

Roll No .....

**CE - 7103**

**B.E. VII Semester**

Examination, December 2015

**Industrial Waste Treatment**

*Time : Three Hours*

*Maximum Marks : 70*

- Note:** i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.  
ii) All parts of each question are to be attempted at one place.  
iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.  
iv) Except numericals, Derivation, Design and Drawing etc.

1. a) As per Indian standards, what is permissible organic loading on streams?  
b) What do you understand by dry weather flow? Discuss in brief various factors affecting dry weather flow.  
c) How “Stream standards” are better than “Effluent standards”?  
d) Explain oxygen sag curve, Deoxygenation and Deoxygenation curves with the help of neat diagram.

OR

A city discharges 20,000 m<sup>3</sup>/day of sewage into a river whose rate of flow is 0.7 m<sup>3</sup>/sec. Determine critical D.O. deficit from the following data.

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[2]

River	Sewage Effluent from ETP
BOD <sub>5</sub> at 20°C = 3.4 mg/L	BOD <sub>5</sub> at 20°C = 45 mg/L
Temperature = 23°C	Temperature = 26°C
D.O. = 8.2 mg/L	D.O. = 2.0 mg/L

Velocity of mix = 0.25 m/sec.

$K_R = 0.4/\text{day}$  and  $K_D = 0.23/\text{day}$

D.O.<sub>Sat</sub> at 23.74°C = 8.5.7 mg/L.

2. a) Enlist different characteristics of industrial waste water, generally monitored.
- b) Explain COD to BOD ratio. How it differs from industry to industry.
- c) Describe "Recovery of by products".
- d) Explain different methods of Neutralization in Industrial waste treatment.

OR

Describe the method of "Equalization and Proportioning" for industrial waste treatment.

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3. a) What is meant by "Algal Harvesting"? Why it is practiced?
- b) Explain reuse and recycling concept in waste water management.
- c) Explain process of "Adsorption". Give its types.
- d) How ion exchange process is used in industrial waste treatment? Give example and working of ion-exchanger.

OR

Explain the principle and method involved in "Reverse Osmosis" process used for industrial waste treatment.

[3]

4. a) Enlist the instruments used in waste water treatment plant.
- b) Explain "Sewer Rental Charges".
- c) How required energy is optimised for running common effluent treatment plant?
- d) Explain in detail procedure and safety to be taken while operating waste water treatment plant.

OR

Give the guidelines given by CPCB (Central Pollution Control Board) for treatment and disposal of industrial waste water.

5. a) Write major characteristics of "Paper and Pulp" industry waste water.
- b) Compare COD to BOD ratio of waste water from "Tannery" and "Distillery".
- c) Draw the flow diagram for waste water treatment process of "Paper and Pulp" industry.
- d) Define "Hazardous waste". How its toxicity is measured? Enlist safety measures required during handling and disposal.

OR

Write in detail characteristics of Textile industry waste water and draw flow diagram for its waste water treatment process.

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