CBCS SCHEME - Make-Up Exam

USN | 1 | A | Y | 2 | 4 | C | V | 4 | 0 | 4 |

BCV304

Third Semester B.E/B.Tech. Degree Examination, June/July 2025
Water Supply and Waste Water Engineering

Time: 3 hrs. Max. Marks:100

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

		Module – 1	M	L	C
1	a.	Explain the need of planned water supply scheme in present day community life.	7	L2	CO1
	b.	The population of a city in three consecutive years i.e. 2001, 2011 and 2021 is 80,000, 2,50,000 and 4,80,000 respectively. Determine (i) The saturation population (ii) The equation of logistic curve (iii) The expected population in 2031.	9	L3	CO1
	c.	Enumerate the fire demand in water supply.	4	L2	CO1
		OR			
2	a.	What is meant by design period? Discuss the factors affecting design period.	6	L2	CO1
	b.	The population statistics of a Town are given below : Years: 1991 | 2001 | 2011 | 2021 Population: 80,000 | 1,20,000 | 1,68,000 | 2,28,000 Estimate probable population in the year 2051 by geometrical and incremental increase method.	8	L3	CO1
	c.	Enumerate the various physical and chemical characteristics of water and highlight the importance of each parameter.	6	L2	CO1
		Module – 2			
3	a.	Briefly explain the complete treatment process of a water supply scheme with flow chart.	9	L2	CO2
	b.	What is Aeration? Explain the types of aerators.	5	L2	CO2
	c.	What is optimum dosage of coagulant? Explain how it is determined in the laboratory.	6	L2	CO2
		OR			
4	a.	Explain :(i) Detention period (ii) Surface loading (iii) Basin dimensions related to design of sedimentation tank	6	L2	CO2
	b.	Explain the theory of filtration.	6	L2	CO2
	c.	Design of 12 slow sand filter beds for a population of 2,50,000. Rate of filtration – 500 Lt/hr/m^2. Assume the data as follows per capita demand – 135 LPCD. Length of each bed = 2.5 times the breadth, Peak demand = 1.5 Avg demand.	8	L3	CO2

		Module – 3			
5	a.	Explain the zeolite processes of wate softening with sketch. Write down the relevant chemical equation.	**10**	**L2**	**CO3**
	b.	What is meant by disinfection of water? Discuss the theory of disinfection by Chlorine.	**6**	**L2**	**CO3**
	c.	Explain break point chlorination graphically.	**4**	**L3**	**CO3**
		OR			
6	a.	Explain briefly the different types of water carriage system.	**10**	**L2**	**CO3**
	b.	Calculate 3 day BOD and ultimate BOD of a sample of sewage for the following data : (i) DO of Raw sewage 0.6 mg/L (ii) DO of dilution water 6 mg/L (iii) DO of mix dilution water and sewage after 3 days of incubation 1.1 mg/L (iv) Dilution ratio is 3% (v) Assume K = 0.12/day at test temperature.	**10**	**L3**	**CO3**
		Module – 4			
7	a.	Write the flow diagram of Treat Municipal waste water and indicate the importance of each Photon unit.	**10**	**L2**	**CO4**
	b.	Design a primary sedimentation tank of circular cross section, for a sewage of 10 MLD, detention period of 2 hours and assume surface loading rate to be 30 $m^3/m^2/day$.	**10**	**L3**	**CO4**
		OR			
8	a.	Explain the working of Grit chamber and skimming tank with figures.	**10**	**L2**	**CO4**
	b.	Mention the modification of activated sludge processes. Explain any two of them.	**10**	**L2**	**CO4**
		Module – 5			
9	a.	With the help of a neat sketch, explain the working of Trickling filters.	**10**	**L2**	**CO5**
	b.	Write note on : (i) Bio Towers (ii) Rotating Biological contactor.	**10**	**L2**	**CO5**
		OR			
10	a.	With flow diagram, explain the sludge treatment unit operation and processes.	**10**	**L2**	**CO5**
	b.	With neat sketch, explain the stages in Anaerobic Digestion of sludge.	**10**	**L2**	**CO5**

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