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RN-7343

B. E. - IV (Sem. VII) (Civil) Examination

May / June – 2010

Environmental Engg. - II

Time : **3** Hours] [Total Marks : **100**

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **B. E. - 4 (Sem. 7) (Civil)**

Name of the Subject :

☛ **Environmental Engg. - 2**

☛ Subject Code No. : **7 3 4 3** ☛ Section No. (1, 2,.....) : **1&2**

Seat No. :

Student's Signature

(2) Answer to the **two** sections must be written in **separate** answer book.

(3) Assume necessary data if required.

(4) Figures to the right indicate full marks.

(5) Attempt **all** questions.

(6) Draw neat sketch, whenever necessary.

SECTION - I

1 (a) Explain the following terms : (any **five**) **10**

(i) Unit operations

(ii) Ion exchange

(iii) Aerobic process

(iv) Conditioning

(v) Coagulant

(vi) B.O.D.

(vii) Detention time.

(b) Design a rectangular tank for a city having population 1,20,000. Waste water generation is 80% of total water supply. **7**

2 (a) Discuss in brief any two types of settling tank with neat sketch. 8

OR

(a) Prove that in rectangular continuous flow type tank basin efficiency is solely a function of settling velocity and surface area of particle.

(b) Explain in brief various methods used for 'aeration' in the activated sludge process. 7

OR

(b) Discuss the point of comparison for conventional filter and high rate filter in tabular form.

3 (a) The sewage flows from PST to standard rate including filter at a rate of 5 MLD having 5 day BOD of 135 Mg/l. Determine depth and volume of filter, adopting a surface loading rate 2000 $l/m^2/day$ and organic loading of 150 $g/m^3/day$. 8

(b) Write short notes : (any **two**) 10

(i) Screens and Racks

(ii) Intermittent filter

(iii) Oxidation ditch

(iv) Attached growth process.

SECTION - II

4 (a) Answer in one sentence or so : 8

(i) Define Garbage and Rubbish.

(ii) State disposal standard limits for discharge of BOD and COD into river.

(iii) Give full form of TOC.

(iv) Name method used for measurement of D.O.

(v) Name the gases responsible for Green House Effect.

(vi) What is sewage farming?

(vii) What is meant by anaerobic bacteria?

(viii) What is Aerosol?

(b) Enlist physical and chemical characteristics of waste water. Discuss significance of : **7**

(i) Oil and Grease

(ii) Dissolved oxygen.

5 (a) Discuss zones of pollution in the stream. **7**

(b) Attempt any **two** : **10**

(i) If the 3 days 25°C BOD of a sample of sewage is 250 mg/lit. What will be its 5 days 30°C BOD? Take θ = 1.047 and K_{20} = 0.1.

(ii) If the per capita contribution of suspended solids and BOD is 100 gm and 60 gm, find the population equivalents of

(a) A combined system serving 10,000 persons and having 80 gm of per capita daily BOD and

(b) 250000 litres daily of industrial waste water containing 1400 mg/lit of suspended solids.

(iii) The two days BOD of a waste has been measured as 250 mg/lit. If the rate constant K^1 = 0.26/day (base e), what is the ultimate BOD of the waste? What proportion of BOD_u (Ultimate BOD) would remain unoxidised after 10 days?

6 Write short notes on any **three** : **18**

(i) Disposal by dilution

(ii) Land pollution

(iii) Solid waste disposal by composting

(iv) Nitrogen cycle

(v) Uses and limitations of BOD test.