VASAVI COLLEGE OF ENGINEERING (*Autonomous*), HYDERABAD
B.E. (Civil Engg.) III Year I-Semester (Main) Examinations, Nov./Dec.-2016
Environmental Engineering

Time: 3 hours

Max. Marks: **70**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

1. What is the role of protected water supply in sanitation?
2. Write a brief note on BIS-10500.
3. Explain various methods to address the problem of taste and odour in water.
4. What is break point chlorination? Explain its significance.
5. Differentiate Sewage, Sewer and Sewerage.
6. Explain the Rational method for estimation of Storm water.
7. Enumerate the need for Waste Water Treatment.
8. Determine the settling velocity of a grit particle of 0.15mm diameter. Given - Temperature of the waste water as 25^0C, the density of the particle is 2.65 grams/cc. Also determine the surface loading rate in $m^3/day/m^2$.
9. Explain the function of RBC with neat sketch.
10. Name different components in Municipal solid waste and explain each one of them.

Part-B (5 × 10 = 50 Marks)

11. a) Mention important components of Water supply and Sewerage project and state their importance. [5]

    b) Discuss the factors that affect water consumption. [5]

12. a) Draw the diagram of Rapid sand filters (including pretreatment) and discuss. [4]

    b) Design rapid sand filters to treat 22.5 mld of water. Draw the sketch for the design including under drainage system. Assume suitable data. [6]

13. a) Explain the methodology to determine the total quantity of sewage for the design of sewerage system. [5]

    b) Estimate the design peak flow in m^3/sec for an area of $3km^2$ with density of population 300/hectare. Assume per capita water supply as 150 litres and sewage contribution as 75% of water supply. [5]

14. a) What is biological treatment? Explain its principles. [5]

    b) With neat sketch enumerate the principles of Trickling Filters. Draw the flow diagram for low rate and high rate Trickling Filters. [5]

15. a) Define Municipal solid waste (MSW). Mention different steps in MSW management and discuss. [4]

    b) Design a septic tank with the following data: [6]
       No of people: 200
       No of people per household: 5
       No of closets in each house: 2
       Simultaneous discharge from closets: 70%
       Maximum Discharge: 9 lpm. from each closet
       Surface area required: 0.92m2/10 lpm.
       Assume any missing data suitably. Draw the sketch.

16. a) Define the terms health and sanitation. Mention three water borne diseases. Explain the role of water in protecting the health of the people. [6]

   b) The DO of sewage sample with 10% dilution is 5mg/l on first day and 0.5mg/l after five days of incubation. Determine the BOD of the sample. [4]

17. Write short notes on any *two* of the following:

   a) Sludge Digestion Tank [5]

   b) The role of secondary clarifier in Activated Sludge Process [5]

   c) BOD and COD. [5]

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