical disinfectants are commonly used in:
- (a) Sterilization of medical instruments
(b) Disinfection of surfaces
(c) Preservation of food
(d) All of the above
10. Which factor does NOT affect the effectiveness of SODIS?
- (a) Water turbidity
(b) Weather conditions
(c) Ambient temperature
(d) Container material

11. How does SODIS inactivate pathogens?
- (a) By removing them through filtration
(b) By chemically destroying them
(c) By damaging their DNA and preventing reproduction
(d) By heating the water to boiling point
12. What is the recommended method for pre-treatment of turbid water before SODIS?
- (a) Chlorination
(b) Filtration through a cloth or sand filter
(c) Boiling
(d) Adding alum
13. Which type of electrode material is commonly used in electrochemical oxidation for water disinfection?
- (a) Copper
(b) Aluminum
(c) Titanium dioxide (TiO₂)
(d) Stainless steel

14. What is a potential drawback of using electrochemical oxidation for water disinfection?
- (a) High capital cost
 - (b) Formation of harmful byproducts
 - (c) Ineffectiveness against certain microorganisms
 - (d) All of the above
15. Which of the following factors can influence the effectiveness of electrochemical oxidation for water disinfection?
- (a) Water temperature
 - (b) pH level
 - (c) Presence of organic matter
 - (d) All of the above

PART B — (5 × 4 = 20 marks)

Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 250 words.

16. (a) Explain the role of flocculation in recovery and reuse of water.

Or

- (b) Discuss the role of sand filters in recovery and reuse of water.

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17. (a) Give an account of UV radiation in disinfection.

Or

- (b) Discuss the aseptic and sterile in disinfection.

18. (a) Explain the disinfection by products.

Or

- (b) Discuss the chemical disinfection treatments.

19. (a) Explain the solar disinfection in physical disinfection.

Or

- (b) Discuss the heat treatment in physical disinfection.

20. (a) Explain the function of sedimentation in reuse of water.

Or

- (b) Discuss the chlorination disinfection.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 600 words.

21. (a) Explain the role sedimentation with coagulation in reuse of water.

Or

- (b) Discuss the chemical vector eradication in reuse of water.

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22. (a) Explain the factors affecting disinfection.

Or

(b) Discuss the bacteriostatic and bacterial disinfection.

23. (a) Explain the theory of chemical disinfection.

Or

(b) Explain the chlorination other chemical methods.

24. (a) Explain the role of filtration methods in physical disinfection.

Or

(b) Discuss the electrochemical oxidation water disinfection by microwave heating.

25. (a) Explain the flocculation agents as pretreatment.

Or

(b) Explain the role of UV radiation in chemical disinfection.