JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATIONS- 2023

B.Tech-III Semester (CE)

COURSE CODE (CREDITS): 18B11CE314 (3)

MAX. MARKS: 35

COURSE NAME: Water Supply Engineering

COURSE INSTRUCTORS: Dr. Rishi Rana Kalia

MAX. TIME: 2 Hours

Note: (a) All questions are compulsory.

(b)Marks are indicated against each question in square brackets.

(c) The candidate is allowed to make Suitable numeric assumptions wherever required for

solving problems

Q.1 Briefly explain the term "water demand". What are the various factors which affect the water demand? With neat mathematical expressions, explain how the water demand calculated in terms of lpcd? **[3 Marks]** (CO-1)

Q.2 (a) With a neat sketch, briefly explain the process of break point chlorination in water?

[4 Marks] (CO-5)

(b) The following data is taken from census; compute the next 4 decades population using arithmetic, geometric and decrease method? **[4.5 Marks]** (CO-2)

Year	Population
1971	84000
1981	125000
1991	180000
2001	240598
2011	359674

Q.3 (a) In a water treatment plant, the pH values of incoming and outgoing waters are 10.7 and 6.5 respectively. Assume a linear variation with time; determine the average pH value of water.

[2 Marks] (CO-2)

(b) A rectangular settling tank without mechanical equipment is to treat 1.8 million litres per day of raw water. The sedimentation period is tobe 4 hours, the velocity of flow 8 cm/minute, and the depth of the water and sediment 4.2 m. if an allowance of 1.2 m for sediment is made, what should be the length and width of the basin? **[3 Marks]** (CO-4)

Q.4 (a) Give a comparison of slow sand and rapid sand filters? **[5 Marks]** (CO-3&4)

(b) Chlorine usage in the treatment of 20,000 cubic meters per day is 8 kg/ day. The residual after 10 minute contact is 0.20 mg/l. calculate the dosage in milligrams per liters and chlorine demand of the water? **[2.5 Mark]** (CO-5)

Q.5 (a) Explain the hardy cross method used for pipes network analysis in water distribution system? **[3 Marks]** (CO-5)

(b) Write in detail about the various processes of chlorination of water? **[2 Marks]** (CO-4&5)

Q.6 Design the approximate dimensions of a set of rapid gravity filters for treating water required for a population of 50,000; the rate of supply being 180 litres per day per person. The filters are rated to work 5000 litres per hour per sq m. assume whatever data are necessary.

[3 Marks] (CO-3)

Q.7 What are the common impurities found in natural sources of water, and explain their effects upon its quality? **[3 Marks]** (CO-2&3)