

B.E. DEGREE EXAMINATIONS: APRIL / MAY 2010

SIXTH SEMESTER

CIVIL ENGINEERING

U07CE601: Environmental Engineering II

Time : Three Hours

Maximum Marks :100

Answer ALL Questions

PART A (10 x 1 = 10 Marks)

1. The discharge (by Manning's formula) through a stoneware sewer of 30cm diameter laid at a gradient of 1 in 100 with rugosity coefficient 0.013 is
 - a) 0.0967cumecs
 - b) 0.0941cumecs
 - c) 0.0867cumecs
 - d) 0.0734cumecs
2. A sewer manhole is located
 - a) At changes in pipe composition, grade, direction, & intersection
 - b) changes in alignment, diameter, grade, direction, & intersection
 - c) the discretion of the engineer & public works director
 - d) where a sewer clean out is not feasible
3. Facultative Bacteria require ----- in the water for their metabolism
 - a) Nitrogen
 - b) Hydrogen
 - c) Oxygen
 - d) Either aerobic or anaerobic conditions
4. In the activated sludge process, 'Sludge Bulking' occurs due to
 - a) low density sludge
 - b) high density sludge
 - c) low detention times
 - d) unexpected high BOD loading
5. In adsorption, the size of micropores is -----
 - a) greater than 25nm
 - b) less than 25nm
 - c) greater than 1nm
 - d) less than 1nm
6. Aerobic digestion is an ----- process whereby the aerobic bacteria consume themselves
 - a) endemic
 - b) endogenous
 - c) endothermic
 - d) endorphin
7. Processes that remove inorganic nutrients, such as phosphates are considered as
 - a) preliminary treatment
 - b) primary treatment
 - c) secondary treatment
 - d) tertiary treatment
8. The most common method of dewatering and drying sludge is
 - a) Belt press
 - b) Drying bed
 - c) Methane fired furnace
 - d) Hydraulic pressure press
9. The size of the soil pipe commonly used in house drainage is
 - a) 100mm
 - b) 75mm
 - c) 50mm
 - d) 30mm

10. The trap provided at the junction of house drain with the public sewer is
a) Gully trap b) Nahni trap c) Grease trap d) Intercepting trap

PART B (10 x 2 = 20 Marks)

11. What do you understand by the terms 'self cleansing velocity' and 'limiting velocity' in sewers?
12. Mention the advantages of circular sewer section?
13. Define BOD. What are the limitations of BOD test?
14. Differentiate suspended growth process from attached growth process.
15. What is the need for advanced wastewater treatment?
16. Name four advanced treatment processes.
17. Define eutrophication.
18. State the objectives of sludge dewatering?
19. What do you understand by 'house drainage'?
20. What is meant by anti-siphonage pipe?

PART C (5 x 14 = 70 Marks)

21. a) (i) Compare conservancy system and water carriage system. (7)
(ii) Write short notes on testing of sewers. (7)

(OR)

- b) (i) Discuss the merits and demerits of separate system of sewage. List the factors governing the choice of the system. (7)
(ii) With a neat sketch, explain the working of a pneumatic ejector. (7)

22. a) With a neat sketch, explain the biological process involved in the working of a trickling filter. State the advantages of a conventional trickling filter.

(OR)

- b) Describe with a neat sketch, the treatment of sewage by activated sludge process. Mention the advantages.

23. a) (i) Explain the USAB process. (7)
(ii) Discuss the principal mechanisms of removal of material within a granular medium depth filtration. (7)

OR

- b) (i) Discuss in detail the anaerobic sequencing batch reactors. (7)
(ii) Write short notes on adsorption isotherms (7)

24. a) Explain the process of anaerobic digestion of sludge with a schematic diagram. State the factors influencing the process.

(OR)

b) Explain in brief, the various methods of processing sludge.

25. a) With the help of diagrams, explain the various systems of plumbing used in house drainage.

(OR)

b) What are the characteristics of traps? Explain the various types of traps with neat sketches.