

B.E. Eighth Semester (Civil Engineering) (CGS)
Environmental Engineering - II : 8 CE 02

P. Pages : 2

Time : Three Hours



AU - 3536

Max. Marks : 80

- Notes :
1. Answer **three** question from Section A and **three** question from Section B.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Assume suitable data wherever necessary.
 4. Diagrams and chemical equations should be given wherever necessary.
 5. Illustrate your answer necessary with the help of neat sketches.
 6. Discuss the reaction, mechanism wherever necessary.
 7. Use of pen Blue/Black ink/refill only for writing the answer book.

SECTION - A

1. a) State the factors affecting dry weather flow. 2
b) Explain graphically the hourly variation of sewage flow. 5
c) Design a sewer for a population of 50,000 with per capita water supply of 150 litres/day. The slope available is 1 in 500 and 80% of the water supplied emerges as sewage. The sewer is to be designed to carry 4 times the DWF when running full. Assume $N = 0.012$ and compute the velocity of flow when running full. 7

OR

2. a) Explain the term "Time of concentration" and its significance in determining the storm water flow. 4
b) What are the problems commonly encountered in the maintenance of sewers? 6
c) Differentiate between combined and separate systems of sewage. Give the conditions favourable for the adoption of each one of them. 6
3. a) What are the objectives of sewage treatment? Draw a flow diagram of conventional sewage treatment plant and indicate different units. 6
b) What is BOD? The one day 30°C BOD of sewage sample is 120 mg/l. Calculate its 5 day 20°C BOD. Assume the deoxygenation constant at 20°C , K_{20} (base 10) as 0.1 7

OR

4. a) Differentiate between grab and composite sewage samples. Enlist the physical and chemical examinations of waste water. 6
b) What is screening? Estimate the screen requirement for a plant treating a peak flow of 40 MLD of sewage. Assume suitable data. 7
5. a) Explain with flow diagram the principle and working of activated sludge process. 6
b) Design suitable dimensions of a conventional circular trickling filter units for treating 5.5 MLD of sewage. The BOD of sewage is 160 mg/l. Assume suitable data. 7

OR

6. a) State the advantages of recirculation in high rate trickling filter. 3
b) Explain the sloughing of filter. 4
c) Enumerate the various modifications of the basic activated sludge process. Explain step aeration process with sketch. 6
7. a) Design a septic tank for a colony of 200 persons provided with an assured water supply at a rate of 135 litres per person per day. Assume suitable data needed. Draw a sketch of designed unit. 7
b) What is oxidation pond? Explain the Bacterial – Algal- symbiosis in an oxidation pond. 7

OR

8. a) What is meant by digestion of sludge? Explain the effect of temperature on sludge digestion. 7
b) What is meant by disposal of sewage by dilution and by land treatment? Explain the conditions favorable for the adoption of these sewage disposal methods. 7
9. a) Explain physical characteristics of solid waste. 6
b) Discuss the different methods of collection of solid waste generated in a town. 7

OR

10. a) Mention the most significant property of the city refuse which guides the adoption of each of the following methods of refuse disposal. 6
i) Incineration.
ii) Sanitary landfill.
iii) Composting.
b) What is composting? Explain the factors affecting composting. 7
11. a) Distinguish between the following : 6
i) Primary and secondary air pollutants.
ii) Stationary and mobile sources of air pollutants.
b) What are the harmful effects of polluted air on human beings? 7

OR

12. a) What is meant by Environmental Audit? 3
b) What is meant by EIA? What are its objectives? 4
c) Define air pollution. What are the objectives of using air pollution control equipment. 6
