

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Backlog), Nov.-Dec. 2015

B. Tech in Civil Engineering, Semester V

Roll No.....

CE505: ENVIRONMENTAL ENGINEERING

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.	The National Green Tribunal (NGT) has been established in: (a) 2009 (b) 2000 (c) 2010 (d) 2013	
ii.	C.I. Pipes cannot be used for pressure greater than : (a) 9 Kg/ Cm ² (b) 7 Kg/ Cm ² (c) 5 Kg/ Cm ² (d) 10 Kg/ Cm ²	
iii.	In Activated Sludge Process(ASP) , the biochemical decomposition of organic matter known as : (a) Primary treatment (b) Secondary treatment (c) Tertiary treatment (d) None of these	
iv.	Unit of color measurement: (a) TPU (b) TCU (c) J TU (d) NTU	
v.	Zeolite (Green Sand), a naturally occurring ion exchanger used for water softening process is : (a) Sodium magnesium silicate (b) Sodium alumino hydrate (c) Magnesium alumino silicate (d) Sodium almino silicate	

vi.	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	
vii.	A mat of biological organism was not allowed to develop at water sand interface in : (a) Slow sand filter (b) Rapid sand filter (c) Trickling filter (d) HEPA filter	
viii.	Up flow Anaerobic Sludge Blanket (UASB) reactor of waste water treatment system have : (a) Air diffusers (b) Mechanical aerators (c) No aerators (d) None of these	
ix	According to Indian Standard (IS:458-1961), the Reinforced concrete , heavy duty, non-pressure pipe belongs to class : (a) NP 2 (b) NP 3 (c) NP 1 (d) P 2	
x	Suspended- culture system of waste water treatment consist of : (a) Ponds and Lagoons (b) Rotating Biological Contactors (c) Both a & b are correct (d) Both a & b are incorrect	

Q.2	Short answer type questions (4 questions @ 2.5 marks)	10
	i. Explain the following term w.r.t. Desalination : a. Reverse osmosis (RO) b. Electro-dialysis	
	ii. Write short note on the following: a. Sewage b. Sewerage	

Q.3A	Explain the processes adopted for the reduction of hardness from the water.	05
Q.3B	What are the different types of pipe joints provided in C.I. pipes?	05
Q.4A	Explain the methods of nitrate removal from water.	05
Q.4B	Explain settling phenomenon of flocculating particles in dilute suspension.	05
Q.5A	Explain in detail, the various units of municipal or public water supply system.	05

Q.5B	Explain the "Breakpoint Chlorination" with the help of suitable generalized curve.	05
Q.6A	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 × 10 ⁻³ N.s/ m ² at 200 C.	05
Q.6B	Derive the Stokes Equation during settling process of discrete particles in dilute suspension.	05
OR		
Q.6B	Briefly describe the following pipes : i. Steel pipes ii. Cement Concrete pipe	05
Q.7A	If the fluoride concentration in water is found to be more than 1-1.5 ppm than what will be the possible measures that you will take for removal of fluoride from water?	05
Q.7B	Explain the "Breakpoint Chlorination" with the help of suitable generalized curve.	05
OR		
Q.7B	Write short note on the following: i. RBC ii. UASB	05
Q.8A	Write a brief note on scenario of "Water supply: Demand and source" in the state of Rajasthan.	10
Q.9A	Explain any two such reactor in detail those which are based on Attached-Culture Systems of waste water treatment.	10
Q.9B	Explain in detail the various theories of coagulation.	10
OR		
Q.9B	Explain in detail the process flow of conventional domestic Sewage Treatment Plant (STP).	10