ADAMAS UNIVERSITY PURSUE EXCELLENCE	**ADAMAS UNIVERSITY** **END (EVEN) SEMESTER EXAMINATION : MAY 2021** (Academic Session: 2020 – 21)		
Name of the Program:	B. Tech.	**Semester:**	VIII
Paper Title :	Environmental Engineering-II	**Paper Code:**	ECE44102
Maximum Marks :	40	**Time duration:**	3 hrs.
Total No of questions:	08	**Total No of Pages:**	03
(Any other information for the student may be mentioned here)	1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam. 2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page. 3. Assumptions made if any, should be stated clearly at the beginning of your answer.		

Answer all the Groups

Group A

Answer all the questions of the following 5×1=5

1. a) Through the measurement of the electrical conductivity of the wastewater one can determine the:
   (i) oxygen content.
   (ii) concentration of total ions.
   (iii) acidity.
   (iv) heavy metal content.
   (v) concentration of organic acids.

b) Nitrogen is present in wastewater in various forms and compounds.Which of the listed "parameters" is a pure organic composition?
   (i) Kjeldahl nitrogen (TKN)
   (ii) Amino acid
   (iii) Uric acid (C_5 H_4 N_4 = O_3)
   (iv) Total nitrogen (total N)
   (v) Nitrogen in total (N_{tot})

c) With sewer construction what do you understand under the terms "Length of reach [sewer section]"?
   (i) Length of the back-up in the sewer.
   (ii) Covering of the sewer.
   (iii) Maximum length of the sewer.
   (iv) Useful life of a sewer.
   (v) Separation between two manholes.

d) How often must a mechanically cleaned screen be monitored by the operating personnel?
   (i) Once or twice a week.
   (ii) Only at the weekend.
   (iii) Once a month.

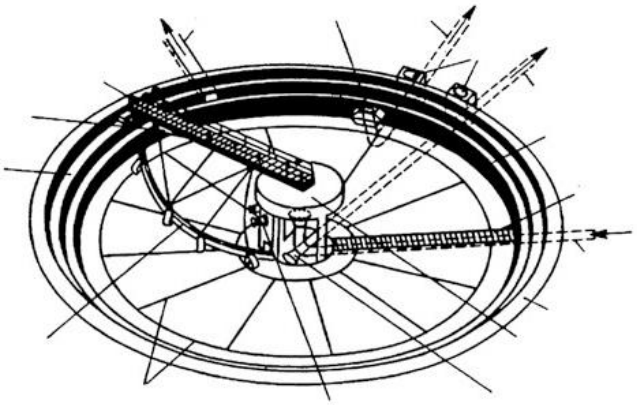
(iv) Once or twice a day.
(v) Almost never, runs automatically.

e) Which procedure of wastewater treatment takes place without oxygen?
(i) Degradation of dissolved organic carbon compounds.
(ii) Nitrification.
(iii) Denitrification.
(iv) Release of phosphates for the production of energy.
(v) Storage of phosphates as energy reserve.

Group –B

Answer **any three** of the following 3×5=15

2. Allocate the elements a) to e) below to the appropriate numbers in the top view of the primary settling tank shown:
a) Tank inlet.
b) Bottom clearing scraper.
c) Skimmer.
d) Sludge hopper.
e) Tank outlet.



3. Calculate the ultimate BOD for a sewage whose 5 day BOD at 20^0C is 250 mg/l. What will be the BOD after 2 days? [Assume K = 0.23 per day]

4. In the biological wastewater treatment there are two basic processes: the activated sludge and the fixed-bed processes. Explain the differences with regard to the important characteristics of the bacteria.

5. Short Notes (Write any two)
(i) Facultative ponds
(ii) Imhoff tank
(iii) IFAS process

Group –C

Answer **any two** of the following 2×10=20

6. The mechanical treatment stage in wastewater treatment plants in addition to grit chamber and primary settling tank also includes screens and sieves.
a) Name the different models of screens.
b) Name the different models of sieves.
c) Which rates of flow [m/s] should not be undercut in the screen chamber respectively not exceeded between the screen bars? Justify your answer.

7. The external diameter of a concrete pipe is 1,000 mm. The wall thickness of the concrete pipe is 10 % of the external diameter.
   a) Calculate the internal diameter and the wall thickness of the pipe.
   b) Calculate the mass of the pipe (in t) with a length of 2.0 m and a density ρ (concrete) of 2.5 kg/m^3.

8. Short Notes (Write any two)
   (i) Nitrification and Denitrification
   (ii) Activated sludge
   (iii) Lagoon design

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