LIBRARY BANGALORE-A9

CBCS SCHEME

USN | | | | | | | | | |

BCV304

Third Semester B.E./B.Tech. Degree Examination, June/July 2026
Water Supply and Wastewater Engineering

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

			M	L	C
		Module – 1			
Q.1	**a.**	List out various types of water demands. Explain any two of them in detail.	**10**	**L2**	**CO1**
	b.	The following data are available for a town. Estimate the probable population in the year 2031 and 2041 by Incremental Increase Method (IIM). Year: 1991 | 2001 | 2011 | 2021 Population: 80000 | 120000 | 168000 | 228000	**10**	**L3**	**CO1**
		OR			
Q.2	**a.**	Explain the factors affecting the per capita demand of a town.	**10**	**L2**	**CO1**
	b.	Compute the fire demand for a city having population 2,00,000 using five available formulae.	**10**	**L3**	**CO1**
		Module – 2			
Q.3	**a.**	Mention the objectives of Aeration. Classify the aerators and explain any tow of them.	**10**	**L2**	**CO2**
	b.	Design slow sand filters with 5 units for a city to treat 5 MLD of water. Maximum demand may be assumed to be 2 times the average daily demand. Rate of filtration may be taken as 150 lts/hr/m^2.	**10**	**L3**	**CO2**
		OR			
Q.4	**a.**	With the aid of neat sketch explain the working and back washing of rapid sand filter unit.	**10**	**L2**	**CO2**
	b.	A rectangular settling tank without mechanical equipment is to treat 1.8 million liters per day of raw water. The sedimentation period is to be 4 hrs the velocity of flow 8 cm/minute, and the depth of water and sediment is 4.2 m. If an allowance of 1.2 m for sediment is made, compute the size of the sedimentation tank.	**10**	**L3**	**CO2**

VTU-30-06-2026 08:43:34am - EP - EP - EP

		Module – 3			
Q.5	**a.**	List out various methods adopted to disinfect the raw water. Explain any four methods along with merits and demerits.	**10**	**L2**	**CO3**
	b.	With the aid of chemical reactions explain the methods of removing permanent hardness.	**10**	**L2**	**CO3**
		OR			
Q.6	**a.**	Define the following terms : i) Garbage ii) Rubbish iii) Sullage iv) Sewage v) Dry weather flow.	**10**	**L1**	**CO3**
	b.	Explain the different types of water carriage systems of sewerage along with merits and demerits.	**10**	**L2**	**CO3**
		Module – 4			
Q.7	**a.**	Write a flow chart of a typical wastewater treatment plant and explain the role of each unit.	**10**	**L2**	**CO4**
	b.	Design a suitable Grit chamber for a sewage treatment plant getting a dry weather flow from a separate sewerage system at 400 lit/sec. Assume the flow velocity through the tank as 0.2 m/sec and detention period of 2 min. The maximum flow may be assumed to be 3 times the daily DWF.	**10**	**L3**	**CO4**
		OR			
Q.8	**a.**	Explain the Activated Sludge Process as a biological treatment adopted to treat municipal sewage.	**10**	**L2**	**CO4**
	b.	An average operating data for conventional activated sludge treatment plant is as follows : i) Waste water flow = 50000 m^3/d ii) Volume of aeration tank = 15500 m^3 iii) Influent BOD = 200 mg/ℓt iv) Effluent BOD = 25 mg/ℓt v) MLSS = 3000 mg/ℓt vi) Effluent suspended solids = 40 mg/ℓt vii) Waste sludge suspended solids = 12000 mg/ ℓt viii) Quantity of waste sludge = 250 m^3/d Determine the following : i) Aeration period (hours) ii) F/M ratio iii) Percentage efficiency of BOD removal iv) Sludge age (days).	**10**	**L3**	**CO4**

VTU-30-06-2026 08:43:34am - EP - EP - EP

					BCV304
		Module – 5			
Q.9	**a.**	List out the operating troubles of trickling filters and explain in brief.	**10**	**L2**	**CO5**
	b.	With the help of neat sketch explain the construction and working of trickling filters.	**10**	**L2**	**CO5**
		OR			
Q.10	**a.**	Write a note on the following : i) Oxidation Ditch ii) Stabilization Pond.	**10**	**L2**	**CO5**
	b.	Describe the Anaerobic sludge digester in treating the wastewater.	**10**	**L2**	**CO5**

* * * * *

VTU-30-06-2026 08:43:34am - EP - EP - EP - EP - EP - EP - EP
30-06-2026 09:03:20am - EP - EP - EP - EP - EP - EP - EP