Reg. No. | | | | | | | | | | | | |

Question Paper Code : 80220

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Sixth Semester

Civil Engineering

CE 6605 – ENVIRONMENTAL ENGINEERING II

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Explain the meaning and significance of time of concentration?
2. What are the typical characteristics of sewage from South Indian cities?
3. Define Bore hole system.
4. Write the objective of screen chamber.
5. Define Hydraulic subsidence value?
6. What is on site sanitation?
7. List out the different methods of aeration in ASP?
8. What is Sewage sickness?
9. What is meant by ripened sludge?
10. Define the treatment 'sludge conditioning'.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Define the terms BOD and COD? Differentiate between first stage BOD and second stage. (8)

(ii) The BOD of a sewage incubated for one day at 30°C has been found to be 100 mg/L what will be the 5 day 20°C BOD. Assume BOD rate constant K' = 0.21 d^{-1} at 20°C (base e). (8)

Or

(b) (i) Explain briefly about Effluent standards. (8)

(ii) Explain the factors influencing DWF. (8)

12. (a) (i) Explain the method of laying sewer line for the designed/desired alignment and gradient. (9)

(ii) Determine the diameter of a sewer (n = 0.013) carrying 0.0125 m^3/s of peak sewage flow at half full depth. Take slope as 1 in 400. (7)

Or

(b) (i) List the sewer appurtenances commonly used? Explain any two with neat sketches? (10)

(ii) List out the problems taken place during he Pumping of sewage. (6)

13. (a) (i) Explain briefly the operation and maintenance of Sewage Treatment Plants. (8)

(ii) Design a primary clarifier of full scale STP with ASP for an average sewage flow of 12 Mld. Assume suitable data if necessary. (8)

Or

(b) Explain with neat sketch component parts, functioning advantages and disadvantages of septic tank. Also discuss various methods of disposal of septic tank effluent. (16)

14. (a) With neat flow Diagram explain ASP in treating wastewater. Discuss the various Design Parameter involved in it. (16)

Or

(b) Determine the size of a high rate TF for the follwoing data. (16)

Sewage flow = 6 mld

Recirculation ratio = 1.5

BOD of Raw Sewage = 230 mg/L

BOD removel in PST = 30 %

Final BOD effluent = 20 mg/L

15. (a) (i) Describe the anaerobic sludge digestion process and explain the effects of pH and Temperature on it. (10)

(ii) Explain about Bio gas Recovery? (6)

Or

(b) A town discharges 14 million litres per day sewage at a temperature of 23°C into a river having flow of 1.7 m^3/s and water temperature of 20° C BOD_5 at 20°c for the wastewater is 160 mg/L and K(base 10) is 0.1 per day, If R is 0.2 per day what is the critical oxygen deficit and the distance at which it occurs. Assume the stream as 92% saturated with oxygen before the sewage addition the solubility of oxygen at 20°C as 9.0 mg/L and river flow velocity as 0.12 m/sec. (16)
