Seventh Semester B.E. Degree Examination, Dec.2016/Jan.2017
Environmental Engineering – II

Time: 3 hrs.   Max. Marks:100

Note: 1. *Answer FIVE full questions, selecting*
at least TWO questions from each part.
2. *Assume missing data suitably.*

PART – A

1 a. Explain the different types of sewerage systems with their merits, demerits and suitability.
           (08 Marks)
    b. Explain the factors affecting dry weather flow.   **(06 Marks)**
    c. A certain district of a city has a projected population of 50,000 residing over an area of 40 hectares. Find the desired discharge for the sewerline for the following data:
      i) Rate of water supply = 200 lit per capita per day.
      ii) Average impermeability coefficient for the entire area = 0.3
      iii) Time of concentration = 50 minutes.
      A sewerline is to be designed for a flow equivalent to the wet weather flow plus twice the DWF. Use U.S. ministry of health formulae. Assume that 75% of water supply reaches in sewer as wastewater.   **(06 Marks)**

2 a. Briefly explain self cleansing velocity and non scouring velocity with their values. **(06 Marks)**
    b. Explain the desirable characteristics of a sewer material. List the sewer materials commonly used.   **(08 Marks)**
    c. A stoneware sewer 30 cm in diameter is laid at a gradient of 1 in 100 using N = 0.013 in Manning's formulae, calculate the velocity, discharge and Chagy's coefficient when the sewer is running full.   **(06 Marks)**

3 a. Explain with a neat sketch, working of a deep manhole.   **(08 Marks)**
    b. Write the basic principles of home drainage systems.   **(06 Marks)**
    c. Write a note on sewer ventilation and cleaning of sewers.   **(06 Marks)**

4 a. Explain different types of sampling.   **(06 Marks)**
    b. Write a note on nitrogen cycle.   **(06 Marks)**
    c. Define BOD and COD. Determine ultimate BOD for a sewage having 5-day BOD at 20°C as 160 mg/l. Assume deoxygenation content as 0.2 per day.   **(08 Marks)**

PART – B

5 a. Briefly explain factors affecting self purification process.   **(08 Marks)**
    b. Explain with a neat sketch, the salient features of oxygen sag curve.   **(06 Marks)**
    c. Write short notes on:
      (i) Sewage sickness   (ii) Sewage farming.   **(06 Marks)**

6 a. Explain with a flow diagram, a conventional sewage treatment plant. Discuss the function of each component.   **(08 Marks)**
    b. Explain different types of screen.   **(06 Marks)**
    c. Design a primary settling tank of rectangular shape for a town having a population of 50,000 with a watersupply of 180 litres per capita per day.   **(06 Marks)**

7   a.   With the help of a neat sketch, explain the working of trickling filter.   **(10 Marks)**

      b.   Mention the modification of activated sludge process. Explain any two of them.   **(10 Marks)**

8   a.   With the help of neat sketch, explain working of sludge drying beds.   **(10 Marks)**

      b.   Write short notes on:
  i) Mechanism of anaerobic sludge digestion.
  ii) Oxidation ditches.   **(10 Marks)**

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