

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– VI (NEW) EXAMINATION – WINTER 2021

Subject Code:3160513

Date:30/11/2021

Subject Name:Waste Water Engineering

Time:10:30 AM TO 01:00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) Differentiate between domestic wastewater and industrial wastewater.	03
	(b) Write down the design criteria of Activated Sludge Process	04
	(c) State the purpose of filter presses. Enlist and explain the types of filter	07
Q.2	(a) What are the objectives of Waste water treatment?	03
	(b) Differentiate between extended aeration and tapered aeration	04
	(c) Enlist the various sludge handling equipments used and discuss any one in brief	07
	OR	
	(c) Explain about fluidized bed and expanded bed reactor in Anaerobic treatment of wastewater	07
Q.3	(a) Explain the concept of flocculation and the different types of flocculators	03
	(b) Explain COD test.	04
	(c) Short note on mass balancing in activated sludge process and trickling filter	07
	OR	
Q.3	(a) Enlist various methane precursors in anaerobic decomposition	03
	(b) Explain : Grit Chamber	04
	(c) Explain the purpose of following unit operations/processes in a wastewater treatment plant: (i) Attached growth biological process (ii) Secondary Sedimentation and (iii) Nitrification	07
Q.4	(a) Explain the importance of equalization process in a waste water treatment plant.	03
	(b) Draw a schematic diagram of waste water management infrastructure.	04
	(c) Short note : Duckweed pond and vermiculture	07
	OR	
Q.4	(a) Draw only a neat flow diagram of sludge drying beds	03
	(b) What are the effects of pH, temperature and other parameters on anaerobic treatment	04
	(c) Explain the UASB process with its design criteria	07
Q.5	(a) What can be done to prevent sludge bulking?	03
	(b) Explain root zone technology for wastewater treatment	04
	(c) Short note : Treated wastewater reclamation and reuse	07

		OR	
Q.5	(a)	Define the following terms: (i) Sludge volume index, (ii) Mean cell residence time and (iii) Mixed liquor suspended solids	03
	(b)	List out the characteristics of waste water.	04
	(c)	Write a short note on “Natural evaporation “as a treatment of wastewater.	07

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2022****Subject Code:3160513****Date:06/06/2022****Subject Name:Waste Water Engineering****Time:10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

MARKS

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|------------|-----|---|-----------|
| Q.1 | (a) | List challenges involved in wastewater treatment? And explain to one. | 03 |
| | (b) | Explain in detail the wastewater collection system. | 04 |
| | (c) | Explain in detail the roadmap of the sequential batch reactor for wastewater treatment. | 07 |
| Q.2 | (a) | What is the sampling protocol for wastewater? | 03 |
| | (b) | Develop mass balance for activated sludge process. | 04 |
| | (c) | Explain with a flow diagram the activated sludge process. | 07 |
| | | OR | |
| | (c) | Explain the attached growth process with trickling filters. | 07 |
| Q.3 | (a) | Interpret the importance of pH in the anaerobic treatment process. | 03 |
| | (b) | Explain up-flow anaerobic sludge blanket (UASB) reactor. | 04 |
| | (c) | List recent advanced technologies in wastewater treatment. Explain detail to anyone. | 07 |
| | | OR | |
| Q.3 | (a) | Discuss the importance of temperature in the anaerobic treatment process. | 03 |
| | (b) | Discuss the concept of the anaerobic contact process. | 04 |
| | (c) | Explain the importance of duckweed ponds in the field of wastewater engineering. | 07 |
| Q.4 | (a) | Why do we need to reuse treated wastewater? | 03 |
| | (b) | Explain the process of expanded bed reactors for anaerobic wastewater treatment. | 04 |
| | (c) | Discuss in detail the treatment methodology for sugar industry wastewater. | 07 |
| | | OR | |
| Q.4 | (a) | Explain the ground water recharge system. | 03 |
| | (b) | Discuss the anaerobic filter system used for wastewater treatment. | 04 |
| | (c) | Explain the wastewater treatment process for pharmaceutical industries. | 07 |
| Q.5 | (a) | Write Indian standards for disposal of effluent water in the environment. | 03 |
| | (b) | Why is it necessary to understand a process flow sheet for an efficient wastewater treatment process? | 04 |
| | (c) | Discuss the treatment methodology for pulp and paper industry wastewater. | 07 |

OR

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|------------|-----|---|-----------|
| Q.5 | (a) | What is vermiculture technology for wastewater treatment? | 03 |
| | (b) | Brief on wastewater characteristics? | 04 |
| | (c) | Explain the wastewater treatment process for dye and intermediate industries. | 07 |
