

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
MSc DEGREE EXAMINATION DECEMBER 2023
(Third Semester)

Branch – ENVIRONMENTAL SCIENCE

MAJOR ELECTIVE COURSE – 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 one of the following is a unit process?
(i) Screening (ii) Grit chamber
(iii) Anaerobic digestion (iv) sedimentation
- 2 Sludge Volume Index (SVI) for municipal sewage is approximately lying in the range of _____.
(i) 80 to 120 (ii) 80 to 130
(iii) 80 to 140 (iv) 80 to 150
- 3 The reaction with the addition of small cylindrical shaped polythene carrier elements in aerated or non-aerated basin to support biofilm growth is known as
(i) Membrane Bio-Reactor (MBR)
(ii) Moving – Bed Biofilm Reactor (MBBR)
(iii) Sequencing Batch Reactor (SBR)
(iv) Upflow Anaerobic Sludge Blanket Reactor (UASBR)
- 4 The potential deposition and accumulation of constituents in the feed stream on the membrane is called as
(i) Membrane deposition (ii) Membrane fouling
(iii) Membrane fixing (iv) Membrane plugging
- 5 Magnitude of centrifugal force in a cyclone is
(i) Directly proportional to square of the inlet velocity and inversely proportional to the radius of the cyclone
(ii) Inversely proportional to square of the inlet velocity and inversely proportional to the radius of the cyclone
(iii) Inversely proportional to square of the inlet velocity and directly proportional to the radius of the cyclone
(iv) Directly proportional to square of the inlet velocity and directly proportional to the radius of the cyclone

SECTION - B (15 Marks)

Answer ALL Questions

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

- 6 a Describe the unit operations used in primary sedimentation.
OR
- b What are the major type and sources of grit in municipal wastewater? Describe treatment methods used to remove grit.

Cont...

- 7 a Justify why are aeration devices a vital part in biological reactors? Describe any two aeration techniques used in biological reactors.
OR
b Discuss Mean Cell Residence Time and its application in wastewater treatment.
- 8 a Identify the features of Sequencing Batch Reactor.
OR
b Explain the effects of pH and temperature on anaerobic treatment.
- 9 a Illustrate demineralizers and ion exchange process.
OR
b Classify methods of filtration.
- 10 a Evaluate various noise control measures.
OR
b Differentiate wet and dry scrubbers.

SECTION -C (30 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 x 6 = 30)

- 11 a Explain the types of settling and its role in wastewater treatment.
OR
b Elucidate the principles and design criteria for screening, equalization tank and settling tanks.
- 12 a Classify aerobic treatment process and state its application in wastewater treatment.
OR
b Elucidate the bio-kinetic coefficient, specific growth rate and yield coefficient in activated sludge process.
- 13 a Evaluate the performance of anaerobic reactors with an example.
OR
b Analyze the role of Up-flow Anaerobic Sludge Blanket Reactor in wastewater treatment.
- 14 a Appraise the factors affecting the performance of wastewater treatment plant.
OR
b Determine the efficacy of disinfection in the removal of pathogenic organisms.
- 15 a Describe the mechanism of high efficiency particulate filter system.
OR
b Elucidate the mechanism of sensor based air pollution monitoring system.

Z-Z-Z

END