

Roll No.

24381

B. Tech. (Civil) 6th Semester

Examination – May, 2015

SEWERAGE & SEWAGE TREATMENT

Paper : CE-308-F

Time : Three Hours]

[Maximum Marks : 100

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : (i) Question No. 1 is *compulsory*.

(ii) Each question carries equal mark. (20 marks).

(iii) Students have to attempt 5 questions in total at least one question from each section.

(iv) Use of IS 456-2000 is allowed.

(v) Assume suitable data if missing.


1. Write short notes on the following : $10 \times 2 = 20$

(i) Combined and Separate system of drainage.

(ii) Catch pits.

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- (iii) Manhole and drop manhole
 - (iv) One pipe system of plumbing
 - (v) Intercepting tanks
 - (vi) BOD/ COD ratio
 - (vii) Grit removal unit
 - (viii) Oxidation ditches
 - (ix) Effect of noise
 - (x) Air pollution controls

SECTION – A

2. (a) What are the different kinds of pipes used in sewerage works ? Compare their advantage and disadvantages. Find out the velocity and discharge of a stoneware pipe flowing full of 0.5m diameter laid in a gradient of 1 : 300. 10
- (b) What precaution would you take in the design and construction of sewers so that their maintenance would be simple and easy ? 10
3. (a) Why it is necessary to provide 'ventilation' of the house drain ? 10
- (b) Differentiate between single pipe and single stack plumbing system. 10

SECTION – B

4. (a) The sewage discharge of a city is $85\text{m}^3/\text{sec}$ in the river having a minimum discharge of $9301/\text{sec}$ with a velocity of $0.12\text{m}/\text{sec}$. The B.O.D. at 20°C of the sewage is $325\text{mg}/\text{l}$. The B.O.D. of the river is zero. Determine the quantity and point of critical deficit. 10
- (b) What is sewage farming ? What are their advantages over the method of disposal of sewage by dilution? What crop should be grown on such farms ? 10
5. (a) There is sewage sludge with volume containing certain moisture content $p_1\%$. What will be the volume of this sludge if its moisture content is reduced to $p/2\%$. 10
- (b) What are the factors effecting sludge digestion ? Discuss their control also. 10

SECTION – C

6. With the aid of sketches, describe the principles involved in the design and construction of the following : 20
- (a) Grit chamber
- (b) Percolating filter

7. Design an Imhoff tank to treat the sewage from a small town with 30,000 population, assuming that the suspended solids in the influent sewage are 200ppm. Water content of sludge is 97%. Design the tank for three month sludge storage. Rate of sewage is 137litre per head per day. 20

SECTION – D

8. (a) Explain in brief the major factors and actions that may help in noise abatement in a modern society. 10
- (b) Differentiate between continuous noise, intermittent noise, and impulse noise. 10
9. What is the effect of air pollution in the environment ? How to disperse the air pollution in the environment ? Explain. 20
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