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Pages: 2

Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Seventh Semester B.Tech Degree Supplementary Examination August 2021

Course Code: CE405

Course Name: ENVIRONMENTAL ENGINEERING- I

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks. Marks

1 a) What is the necessity of a planned water supply scheme in the present day life? (6)

b) Differentiate continuous and intermittent system of water supply. What are their relative advantages and disadvantages? (6)

c) What is coincident draft? (3)

2 a) What are the drinking water standards of pH, iron, chloride, nitrate and MPN? (5)

b) What are intakes? Explain dry intake tower and wet intake tower with sketch. (10)

3 a) Explain the population forecasting by logistic curve method. (6)

b) The population of a locality as obtained from census report is as follows. (5)

Year	1971	1981	1991	2001	2011
Population	45,000	58,000	67,000	76,000	80,000

Predict the population of the locality in the year 2051 by decreasing rate of growth method.

c) What are various sub-surface sources. (4)

PART B

Answer any two full questions, each carries 15 marks.

4 a) Explain air binding in filters. What are its remedial measures? (6)

b) List any three advantages of pressure filters. (3)

c) Differentiate slow sand gravity filter and rapid sand gravity filter with respect to any six points. (6)

5 a) Write the equation for finding out the settling velocity for small spherical particles under laminar flow. Find the settling velocity of a discrete particle of 0.03mm diameter and specific gravity 2.60 under laminar flow conditions. Kinematic viscosity of water 0.0102 cm^2/sec. (4)

b) A filter unit is 5.2m long and 3.4m wide. After filtering 9000 m^3/day in 24 hour period, the filter is backwashed at the rate 12 litres/m^2/sec for 15 minutes. Compute the rate of filtration, percentage of treated water used in backwashing and the rate of wash water flow in each trough, assuming 4 troughs. (8)

c) What is clariflocculator. (3)

6 a) Explain the principle behind coagulation. List any two coagulants. (5)

b) Determine the quantity of Aluminium hydroxide floc formed per litre of water treated when 10 million litres of water per day is treated with alum dosage of 13 mg/l. Also determine the amount of alum required per day. (6)

c) Explain the design concepts in an upflow clarifier. (4)

PART C

Answer any two full questions, each carries 20 marks.

7 a) What is defluoridation? Why is it required? (5)

b) Explain any three methods of aeration. (9)

c) Explain break point chlorination. (6)

8 a) Explain the procedure to be adopted in Hardy Cross method for the analysis of pipe networks. (6)

b) A pipe network consists of four pipes, namely AB, BC, CD and DC with K values 2, 2, 1 and 3 respectively. Inflow at A is 1.0 m^3/sec, while outflows at B, C and D are 0.3, 0.5 and 0.2 m^3/sec, respectively. The head loss, H_L, may be assumed as KQ^n. The flow is turbulent and pipes are rough. Determine the distribution of flow in the pipe network, taking only two trials. (14)

9 a) What is the procedure to fix the sizes of pipes of a simple distribution system? (6)

b) Total chlorine required to treat 18,000 m^3/day of water is 10 kg/day. The residual after 10 minutes contact is 0.2 mg/l. Compute chlorine demand of water. (6)

c) Explain how lime soda process help in the purification of water. (5)

d) Differentiate free available chlorine and combined residual chlorine. (3)

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