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320613(20)

B. E. (Sixth Semester) Examination, April-May 2020

(New Scheme)

(Civil Engg. Branch)

ENVIRONMENTAL ENGINEERING-I

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : *Attempt all questions Part (a) of all question is compulsory and carries 2 marks. Attempt any two parts from rest. Each part carries 7 marks. Draw neat sketches wherever required.*

1. (a) What is LPCD?

(b) Explain with neat sketch logistic curve method.

(c) Following data have been noted from census department.

Year	Population
1940	8000
1950	12000
1960	17000
1970	22500

Calculate the probable population in the year 1980, 1990.

(d) Explain with neat sketch river intake well.

2. (a) What is blue baby disease?

(b) What is turbidity? Explain any two methods of turbidity.

(c) Waterworks of a town treat 35×10^6 liters/day. The water is treated by coagulation-sedimentation tanks. The quantity of filter alum is consumed at 20 mg/l of water. If the alkalinity of the raw water is equivalent to 4.5 mg/l of $CaCO_3$, determine the quantitiy of filter alum and the quick lime (containing 80% of

CaO) required per month by the water works. Molecular weights are given as (Ca = 40, C = 12, S = 32, O = 16, Al = 27 and H = 1).

(d) Describe the Jar test with neat sketch for determining coagulant dosage.

3. (a) What is break point chlorination?

(b) Explain operational troubles in rapid sand filter.

(c) Design five slow sand filter beds from following data for the water works of town of population 75,000 per capita demand = 135 LPCD. Rate of filteration = 210 liters/hr/m^2. Assume data if required. Average demand out of five units, one is to be kept as stand by and used while repairing other units.

(d) Explain chlorine chemistry with neat sketch of break point chlorination.

4. (a) Which one of the following tests of water employs Erichrome Black T as an indicator :

(i) Hardness

(ii) Residual chlorine

(iii) COD

(iv) Total solids

(b) Enlist requirements of Good Distribution System.

(c) Compare merits and demerits of Ion exchange with zeolite process.

(d) Explain with neat sketch zeolite process of water softening.

5. (a) Which of these are secondary pollutants?

(i) CO_2

(ii) NO_2

(iii) Hydrocarbons

(iv) O_3

(b) Describe the electronic precipitator and bag filter for particulate matter control with neat sketch.

(c) Describe the effects of air pollution on human.

(d) Classify different type of air pollution.