

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech. Winter 2019-20 Examination

Semester: 5
Subject Code: 03104301
Subject Name: Environmental Engineering - I

Date: 07/12/2019
Time: 10:30 am to 1:00 pm
Total Marks: 60

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Objective type questions (Each carries one mark)

(15)

1. The process of passing water through sand and gravel bed is called _____.
2. The most commonly used disinfectant in our country is _____.
3. The solid waste generated from discarded electronics goods is known as _____.
4. The microorganisms responsible for water borne disease are called _____.
5. The technique used for storing the rain water at surface or below ground level is called _____.
6. The solid waste generated at home or residential premises is termed as _____
a. Domestic waste b. Commercial waste c. Industrial waste d. E-Waste
7. _____ are underground source of water.
a. Wells b. Rivers c. Storage reservoirs d. None of these.
8. Unit of surface loading rate for a sedimentation tank is
a. m^3/day b. $m^3/m^2/day$ c. $m^3/m/day$ d. m^3/sec
9. The recommended pH range for treated drinking water is
a. 4 to 6 b. 6.5 to 8.5 c. 10 to 12 d. none of these
10. Most commonly used treatment method of solid waste is
a. Incineration b. Landfilling c. Pyrolysis d. Composting
11. Which is the most commonly used coagulant in conventional water treatment plant?
12. What is the name of process for killing micro-organisms?
13. Which apparatus is used in laboratory to determine optimum dose of coagulant?
14. Which type of hardness can be removed by boiling?
15. What is the unit of turbidity?

Q.2 Answer the following questions. (Attempt any three)

(15)

- A) Explain various methods of rainwater harvesting and discuss the importance of rain water harvesting.
- B) Explain the process used for finding optimum coagulant dose in laboratory.
- C) Explain the factors affecting solid waste generation.

D) Explain working of a rapid sand filter with the help of a neat sketch.

Q.3 A) Discuss various methods of solid waste collection. (07)

B) Enlist the various factors that affect selection of pump. A city with 1.5 lakh population is to be supplied water at 100 lpcd from a river 1 km away. The difference in water level of sump and reservoir is 25 m. If the demand has to be supplied in 8 hr., determine the size of the main and B.H.P of the pumps required. Assume $f= 0.0075$, velocity in the pipe = 2.0 m/sec and efficiency of pump = 75 % (08)

OR

B) Enlist the layout systems for water distribution networks & explain any one with neat sketch. (08)

Q.4 A) Explain flow diagram of a surface water treatment plant with the help of a neat sketch. (07)

OR

A) Explain the different types of settling in a sedimentation tank. For a flow of 27,000 m³/day, design a circular sedimentation tank, assuming suitable data. (07)

B) Enlist the chemical characteristics of water and discuss any two in detail. (08)