

Roll No. 

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (CE) (Sem.-7<sup>th</sup>/8<sup>th</sup>)**ENVIRONMENTAL ENGINEERING-II**

Subject Code : CE-406

Paper ID : [A0626]

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTION TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.
- SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.

**SECTION-A****1. Answer briefly :**

- Differentiate between separate system of sewerage and combined system of sewerage.
- What is meant by 'self cleansing velocity and limiting velocity' in sewers?
- The pipes are laid with their socket end at the upper end. Why?
- What is meant by 'water seal' in a sanitary fixture?
- Why is ventilation of sewer important?
- Why oil/grease is considered as important characteristics of sewage?
- What are anti-syphonage pipes? Why are they used?
- List any four objectives of sludge digestion.
- What is meant by relative stability?
- What is meant by Sewage Sickness?

**SECTION-B**

- A sewer has to be designed for a colony of 30 ha with population density is 150 persons/ha. The average water supply is 220 lpcd, The available ground slope is 1 in 500. Assume the sewer is to run half full for peak discharge. What is the design flow and diameter of the sewer? Also calculate the self-cleansing velocity.

- What are inverted siphons? Where are they used?
- Draw a general layout of a sewerage system showing (i) branch sewer (ii) Main sewer (iii) outfall sewer.
- Describe the methods for testing straight run of sewer.
- Design a rectangular grit chamber from the following data:  
Flow of sewage - 5 MLD  
Sp gr of the grit 2.75  
Size of grit to be removed - 0.25 mm  
Viscosity of wastewater  $1.1 \times 10^{-2}$  cm<sup>2</sup>/s

**SECTION-C**

- (a) Design an ASP with the following data:  
Population - 1 lakh  
Sewage flow - 150 lpcd  
BOD of raw sewage - 170mg/L  
SS of in raw sewage - 250 mg/L  
BOD removal in primary treatment - 35%  
Overall BOD removal desired - 90%  
(b) What is meant by sludge volume index? How is it useful in sewage treatment plants?
- What is meant by strength of sewage? How is it determined? test and consider COD and ThOD as alternative tests.
- (a) With the help of neat sketch explain the difference between one pipe system and two pipe system.  
(b) Explain the various tests to be conducted for the tightness of drainage pipes.