MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

VI SEMESTER B.TECH. GRADE IMPROVEMENT EXAMINATIONS

JANUARY 2021

SUBJECT: DESIGN OF BIOLOGICAL TREATMENT PROCESSES [BIO 4002]

Max. Marks: **50**

Instructions to Candidates:

- Answer ALL the questions & missing data may be suitable assumed

1A.	How can one estimate the soluble BOD concentration in each stage of a rotating biological contactor?	**3**
1B.	What is the operational mode difference between Biocarbone® process and Biofor® process? For what type of treatment processes are they used?	**3**
1C	How is the generalized curve obtained during breakpoint chlorination of wastewater? With a schematic plot, explain the different regions in the same.	**4**
2A.	How is the rotational speed determined for a rotary distributor of a trickling filter	**2**
2B.	Enlist the principal categories of municipal wastewater reuse, in ascending order of reuse volume.	**4**
2C.	Present a detailed schematic of an idealized representation of cross section of biological slime in a trickling filter. Label it with all the parameters.	**4**
3A.	Draw the labelled industrial set-up used for preanoxic biological nitrogen removal processes.	**2**
3B.	How does the concentration of a disinfectant affect its action? Explain in mathematical terms.	**4**
3C.	How are fluidized bed bioreactors used for submerged attached growth processes? State any two advantages.	**4**
4A.	What are the different classes of microbes present in trickling filters? State with examples.	**3**
4B.	What is the significance of staging the units in a rotating biological contactor? Describe the various configurations used.	**7**
5A.	Present a labelled diagram showing the use of contact filtration process for water reclamation.	**2**
5B.	Give a detailed description of all the operational steps of a sequencing batch reactor, with corresponding diagrams.	**8**