



JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

EndTerm Examination (Regular), April-May2015

B. Tech in Civil Engineering, Semester IV

Roll No.....

CE407: ENVIRONMENTAL ENGINEERING-I

Time: 3 hours

Max. Marks: 100

Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.

Q.1A Objective type multiple choice questions (10 questions @ 1 mark)

10

- i. Design period for water distribution system:
(a) 50 years
(b) 15 years
(c) 30 years
(d) 100 years
- ii. C.I. Pipes cannot be used for pressure greater than :
(a) 9 Kg/ Cm²
(b) 7 Kg/ Cm²
(c) 5 Kg/ Cm²
(d) 10 Kg/ Cm²
- iii. In which population forecast method the percentage increase in population from decade to decade is constant :
(a) Arithmetical increase method
(b) Incremental increase method
(c) Geometrical increase method
(d) Decrease rate of growth method
- iv. According to EPA's standard the concentration of coliform organism in water should be less than or equal to :
(a) 1 coliform organism per 100 ml
(b) 10 coliform organism per 100 ml
(c) 100 coliform organism per 100 ml
(d) 1000 coliform organism per 100 ml
- v. Turbidity of raw water is a measure of:
(a) Suspended Solids
(b) Acidity of Water
(c) B.O.D.
(d) None of these

vi	According to Indian Standard (IS:458-1961), the unreinforced concrete , heavy duty, non-pressure pipe belongs to class : (a) NP 2 (b) NP 3 (c) NP 1 (d) P 2
vii.	Identify the true statement : In order to obtain variable discharge at maximum efficiency by multiple pump system : (a) variation of speed with belts and pulley (b)) variation of speed with a variable speed motor (c) Provision of several pumps of smaller capacity in parallel (d) All are correct (c) All are incorrect
viii.	As per IS : 1172-1963, water required per head per day for average domestic purposes, is (a) 50 litres (b) 65 litres (c) 85 litres (d) 105 litres (e) 135 litres
ix.	Distribution mains (Generally for population over 50,000) of any water supply, is normally designed for its average daily requirement: (a)100% (b)150% (c)200% (d)225%
x.	Water distribution system suitable for cities with rectangular type layout : (a) Tree system (b) Ring system (c) Radial system (d) Grid iron system

Q.2	Short answer type questions (4 questions @ 2.5 marks) Write short note on the following: i. C.I. Pipes ii. Cement concrete pipes iii. Displacement pumps iv. Air lift pump	10
Q.3A	How will you prevent the precipitation of supersaturated solution of calcium carbonate and its subsequent deposition in water lines and storage facilities?	05
Q.3B	Explain the various theories of coagulation.	05



Q.4A	Differentiate between the following : i. Slow Sand filter ii. Rapid Sand filter	05
Q.4B	Write short note on the following : i. Trickling filter ii. RBC	05
Q.5A	Explain various method of De-fluoridation of water.	05
Q.5B	Write Brief note on the following : i. Turbidity of Water ii. Color of water	05
Q.6A	Write the various steps in designing a water distribution system.	05
Q.6B	Derive the Stokes Equation during settling process of discrete particles in dilute suspension.	05
OR		
Q.6B	Find the terminal settling velocity of a spherical particle with diameter 0.5 mm and specific gravity of 2.65 settling through water at 200 C. Given : Density of water = 998.2 kg/ m ³ Dynamic viscosity of the water = 1.002 x 10 ⁻³ N.s/m ² at 200 C.	05
Q.7A	Explain the "Break Point Chlorination" with the help of suitable generalized curve.	05
Q.7B	Explain the various units of a public water supply system.	05
OR		
Q.7B	Write the " Water Quality Criteria " prescribed by Central Pollution Control Board(CPCB) as per following headings : i. Designated-Best-Use ii. Class of water iii. Criteria	05
Q.8A	Explain the various "Water distribution Systems".	10
Q.9A	Explain in detail the following methods of population forecasting: i. Arithmetical increase method ii. Uniform percentage growth method iii. Incremental increase method iv. Graphical extension method	10
Q.9B	Explain the different "Multiple Pump System" in order to achieve variable discharge at maximum efficiency.	10
OR		
Q.9B	Explain in detail the process flow of conventional domestic Sewage Treatment Plant (STP).	10