



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad-500043

CIVIL ENGINEERING

TUTORIAL QUESTION BANK

Course Name	:	INDUSTRIAL WASTEWATER TREATMENT
Course Code	:	A70139-R15
Class	:	IV B.TECH I SEM
Branch	:	CIVIL ENGINEERING
Year	:	2018 – 2019
Course Coordinator	:	Mr. Ch. Balakrishna, Assistant Professor, Dept of CE
Course Faculty	:	Dr. J.S.R Prasad, Mr. Ch. Balakrishna, Assistant Professor, Dept of CE

OBJECTIVES

To meet the challenge of ensuring excellence in engineering education, the issue of quality needs to be addressed, debated and taken forward in a systematic manner. Accreditation is the principal means of quality assurance in higher education. The major emphasis of accreditation process is to measure the outcomes of the program that is being accredited. In line with this, Faculty of Institute of Aeronautical Engineering, Hyderabad has taken a lead in incorporating philosophy of outcome based education in the process of problem solving and career development. So, all students of the institute should understand the depth and approach of course to be taught through this question bank, which will enhance learner's learning process.

SNo	QUESTION	Blooms taxonomy level	Course Outcomes
UNIT - I			
Part - A(Short Answer Questions)			
1	Define wastewater.	Remember	2
2	Define wastewater treatment.	Remember	2
3	Write a short note on effluent and Influent of a Industry.	Understand	1
4	What are different sources of pollution?	Understand	2
5	Write the physical properties of Industrial Waste Water.	Understand	2
6	Write the Chemical properties of Industrial Waste Water	Remember	1
7	Write the Organic properties of Industrial Waste Water.	Remember	2
8	Write the Biological properties of Industrial Waste Water.	Remember	2
9	Write a short note on Domestic waste water.	Remember	2
10	Write a short note on Industrial waste water.	Remember	2
11	On what factors the selection of particular process for treating the effluent of Industrial Waste Water? Write three alternatives for the disposal of the industrial wastes.	Understand	2
12	What are the Characteristics of Industrial Wastes? Give short note on Inorganic Salts and Acids or Alkalies.	Remember	2

13	What are the Characteristics of Industrial Wastes? Give short note on organic Matter and Suspended Solids	Remember	2
14	Write a short note on Floating Solids and Liquids.	Remember	2
15	Give a note on Heated Water in view of Industrial waste.	Understand	2
16	What are the effects of industrial effluents on sewers?	Understand	2
17	What are the effects of industrial effluents on Natural water bodies?	Understand	2
18	Write short note on BOD and COD.	Understand	2
19	Write short note on Total organic carbon (TOC) and Theoretical oxygen (ThOD).	Understand	2
20	List the Steps involved in Primary treatment of waste water .	Understand	2

Part - B (Long Answer Questions)

1	Explain in detail about the different sources of Industrial waste waters.	Remember	1
2	Discuss in detail about the Physical properties of Industrial wastewater.	Understand	1
3	Discuss in detail about the Chemical properties of Industrial wastewater.	Understand	2
4	Discuss in detail about the Organic properties of Industrial wastewater.	Remember	2
5	Discuss in detail about the Biological properties of Industrial wastewater.	Understand	2
6	Explain the difference between Industrial and Municipal wastewaters.	Remember	2
7	Explain in detail the effects of Industrial effluents on sewers.	Understand	2
8	Explain in detail the effects of Industrial effluents on Natural water bodies.	Understand	1
9	Give the detailed information with respect to Waste water sources and its characteristics.	Understand	1
10	Give the detailed information with respect to manufacturing process.	Remember	1
11	Describe the following characteristics of waste water in detail of the following 1. pH, 2. Solids, 3. BOD, 4. COD, 5. Heavy Metals.	Understand	1
12	State the various types of benefits of water pollution control by doing treatment of industrial waste.	Understand	2
13	State the importance of Industrial waste treatment.	Understand	2
14	What are the factors affecting self purification of polluted streams? Give suggestions to control.	Understand	2
15	Explain briefly the methods of removal of suspended solids from industrial waste water.	Remember	2
16	Define Industrial waste water and explain how it is different from Domestic sewage?	Understand	2

UNIT - II

Part – A (Short Answer Questions)

1	List the different stages of waste water treatment.	Remember	2
2	Draw the neat sketch of different stages of wastewater treatment plant.	Remember	3
3	Write a short note on Pre-treatment of waste water treatment.	Understand	3
4	Write a short note on Primary-treatment of waste water treatment	Remember	3
5	Write the different ways involved in Strength Reduction of Industrial waste water	Remember	3
6	Write a short on Volume Reduction of Industrial waste water	Remember	3
7	Write a short on Neutralization of Industrial waste water	Remember	3
8	Write a short on Equalization of Industrial waste water	Understand	3
9	Write a short on Proportioning of Industrial waste water	Remember	3
10	Give a short note on Oil Separation	Understand	3

11	What is the process involved in Oil Separation by Floatation	Remember	3
12	How solids are removed from industrial effluent	Understand	4
13	How Oils and grease removal are removed in Industrial in Industrial effluent	Understand	4
14	How biodegradable organic material are removed from Industrial effluent	Remember	4
15	Give the different Methods for treating Organic matter	Remember	4
16	How acids and alkalis are treated. List methods	Understand	4
17	Write the process involved in treating toxic materials	Remember	4
18	What are the different physical treatment methods of Industrial wastewater	Remember	4
19	What are the different Chemical treatment methods of Industrial wastewater	Understand	4
20	What are the different Biological treatment methods of Industrial wastewater	Understand	4

Part - B (Long Answer Questions)

1	Explain the necessity of equalization and proportioning for industrial waste water treatment	Understand	3
2	Enumerate the basic theories of Industrial wastewater management and Explain the strength reduction.	Understand	4
3	What is volume reduction? List and explain any four methods of the volume reduction in industrial wastewater	Remember	4
4	What is the necessity of Neutralization in Industrial waste treatment? Explain the working of the same with suitable examples.	Understand	4
5	Explain the process of Oil Separation by floatation method	Understand	3
6	Explain about the flow equalization process	Understand	3
7	Explain the Neutralization process	Remember	4
8	Discuss the phenomenon of discrete sitting of particles inPrimary treatment process.	Remember	4
9	Explain the various methods of volume and strength reduction adopted for the industrial waste	Remember	3
10	Write a short on theory of sedimentation, grit chamber and its importance	Understand	4
11	Explain the process of coagulation and sedimentation	Remember	3
12	Write a short on solids separation, filtration in Industrial wastewater treatment	Understand	4
13	Brief the various aerobic and anaerobic treatment methods conventionally used in industrial wastewater treatment.	Understand	4
14	Draw the sketches of following and explain the mechanism of the treatment 1).Stabilization ponds, 2).Oxidation ditch	Understand	4
15	Differentiate the equalization and neutralization of industrial waste water	Remember	4
16	Explain the methods used to reduce the volume of the industrial waste water	Understand	5
17	Write short notes on On-line and Off-line equalization?	Remember	5
18	In what different ways the neutralization of industrial wastes is achieved? Explain	Understand	5
19	Explain in detail the process of Pre-Treatment of industrial waste water	Understand	5
20	Explain in detail the process of Primary Treatment of industrial waste water	Remember	5

UNIT-III

Part - A (Short Answer Questions)

1	List the different treatment methods of Wastewater	Remember	5
2	Write a short on Nitrification of Industrial waste water	Understand	5
3	Write a short on Denitrification of Industrial waste water	Understand	5

4	Write the flow sheet of Separate Nitrification System	Remember	5
5	Write a short note Biological Denitrification	Understand	5
6	Write the flow sheet of Separate Denitrification System	Remember	5
7	Give the importance of Phosphorous removal from industrial effluent	Remember	5
8	List the different processes involved in removal of Phosphorous removal from industrial effluent	Remember	5
9	Write a short on Membrane technologies in Phosphorous removal	Understand	5
10	What is the process involved in chemical treatment in Phosphorous removal	Remember	5
11	What is Assimilation in Industrial waste water treatment	Understand	5
12	What is EBPR in Industrial waste water treatment	Understand	5
13	Write a short note on Absorption process in IWWT	Remember	6
14	What is Air Stripping in IWWT?	Understand	6
15	List the different methods of wastewater disposal methods	Remember	6
16	What do you understand by the term “Dilution” in wastewater disposal	Remember	6
17	Give the standards required for the disposal of wastewater by dilution process	Remember	6
18	List the different types of wastewater receiving waters for dilution.	Remember	6
19	Write a short note self-purification of streams	Remember	6
20	What is Eutrophication	Remember	6

Part - B (Long Answer Questions)

1	Write an essay on heavy metal poisoning and their prevention with a suitable example	Understand	5
2	Express the need for the effluent standards and stream standards in waste water treatment	Remember	5
3	Write a short notes on disposal of industrial wastewater after the treatment	Remember	6
4	What do you understand by equalization, neutralization and proportioning? Give examples from industry	Understand	6
5	Why are solvents, grease, cyanide, phenol and sulphates considered undesirable for discharge into public sewers? Explain	Remember	6
6	Explain briefly the nitrogen removal by biological nitrification and denitrification.	Understand	6
7	Enlist & Explain the Factors Affecting Adsorption.	Understand	6
8	Explain the Applications of membrane Technologies in Wastewater treatment	Remember	6
9	List various effects of discharging raw industrial waste to the streams. Briefly explain any four	Remember	6
10	Explain briefly the process of removal of phosphorous in industrial waste water treatment	Understand	6
11	Explain briefly the process of removal of Heavy Metal in industrial waste water treatment	Understand	6
12	Discuss briefly on Air stripping and Absorption processes with respect to Industrial waste water treatment.	Understand	6
13	Discuss any two special treatment methods for treating industrial waste water	Remember	6
14	Elaborate any two disposal methods of treated industrial waste water	Understand	6

Part – C (Critical Thinking)

1	Nothing is a waste – discuss the statement with respect to industrial waste disposal	Remember	6
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2	Give the tolerance limits for Industrial effluents to be discharged into inland surface water sources, as ISI standards for BOD ₅ , Temperature, Total Residual Chlorine and Zinc	Understand	6
3	Give the ISI Standards of Industrial waste water to be discharged on land for irrigation for pH, Oil and Grease, Suspended Solids, BOD ₅ and Cyanide	Remember	6
UNIT-IV			
Part – A (Short Answer Questions)			
1	Give a brief note on sources of wastewater from sugar industry	Remember	7
2	What are the different characteristics of sugar industry effluent	Remember	7
3	Draw a neat sketch of the process of Sugar Industry	Understand	7
4	Give the values of different characteristics of sugar mill waste	Remember	7
5	What is the effect of waste from sugar mill on receiving streams	Understand	7
6	Give a brief note on sources of wastewater from Food Processing Industries	Remember	7
7	What are the different characteristics of Food Processing Industries effluent	Understand	7
8	Draw a neat sketch of the process of Food Processing Industries	Remember	7
9	Give the values of different characteristics of Food Processing Industrial waste	Understand	7
10	What is the effect of waste from Food Processing Industries on receiving streams	Understand	7
11	Give a brief note on sources of wastewater from Steel industry	Remember	7
12	What are the different characteristics of Steel industry effluent	Understand	7
13	Draw a neat sketch of the process of Steel Industry	Understand	7
14	Give the values of different characteristics of Steel industry waste	Remember	7
15	What is the effect of waste from sugar industry on receiving streams	Remember	7
16	Give a brief note on sources of wastewater from Petroleum Refineries	Remember	7
17	What are the different characteristics of Petroleum Refineries effluent	Remember	7
18	Draw a neat sketch of the process of Petroleum Refineries	Understand	8
19	Give the values of different characteristics of Petroleum Refineries waste	Remember	8
20	What is the effect of waste from Petroleum Refineries on receiving streams	Understand	8
Part – B (Long Answer Questions)			
1	Characterize the various treatment processes for food and beverage industry waste water. What are the prospects of waste utilization from food industry	Remember	7
2	Describe the impacts of petroleum exploration and its production on the environment	Understand	8
3	Describe in detail some methods for controlling the pollution from food and beverage Industries	Remember	7
4	a) Between BOD and COD, which one usually assumes highervalue for a food plant? Justify your answer. b) Name two food plants having high value of BOD mentioningthe approx. range of the values. c) What is the prescribed safe disposal limit of BOD?	Understand	8
5	Discuss the characteristics of petrochemical Industrial wastewater	Remember	8
6	Discuss the characteristics of Sugar mill waste water	Understand	8
7	What are the various polluting effluents generated by integrated steel plants?	Understand	8
8	Give the characteristics and treatment of the wastes from sugar industry	Remember	7

UNIT-V			
Part - A (Short Answer Questions)			
1	Give a brief note on sources of wastewater from Textiles Industry	Understand	7
2	What are the different characteristics of Textiles Industry effluent	Remember	7
3	Draw a neat sketch of the process of Textiles Industry	Remember	7
4	Give the values of different characteristics of Textiles Industry waste	Remember	7
5	What is the effect of waste from Textiles Industry on receiving streams	Remember	7
6	Give a brief note on sources of wastewater from Tanneries Industry	Understand	7
7	What are the different characteristics of Tanneries Industry effluent	Remember	7
8	Draw a neat sketch of the process of Tanneries Industry	Remember	7
9	Give the values of different characteristics of Tanneries Industry waste	Understand	7
10	What is the effect of waste from Tanneries Industry on receiving streams	Remember	7
11	Give a brief note on sources of wastewater from Atomic Energy Plants	Remember	8
12	What are the different characteristics of Atomic Energy Plants effluent	Understand	8
13	Draw a neat sketch of the process Atomic Energy Plants	Remember	8
14	Give the values of different characteristics of Atomic Energy Plants waste	Understand	8
15	What is the effect of waste from Atomic Energy Plants on receiving streams	Remember	8
16	Give a brief note on sources of wastewater from Mineral Processing Industries	Remember	8
17	What are the different characteristics of Mineral Processing Industries effluent	Remember	8
18	Draw a neat sketch of the process of Petroleum Refineries	Remember	8
19	Give the values of different characteristics of Mineral Processing Industries waste	Remember	8
20	What is the effect of waste from Mineral Processing Industries on receiving streams	Remember	8
Part - B (Long Answer Questions)			
1	With the neat process flow sheet, highlight the origin and characterization of wastewater generated in typical tannery industry	Understand	9
2	With the neat process flow sheet, highlight the origin and characterization of wastewater generated in textile industry	Understand	9
3	Discuss the characteristics of tannery waste	Understand	9
4	Explain the advantaged and limitations of combined treatment of industrial waste and municipal waste water.	Remember	9
5	What are the sources of various pollution in an integrated cotton Textile mill? Give a plan for the control of this pollution.	Remember	9
6	What are the advantages of combined treatment of industrial waste water with domestic waste water	Understand	9
7	Explain the Neat flow diagram a working of a CEPT. What are the situations in which it is used	Remember	8
8	Describe the characteristics of Atomic Energy plants effluents	Understand	8
9	Describe the characteristics of Mineral processing Industrial effluents	Understand	8
10	Explain the process involved in Joint treatment of Raw Industrial wastewater and Domestic Sewage	Understand	8
11	What are the factors to be considered while selecting the location for Common Effluent Treatment Plants (CEPT)	Remember	8
12	Explain the design procedure of Common Effluent Treatment Plants (CEPT)	Remember	9

13	Explain in detail the operation procedure of Common Effluent Treatment Plants (CEPT)	Understand	9
14	Discuss the various maintenance problems of Common Effluent Treatment Plants (CEPT)	Remember	8

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