

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2022
(Third Semester)

Branch – ENVIRONMENTAL SCIENCE

DISCIPLINE SPECIFIC ELECTIVE – I : ENVIRONMENTAL ENGINEERING

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks (5 x 1 = 5)

1. Which of the following should be provided in the case where aeration is absent?
(i) Screening devices (ii) Mechanical mixers
(iii) Grit removers (iv) Sedimentation tank
2. What percent of corrugated plastic discs are submerged in rotating biological contractors?
(i) 20 (ii) 50
(iii) 80 (iv) 40
3. What is the intermediate zone composed of in aerobic-anaerobic ponds?
(i) Algae (ii) Aerobic bacteria
(iii) Facultative bacteria (iv) Organic solids
4. Ion exchange resins are
(i) Inorganic polymers (ii) Organic polymers
(iii) Sandy materials (iv) Liquids
5. Which of the following is incorrect regarding the fabric filter?
(i) They can remove very small particle
(ii) They are liable to chemical attack
(iii) They have low efficiency in comparison to venturi scrubber
(iv) They can handle large volume of gas at relatively high speed

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks (5 x 3 = 15)

6. a. State the significance of weir loading rate in sedimentation tank design.
OR
b. Explain the purpose of an equalization chamber.
7. a. Explain the working principles of rotating biological contactor.
OR
b. Evaluate the significance of sludge volume index (SVI) in the performance of activated sludge process.
8. a. Explain the purpose of sludge digestion.
OR
b. Illustrate the four stages of anaerobic digestion.
9. a. Explain the mechanism of disinfection process.
OR
b. State the design criteria for primary sedimentation tank.
10. a. Explain the procedure for fixing minimum stack height.
OR
b. Evaluate the factors influencing the efficiency of cyclone collector.

Cont...

SECTION -C (30 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** Marks (5 x 6 = 30)

11. a. Explain the various steps involved in primary treatment process of wastewater.
OR
b. Explain the types of grit chambers with neat sketch.
12. a. Design the various components of trickling filter unit and their functions with neat sketch.
OR
b. Critically analyze the advantages and limitations of activated sludge treatment process.
13. a. Differentiate the process of sludge thickening and sludge dewatering.
OR
b. Elucidate the advantages of Up-flow Anaerobic Sludge Blanket (UASB) reactor technology.
14. a. Explain the differences between slow and rapid sand filters.
OR
b. Describe the ion exchange process and its industrial applications.
15. a. Illustrate the mechanism of an electrostatic precipitator with diagram.
OR
b. Explain the advantages and disadvantages of settling chambers.

Z-Z-Z END