



**Third Semester B.E./B.Tech Degree Supplementary Examination,  
June/July 2024**

**Water Supply and Waste Water 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.*

		<b>Module – 1</b>	<b>M</b>	<b>L</b>	<b>C</b>																
<b>Q.1</b>	<b>a.</b>	Explain the different types of water demands.	<b>10</b>	<b>L2</b>	<b>CO1</b>																
	<b>b.</b>	Describe the population of a city in 2011 by : i) Arithmetic increase method ii) Geo metric increase method iii) Increase metal increase method.	<b>10</b>	<b>L3</b>	<b>CO1</b>																
		<table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th style="padding: 2px;">Year</th> <th style="padding: 2px;">1931</th> <th style="padding: 2px;">1941</th> <th style="padding: 2px;">1951</th> <th style="padding: 2px;">1961</th> <th style="padding: 2px;">1971</th> <th style="padding: 2px;">1981</th> <th style="padding: 2px;">1991</th> </tr> </thead> <tbody> <tr> <td style="padding: 2px;">Population (in towards)</td> <td style="padding: 2px;">12</td> <td style="padding: 2px;">16.5</td> <td style="padding: 2px;">26.8</td> <td style="padding: 2px;">41.5</td> <td style="padding: 2px;">57.5</td> <td style="padding: 2px;">68</td> <td style="padding: 2px;">74.1</td> </tr> </tbody> </table>	Year	1931	1941	1951	1961	1971	1981	1991	Population (in towards)	12	16.5	26.8	41.5	57.5	68	74.1			
Year	1931	1941	1951	1961	1971	1981	1991														
Population (in towards)	12	16.5	26.8	41.5	57.5	68	74.1														
<b>OR</b>																					
<b>Q.2</b>	<b>a.</b>	Explain any five chemical characteristics of water.	<b>10</b>	<b>L2</b>	<b>CO1</b>																
	<b>b.</b>	Compute the fire demand for the city having population of 140000 using various formulas and also explain the factors affecting fire demand.	<b>10</b>	<b>L3</b>	<b>CO1</b>																
<b>Module – 2</b>																					
<b>Q.3</b>	<b>a.</b>	With a neat sketch, explain screen chamber.	<b>10</b>	<b>L2</b>	<b>CO2</b>																
	<b>b.</b>	Find the dimension of a rectangular sedimentation basin with the following data : Volume of water to treated = 3MLD Detention period = 4 hrs Velocity of flow = 10 cm/min	<b>10</b>	<b>L3</b>	<b>CO2</b>																
<b>OR</b>																					
<b>Q.4</b>	<b>a.</b>	With a neat sketch, and explain Jar test.	<b>10</b>	<b>L2</b>	<b>CO2</b>																
	<b>b.</b>	Explain the rapid sand filter with a neat sketch.	<b>10</b>	<b>L2</b>	<b>CO2</b>																
<b>Module – 3</b>																					
<b>Q.5</b>	<b>a.</b>	With a neat sketch explain break point chlorination.	<b>10</b>	<b>L2</b>	<b>CO3</b>																
	<b>b.</b>	Explain any five chemical waste water characteristics.	<b>10</b>	<b>L2</b>	<b>CO3</b>																

OR

Q.6	a.	Explain the classification of water carriage system along with their merits and demerits.	10	L2	CO3
	b.	Explain : i) self cleansing velocity ii) non-scouring velocity in sewage system.	10	L2	CO3

Module – 4

Q.7	a.	Explain the flow diagram of waste water treatment unit operations and unit process.	10	L2	CO4
	b.	With a neat sketch, explain the activated sludge process.	10	L2	CO4

OR

Q.8	a.	Explain i) HRT ii) SRT iii) F/M ratio iv) Sludge volume Index with respect to activated sludge process.	10	L3	CO4
	b.	Explain any two modified activated sludge process.	10	L2	CO4

Module – 5

Q.9	a.	With a neat sketch explain trickling filter.	10	L2	CO5
	b.	With a neat explain rotating biological contractor.	10	L2	CO5

OR

Q.10	a.	With a neat explain the oxidation pond.	10	L2	CO5
	b.	With a neat sketch explain aerobic and anaerobic sludge digesters.	10	L2	CO5

\*\*\*\*\*