



VII SEMESTER B.TECH (CIVIL ENGINEERING)

END SEMESTER EXAMINATIONS, NOVEMBER 2022

SUBJECT: FECAL SLUDGE AND SEPTAGE MANAGEMENT [CIE 4079]

Date of Exam: 21/11/2022

Time: 3 hrs.

Max. Marks: 50

Instructions to Candidates:

❖ Answer ALL the questions & any missing data may be suitably assumed

Q. No.	Question	Marks	CO
1A.	Write a short note on Container-based Sanitation (CBS). Enlist (any six) benefits of CBS.	5	CO1
1B.	Explain processes involved in the treatment of fecal sludge in septic tank.	3	CO1
1C.	Write a short note on Tiger Toilet.	2	CO1
2A.	With a neat sketch explain the Imhoff Tank for solid-liquid separation of fecal sludge.	5	CO2
2B.	With a neat sketch explain the Lock and key hypothesis for enzyme activity.	3	CO2
2C.	With a neat sketch explain enzyme inhibition.	2	CO2
3A.	Amaravati Township Authorities are planning to construct settling-thickening tanks for FS treatment. Each week, one tank will be used for receiving FS while the other tank will be pumped out and cleared from the scum layer. The FS is dilute with an average suspended solids (SS) of 5 g/L. Continuous monitoring of sludge characteristics was conducted, and reported below: Mean daily influent flow = 140 m ³ /day Peak coefficient = 1.6 Daily operating hours of the treatment plant = 7 number of treatment plant operating days per week = 5 Flow velocity = 0.5 m/h Concentration of SS in thickened sludge = 60 g/L Design a settling-thickening tank for SS settling efficiency of 80%.	5	CO2
3B.	Write a short note on Sludge Collection Method.	3	CO2
3C.	Write a short note on Sludge Dewatering.	2	CO2
4A.	Explain the design considerations (any ten) for the co-composting of fecal sludge and solid wastes.	5	CO3

4B.	Explain the financial, technical and managerial inputs (any six) required for operation of fecal sludge treatment plant.	3	CO3
4C.	Enlist the essential baseline data for planning septage management.	2	CO3
5A.	With a neat sketch explain the integrated collection, transport and treatment model of financial transfers in fecal sludge management.	5	CO4
5B.	Explain (any six) roles of institutional framework in fecal sludge management.	3	CO4
5C.	Enlist the major financial transfers involved in fecal sludge management.	2	CO4