

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)**

**CLASS: BTECH
BRANCH: CSE**

**SEMESTER : V
SESSION : MO/2025**

SUBJECT: BE320 BIOTREATMENT OF MUNICIPAL & INDUSTRIAL WASTE

TIME: 3 Hours

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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Q.1(a)	What do you mean by urban wastewater management system? Mention need of it and propose a design for wastewater management system in BIT Mesra.	[5] 3	6
Q.1(b)	Sample collected from boys' hostel of a college have BOD ₅ level of 300mg/L. If rate of reaction k is 0.25 per day, then calculate BOD after 3 days.	[5] 4	4
Q.2(a)	It was estimated that per person daily output of wastewater constituents are as follows: BOD 60g/capita.day, TSS 70g/capita.day and NH ₃ -N 5g/capita.day. Assume BIT Mesra campus population is 12000 and per capita wastewater output is 50L. Calculate daily load of BOD, TSS and NH ₃ -N in unified wastewater stream. Present your answer as g constituents per m ³ wastewater.	[5] 3	4
Q.2(b)	Explain need of unit operations in preliminary treatment in municipal wastewater system. Also, substantiate your answer by showing the application of screens for the same.	[5] 3	5
Q.3(a)	What is activated sludge? Demonstrate construction and operation of trickling filter for municipal wastewater reclamation.	[5] 5	3
Q.3(b)	Outline the importance of anaerobic wastewater treatment system. Demonstrate construction and operation of upflow sludge blanket reactor for municipal wastewater reclamation.	[5] 5	3
Q.4(a)	What do you mean by nutrients in wastewater treatment system? Mention its importance. Develop a process for removal of nutrients from wastewater.	[5] 3	6
Q.4(b)	Demonstrate a method for reclamation of coal gasification water and critically discuss the process.	[5] 4	3
Q.5(a)	Draw an equipment to be used as low scale composting facility in your hostel. Also, justify your selection and mention its operation.	[5] 2	5
Q.5(b)	Give a self-explanatory diagram of pit constructed for landfill. Also, mention how to prevent leakage of leachate from it.	[5] 5	6

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