#### S J C Institute of Technology, Chickballapur Department of Civil Engineering <u>CO-PO and CO-PSO Mapping</u>

### Name of the Faculty: Vathsala MN & Kamath GM

### Subject: WATER SUPPLY AND TREATMENT ENGINEERING Sub code: 17cv64 - C33

#### Semester: VI

**Course Objectives:** 

- Analyze the variation of water demand and to estimate water requirement for a community.
- Evaluate the sources and conveyance systems for raw and treated water.
- Study drinking water quality standards and to illustrate qualitative analysis of water.
- Design physical, chemical and biological treatment methods to ensure safe and potable water Supply..

#### **Course Outcomes:**

At the end of the course students should be able to:

C01	Estimate average and peak water demand for a community.
CO2	Evaluate available sources of water, quantitatively and qualitatively and make appropriate choice for a community.
CO3	Evaluate water quality and environmental significance of various parameters and plan suitable treatment system.
CO4	Design a comprehensive water treatment and distribution system to purify and distribute water to the required quality standards.

					СО	P-PO Mapping								CO-PSO Mapping	
网络影戏口	PO1	PO2	PO3	PO4	PO5	PO6	PO7	<b>PO8</b>	PO9	PO10	PO11	PO12		PSO2	
C01	3	2	1 1 1 2 2 4			1	1	1 1		al a cara a Secolar a cara a		in a star	1		
CO2	2<		Ser State		andre l <sup>2</sup> e andre l	2	- <b>15,1</b> v. * 11,7 (62)	2	er a wild	and a start	Avene	State Le		1	
<b>CO3</b>	3	2	1	1		1. 1944 - 1	1	3		i sala d	-3 (A 19)	Real of	一般的	ad py	
CO4	3	3	3	The second		2	2	1	11		Sector State			31	
Avg	2.75	2.5	1.66	1	a state	1.67	1.67	1.75	and the			1		1	
	The state of the second		1: 5	Slightly	/	2: N	lodera	tely	3:	Subst	antially				

#### Justification:

CO1: - The students can understand the basic needs of water supply. Pollution forecasting, water demand

When it is not it is seen in the shear is the state

for various needs adopted by the engineers to update in the field of water supply. CO2: -students will have ability to identify to plan analyze design of sewer section by

external factors. Students will have ability to change and lifelong learning in the broad context of

CO3: - The students will have ability to analyze complex problems but in reality students unable to take

CO4:-The students gain knowledge about types of treatments with appropriate design consideration to the second se

treate water supply.

### Justification for CO-PSO's:

PSO1, PSO2:-The students able to estimate the quantity of water requirement along with 12020 good foundation in mathematics basic sciences technical.

HOD

Signa

Signature of Committee members

- 1. Mr. Ravindra MV
- 2. Ms. Vathsala MN
- 3. Mr. Kamath GM

CO1       CO1       297       99       3       201       99       2       289       99       2.9       2.5       83       YES         CO2       CO2       258       98       2.6       201       99       2       293       99       3       2.3       78       YES         CO3       CO3       293       99       3       201       99       2       285       99       2.9       2.5       83       YES         CO4       CO4       297       99       3       201       99       2       293       99       3       2.5       83       YES         CO4       CO4       297       99       3       201       99       2       293       99       3       2.5       84       YES         CO4       CO4       297       99       3       201       99       2       293       99       3       2.5       84       YES         CO4       CO4       297       99       3       201       99       2       293       99       3       2.5       84       YES         CO4       CO4       297       99       3	SJCIT/NBA/ CO-PO-PSO REPT/ 2019-20			j.			Chic Departm	kballap ient of (	ur - 562 Civil Eng	INOLOG 101 gineerin				
Faculty Name         Vathsala MN& Kamath GM         No.students         99           Summary of CO attainments of Sub: 17CV64 Based on (AVERAGE-TYPE-1) Academic Year:2019-20         CO         CIE         SEE         TOT_Attainment           CO1         CO1         297         99         3         201         99         2         289         99         2.9         2.5         83         YES           CO2         CO2         258         98         2.6         201         99         2         289         99         2.9         2.5         83         YES           CO3         CO3         293         99         3         201         99         2         285         99         2.9         2.5         83         YES           CO3         CO3         293         99         3         201         99         2         285         99         2.9         2.5         83         YES           CO4         CO4         297         99         3         201         99         2         293         99         3         2.5         84         YES           CO4         CO4         297         99         3         2.4         2.45				Wate	er Suppl	y and Ti	reatmen	t Engin	eering	_	Cours	e Code	C	313
Summary of CO attainments of Sub: 17CV64 Based on (AVERAGE-TYPE-1) Academic Year:2019-20         CO       CLE       SEE       CCS       TOT_Attainment         CO       CLE       SEE       CCS       TOT_Attainment         CO       CCIP       SUMMARY of CO attainments of Sub: 17CV64 Based on (AVERAGE-TYPE-1) Academic Year:2019-20         CO2       CO3       CO4       C			17	CV64			_		tion	A & B				
CO         CID_CO         CIE         SEE         CES         TOT_Attainment           CO1         C01         297         99         3         201         99         2         289         99         2.9         2.5         83         YES           CO2         CO2         258         98         2.6         201         99         2         283         99         3         2.3         78         YES           CO3         CO3         293         99         3         201         99         2         285         99         2.9         2.5         83         YES           CO4         CO4         297         99         3         201         99         2         293         99         3         2.5         84         YES           CO4         CO4         297         99         3         201         99         2         293         99         3         2.5         84         YES           CO4         CO4         297         99         3         201         99         2         293         294         2.9         2.9         2.9         2.9         2.9         2.9         2.9	Fa	culty Name			Vaths	ala MN	ala MN& Kamath GM				No.sti	udents		99
CO         CID_CO         CIE         SEE         CES         TOT_Attainment           CO1         C01         297         99         3         201         99         2         289         99         2.9         2.5         83         YES           CO2         CO2         258         98         2.6         201         99         2         283         99         3         2.3         78         YES           CO3         CO3         293         99         3         201         99         2         285         99         2.9         2.5         83         YES           CO4         CO4         297         99         3         201         99         2         293         99         3         2.5         84         YES           CO4         CO4         297         99         3         201         99         2         293         99         3         2.5         84         YES           CO4         CO4         297         99         3         201         99         2         293         294         2.9         2.9         2.9         2.9         2.9         2.9         2.9	5	Summary of CO	) attain	ments o	of Sub:	17CV64	Based o	on (AVE	RAGE-T	YPE-1)	Academ	nic Year	:2019-	20
CU       S_AT       T_ST       ATN       S_AT       T_ST       ATN       S_AT       T_ST       ATN       S_AT       T_ST       ATN       ATN       ATN       M       %       State         CO1       C01       297       99       3       201       99       2       289       99       2.9       2.5       83       Yes         CO2       CO2       258       98       2.6       201       99       2       283       99       3       2.3       78       Yes         CO3       CO3       293       99       3       201       99       2       283       99       2.9       2.5       83       Yes         CO4       CO4       297       99       3       201       99       2       293       99       3       2.5       84       Yes         CO4       CO4       297       99       3       201       99       2       233       99       3       2.5       84       Yes         Summary of PO attainments of Sub:       17CV64 Based on (AVERAGE-TYPE-1) Academic Year:2019-20       PO       Number       1       2       3       2.45       2.44       2.45       <						Ι		•						
CO2       CO2       258       98       2.6       201       99       2       293       99       3       2.3       78       YES         CO3       CO3       293       99       3       201       99       2       293       99       3       2.3       78       YES         CO4       CO4       297       99       3       201       99       2       293       99       3       2.5       83       YES         CO4       CO4       297       99       3       201       99       2       293       99       3       2.5       84       YES         CO4       CO4       297       99       3       201       99       2       293       99       3       2.5       84       YES         CO4       CO4       297       99       3       201       99       2       293       99       3       2.5       84       YES         Summary of PO attainments of Sub: 17CV64 Based on (AVERAGE-TYPE-1) Academic Year:2019-20       PO       1       1       1       1       1       2       3       4       5       6       7       8       9       10       11	0	CID_CO	S_AT	T_ST	ATN	S_AT	T_ST	ATN	S_AT	T_ST	ATN			Statu
CO3       CO3       293       99       3       201       99       2       285       99       2.9       2.5       83       YES         CO4       CO4       297       99       3       201       99       2       285       99       2.5       83       YES         CO4       CO4       297       99       3       201       99       2       293       99       3       2.5       84       YES         Summary of PO attainments of Sub: 17CV64 Based on (AVERAGE-TYPE-1) Academic Year:2019-20       PO Number       1       2       3       4       5       6       7       8       9       10       11       12         Direct ATINT(D)       2.41       2.39       2.41       2.45       2.37       2.41       2.39       2.9       2.98       2.96       2.94       2.9       2.93         Total-ATNT       2.46       2.44       2.46       2.5       2.42       2.46       2.44       2.45       2.5         ATNT TO SCALE       2.26       2.03       1.36       0.83       1.37       1.37       1.42       0       0.8         3       2.46       2.44       2.46       2.5 <th< td=""><td>CO1</td><td>CO1</td><td>297</td><td>99</td><td>3</td><td>201</td><td>99</td><td>2</td><td>289</td><td>99</td><td>2.9</td><td>2.5</td><td>83</td><td>YES</td></th<>	CO1	CO1	297	99	3	201	99	2	289	99	2.9	2.5	83	YES
CO4       CO4       297       99       3       201       99       2       293       99       3       2.5       84       YES         Summary of PO attainments of Sub: 17CV64 Based on (AVERAGE-TYPE-1) Academic Year:2019-20         PO Number       1       2       3       4       5       6       7       8       9       10       11       12         Direct ATINT(D)       2.41       2.43       2.45       2.37       2.41       2.39       2.43         Indirect ATINT(D)       2.41       2.46       2.5       2.42       2.46       2.44       2.45         1       2       3       4       5       6       7       8       9       10       11       12         Direct ATINT(D)       2.41       2.46       2.55       2.42       2.46       2.44       2.45       2.5         ATNT TO SCALE       2.26       2.03       1.36       0.83       1.37       1.37       1.42       0       0.8         3       2.46       2.44       2.46       2.5       2.42       2.46       2.44       2.5         2       0       0       0       0       0       0       0	CO2	CO2	258	98	2.6	201	99	2	293	99	3	2.3	78	YES
Summary of PO attainments of Sub: 17CV64 Based on (AVERAGE-TYPE-1) Academic Year:2019-20         PO Number       1       2       3       4       5       6       7       8       9       10       11       12         Direct ATNT(D)       2.41       2.39       2.41       2.45       2.37       2.41       2.39       2.41       2.45         Total-ATNT       2.46       2.44       2.45       2.37       2.44       2.45       2.37       2.41       2.39       2.41       2.45         3       2.46       2.46       2.55       2.42       2.46       2.44       2.45       2.55         4       1.37       1.37       1.42       0.83       0.83       1.37       1.42       0.83         3       2.46       2.44       2.45       2.42       2.46       2.44       2.55         4       0       0       0       0       0       0       0       0       0       0       0         3       2.46       2.44       2.45       2.42       2.46       2.44       2.5       2.45       2.44       2.5         4       0       0       0       0       0       0       0 </td <td>CO3</td> <td>CO3</td> <td>293</td> <td>99</td> <td>3</td> <td>201</td> <td>99</td> <td>2</td> <td>285</td> <td>99</td> <td>2.9</td> <td>2.5</td> <td>83</td> <td>YES</td>	CO3	CO3	293	99	3	201	99	2	285	99	2.9	2.5	83	YES
PO Number       1       2       3       4       5       6       7       8       9       10       11       12         Direct ATNT(D)       2.41       2.39       2.41       2.45       2.37       2.41       2.39       2.4       2.42         Indirect ATNT(D)       2.95       2.96       2.98       2.9       2.98       2.96       2.94       2.9       2.93       2.96       2.94       2.4       2.45         Total-ATNT       2.46       2.44       2.46       2.5       2.42       2.46       2.44       2.4       2.5         ATNT TO SCALE       2.26       2.03       1.36       0.83       1.37       1.37       1.42       0       0.83         1       2       3       4       5       6       7       8       9       10       11       12         2.45       2.44       2.46       2.5       2.42       2.46       2.44       2.5       2.42       2.46       2.44       2.5       2.42       2.46       2.44       2.5       2.41       2.5       2.42       2.46       2.44       2.5       2.42       2.46       2.44       2.5       2.43       2.41       2.	CO4	CO4	297	99	3	201	99	2	293	99	3	2.5	84	YES
PO Number       1       2       3       4       5       6       7       8       9       10       11       12         Direct ATNT(D)       2.41       2.39       2.41       2.45       2.37       2.41       2.39       2.4       2.42         Indirect ATNT(D)       2.95       2.96       2.98       2.9       2.98       2.96       2.94       2.9       2.93       2.96       2.94       2.4       2.45         Total-ATNT       2.46       2.44       2.46       2.5       2.42       2.46       2.44       2.4       2.5         ATNT TO SCALE       2.26       2.03       1.36       0.83       1.37       1.37       1.42       0       0.83         1       2       3       4       5       6       7       8       9       10       11       12         2.45       2.44       2.46       2.5       2.42       2.46       2.44       2.5       2.42       2.46       2.44       2.5       2.42       2.46       2.44       2.5       2.41       2.5       2.42       2.46       2.44       2.5       2.42       2.46       2.44       2.5       2.43       2.41       2.														
PO Number       1       2       3       4       5       6       7       8       9       10       11       12         Direct ATNT(D)       2.41       2.39       2.41       2.45       2.37       2.41       2.39       2.4       2.42         Indirect ATNT(D)       2.95       2.96       2.98       2.9       2.98       2.96       2.94       2.9       2.93       2.96       2.94       2.4       2.45         Total-ATNT       2.46       2.44       2.46       2.5       2.42       2.46       2.44       2.4       2.5         ATNT TO SCALE       2.26       2.03       1.36       0.83       1.37       1.37       1.42       0       0.83         1       2       3       4       5       6       7       8       9       10       11       12         2.45       2.44       2.46       2.5       2.42       2.46       2.44       2.5       2.42       2.46       2.44       2.5       2.42       2.46       2.44       2.5       2.41       2.5       2.42       2.46       2.44       2.5       2.42       2.46       2.44       2.5       2.43       2.41       2.														
PO Number       1       2       3       4       5       6       7       8       9       10       11       12         Direct ATNT(D)       2.41       2.39       2.41       2.45       2.37       2.41       2.39       2.4       2.42         Indirect ATNT(D)       2.95       2.96       2.98       2.9       2.98       2.96       2.94       2.9       2.93       2.96       2.94       2.4       2.45         Total-ATNT       2.46       2.44       2.46       2.5       2.42       2.46       2.44       2.4       2.5         ATNT TO SCALE       2.26       2.03       1.36       0.83       1.37       1.37       1.42       0       0.83         1       2       3       4       5       6       7       8       9       10       11       12         2.45       2.44       2.46       2.5       2.42       2.46       2.44       2.5       2.42       2.46       2.44       2.5       2.42       2.46       2.44       2.5       2.41       2.5       2.42       2.46       2.44       2.5       2.42       2.46       2.44       2.5       2.43       2.41       2.														
Direct ATNT(D)       2.41       2.39       2.41       2.45       2.37       2.41       2.39       2.41       2.45         Indirect ATNT(D)       2.95       2.96       2.98       2.9       2.98       2.96       2.94       2.93       2.94       2.93       2.94       2.93       2.94       2.94       2.94       2.93       2.94       2.94       2.94       2.93       2.94       2.94       2.94       2.93       2.94       2.94       2.94       2.93       2.94       2.94       2.93       2.94       2.94       2.93       2.94       2.94       2.94       2.95         Total-ATNT       2.46       2.44       2.46       2.5       2.42       2.46       2.44       2.46       2.5       2.42       2.46       2.44       2.5       0.83         1       2       3       4       5       6       7       8       9       10       11       12       0.83         2       3       4       5       6       7       8       9       10       11       12       0.83         3       2.45       2.45       2.45       2.45       2.43       2.45       2.43       2.45       2.			) attain	nents o	f Sub: 1	L7CV64	Based o	n (AVE	RAGE-T	YPE-1)	Academ	nic Year	:2019-	20
Indirect ATNT(ID)       2.95       2.96       2.98       2.9       2.98       2.96       2.94       2.9         Total-ATNT       2.46       2.44       2.46       2.5       2.42       2.46       2.44       2.5         ATNT TO SCALE       2.26       2.03       1.36       0.83       1.37       1.37       1.42       0.83         3       2.45       2.44       2.46       2.5       2.42       2.46       2.44       2.5         4       0       0.83       1.37       1.37       1.42       0.83         3       2.45       2.44       2.46       2.5       2.42       2.46       2.44       2.5         1					3	4	5	6	7	8	9	10	11	12
Total-ATNT       2.46       2.44       2.46       2.5       2.42       2.46       2.44       2.5         ATNT TO SCALE       2.26       2.03       1.36       0.83       1.37       1.37       1.42       0.83         3       2.46       2.44       2.46       2.5       2.42       2.46       2.44       2.5         4       1.37       1.37       1.37       1.42       0.83         3       2.46       2.44       2.46       2.5       2.42       2.46       2.44       0.83         1       -       -       -       -       -       -       -       -       0.83       0.0       0       0       0.83         1       -       -       -       -       -       -       -       -       -       -       0.83         1       2       3       4       5       6       7       8       9       10       11       12         Summary of PSO attainments in Year:2019-20       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       - <t< td=""><td></td><td></td><td></td><td>2.39</td><td>2.41</td><td>2.45</td><td></td><td>2.37</td><td>2.41</td><td>2.39</td><td></td><td></td><td></td><td>2.45</td></t<>				2.39	2.41	2.45		2.37	2.41	2.39				2.45
ATNT TO SCALE       2.26       2.03       1.36       0.83       1.37       1.37       1.42       0.83         3       2.46       2.44       2.46       2.5       2.42       2.46       2.44       2.5         1       1       1       1       1       1       1       1       1       1.42       0.83         2       1       1       1       1       1       1       1       1.42       0.83         1       1       1       1       1       1       1       1.42       0.83         1       1       1       1       1       1       1.42       0.83       0.83         1       1       1       1       1       1.42       0.83       0.93       0.93       0.93       0.93         1       1       2       3       4       5       6       7       8       9       10       11       12       11       12       11       12       11       12       11       12       11       12       11       12       11       12       11       12       11       12       11       12       13       14       11<						2.9		2.98	2.96	2.94				2.9
3     2.45     2.44     2.46     2.5     2.42     2.46     2.44     2.5       1     <								2.42	2.46	2.44				2.5
2.46       2.42       2.46       2.44       2.5         2       1	ATN	IT TO SCALE	2.26	2.03	1.36	0.83		1.37	1.37	1.42				0.83
PO Attainment         Summary of PSO attainments in Year:2019-20         PSO Number       1       2       3       4         Direct ATNT(D)       2.4       2.39       1       0       0         Indirect ATNT(ID)       2.95       2.97       1       2       3       4         Struct ATNT       2.45       2.43       1       0       0       0         Indirect ATNT       2.45       2.43       1       0       0       0         Indirect ATNT       2.45       2.43       1       0       0       0       0         Indirect ATNT       2.45       2.43       0	And a second sec	2.46 2.4	4 2.46	2.5		2.42 2.	46 2.4		0		2.5			
Summary of PSO attainments in Year:2019-20       3       2.45       2.43         PSO Number       1       2       3       4         Direct ATNT(D)       2.4       2.39       1       0       0         Indirect ATNT(ID)       2.95       2.97       1       2       3       4         Solution of the second seco		1 2	3	4				9	10	11	12			
Summary of PSO attainments in Year:2019-20     2       PSO Number     1     2     3     4       Direct ATNT(D)     2.4     2.39     0     0       Indirect ATNT(ID)     2.95     2.97     1     2     3     4       Direct ATNT(ID)     2.45     2.43     0     0       Indirect ATNT     2.45     2.43     PSO Attainment					PC	) Attainn	nent				*			
Summary of PSO attainments in Year:2019-20     2       PSO Number     1     2     3     4       Direct ATNT(D)     2.4     2.39     0     0       Indirect ATNT(ID)     2.95     2.97     1     2     3     4       Direct ATNT(ID)     2.45     2.43     0     0       Indirect ATNT     2.45     2.43     PSO Attainment														
PSO Number         1         2         3         4         1         0         0           Direct ATNT(D)         2.4         2.39         0         0         0         0         0         0         0         0         0         0         0         0         0         0         1         2         3         4         PSO Attainment         PSO Attainment         0         1         2         3         4         PSO Attainment         PSO Attainment         0         0         0         0         0         0         0         0         0         0         0         1         2         3         4         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0	Sum	many of PSO of	tainmo	nts in V	021.201	9.20			2.43					
Direct ATNT(D)     2.4     2.39       Indirect ATNT(ID)     2.95     2.97       Total-ATNT     2.45     2.43				T				a fear	a sure of					
Indirect ATNT(ID)         2.95         2.97         1         2         3         4           Total-ATNT         2.45         2.43         PSO Attainment								and a second		0	0			
Total-ATNT 2.45 2.43 PSO Attainment							0		2	3	4			
											2			
			l	1	1				94000					

Vathore 1/8/2021

1/

						15/7	CO4
9	RO and Nano filtration process with merits and demerits.					15/7	CO4
10	RO and Nano filtration process with merits and demerits.						
Textbook: a	nd chapter :Water Treatment Engg	1	E				Taken
「「「「」」」 「「」」	Faculty: 0 18 2	<b>#HOURS</b>				Allotted	Taken
Signatures						10	10
Signatures	HoD: Hose Harris					10	
Remarks	Module - 4 in Completed	/				- Me	
	MODULE – 5					Date of	COs
Lecture #	Торіс		Moc Deli (PlsT	very		Delivery	Covered
		1	2	3	4		
1	Collection and Conveyance of water: Types of		~			22/4	CO4
	pumps with working principles and different.		1	-		29/1	CO4
2	numerical Problems.		~		1-	3/8	CO4
3	Design of the economical diameter for the rising main.		1			23/4	CO4
4	Pipe appurtenances, Valves, Fire hydrants				-		CO4
5	Pipe materials with their advantages and disadvantages. Factors affecting selection of pipe material		V			12/8	CO4
6	Methods: Gravity, Pumping and Combined gravity and pumping system.		~			2=/7	
7	Types of Distribution system.		~			27/7	CO4
8 * (	Types of Distribution system.		~			2+/7	CO4
9	Service reservoirs and their capacity determination plant	- eta	~			29/7	CO4
10	and distribution system with population forecasting for the given city.		~			10/8	CO4
Textbook :	and chapter : Water Treatment Engg						
I VALOUAL I	and chapter : Water Treatment Engg Faculty: Vatur 23 8 21	1			1	Allotted	Taken
Signatures			#HC	DUF	RS	10 10	
Remarks	HoD: Module - 5 10 Completed	d					

#### **Text Books:**

1. Howard S. Peavy, Donald R. Rowe, George T, Environmental Engineering - McGraw Hill International Edition. New York, 2000

2. S. K. Garg, Environmental Engineering vol-I, Water supply Engineering – M/s Khanna Publishers, New Delhi2010

3. B.C. Punmia and Ashok Jain, Environmental Engineering I-Water Supply Engineering, Laxmi Publications (P) Ltd., New Delhi2010.

### **Reference Books:**

1. CPHEEO Manual on water supply and treatment engineering. Ministry of Urban Development,

## Water Treatment

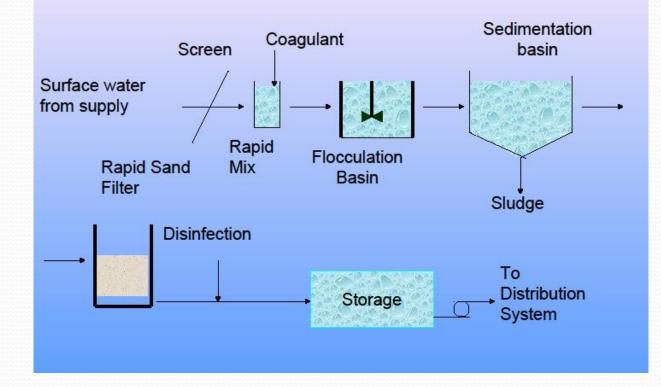
The complete process of removal of undesirable matter, in order to make the water acceptable for domestic or Industrial use, is commonly termed as treatment or purification of water.

## **Objectives of Treatment of Water**

- To make water odor & taste free
- To make it colorless
- To make the water safe & sparkling for drinking & domestic purposes
- To remove dissolved gases & turbidity
- To make it free from all objectionable impurities present in suspension, colloidal or dissolved form
- To remove harmful bacteria
- To remove hardness
- To make water suitable for a wide variety of industrial purposes.

## Water treatment flow chart

### Surface Water Treatment



Process	Impurities Removed
1 Screening	Adopted to remove floating matter
2 Aeration	Removes objectionable tastes, odor & dissolved gases like CO2, H2S. DO is increased. Removes Fe,Mn.
3 Plain Sedimentation	Removes settlable suspended impurities heavier than water
4 Sedimentation with Coagulation	Used to cause the sedimentation of colloidal & very fine suspended particles. some bacteria are also removed
5 Fitration	colloidal & very fine particles escaped from sendimentation are removed. Micro-organisms are removed to large extent.
6 Disinfection	All remaining organisms including pathogens are destroyed
7 Miscellaneous a) Softening b) Activated Carbon treatment	a) Hardness is removed b) Taste & Odour are removed.

## screening process

### The purpose of screening process

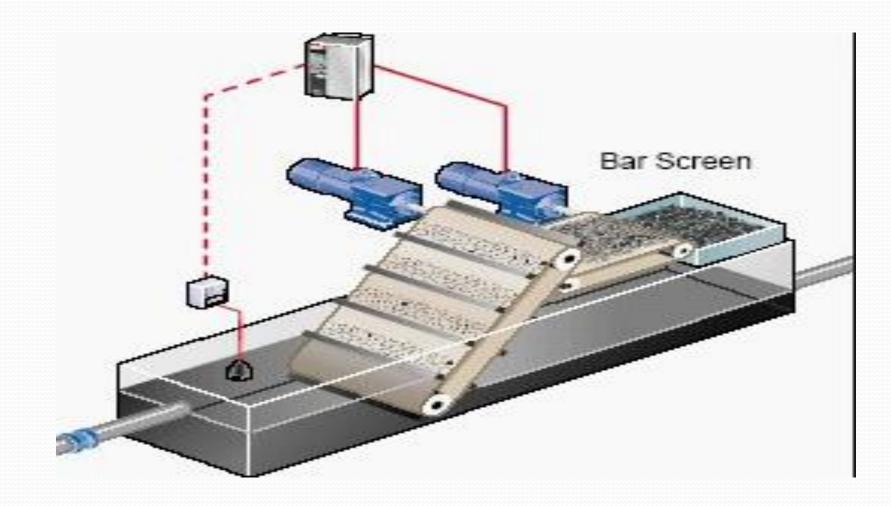
- Restrict the entry of suspended solids such as garbage in the water treatment plant.
- Prevent pump, pipe and equipment from clogging or damage.
- Launched a water course for the next process.

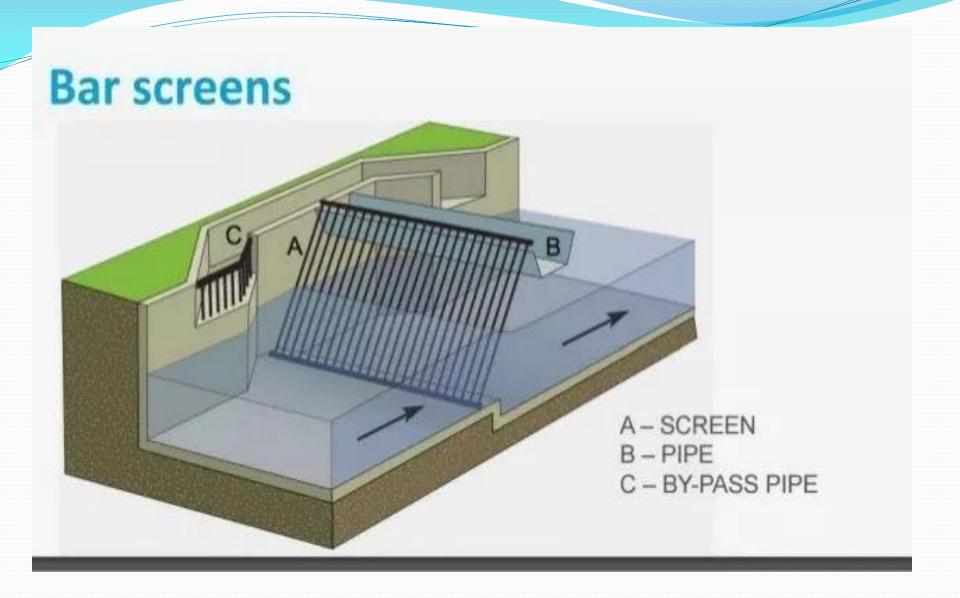
### • <u>Location :</u>

Screens are generally provided in front of the pumps or Intake works,

Types : 1.bar screen (coarse screen ) 2.fine screen 3.medium screen

## Bar screen





- It consist of parallel iron rods
- placed vertically or at slight slope, at about 2.5 to 5 cm apart.
- The course screens are also now normally kept inclined at about 45-60 degree







- Fine screens: They are usually made of perforated plates or wire mesh with opening not more than 6 mm square.
- Fine screens normally get clogged, and are to be cleaned frequently, hence avoded these days.



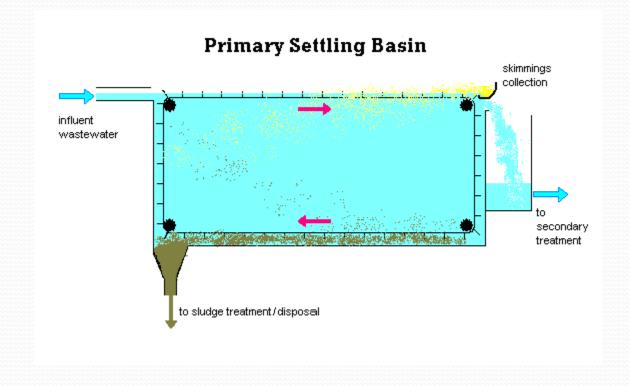


## Medium screen :

Similar to bar screen Diff – space b/w bars 2-5 cm Bars are usually 10mm thick

# **Plain Sedimentation**

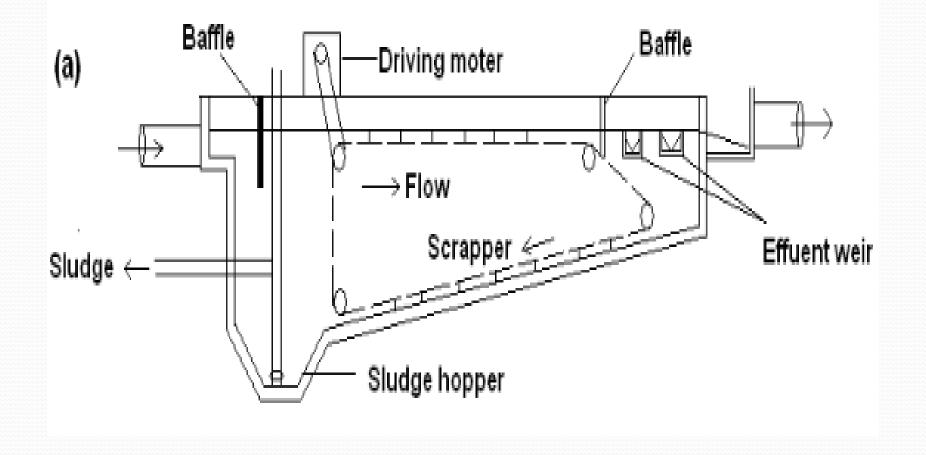
- 1. Most of suspended impurities present in water do have specific gravity greater than that of water.
- 2. In still water, these impurities will tend to settle down under gravity, although in normal raw supplies, they remain in suspension, because of turbulence in water.
- The basin in which the flow of the water is retarded is
- called the settling tank or sedimentation tank or sedimentation basin or clarifier
- Theoretical average time for which the water is detained in the tank is called the detention time.

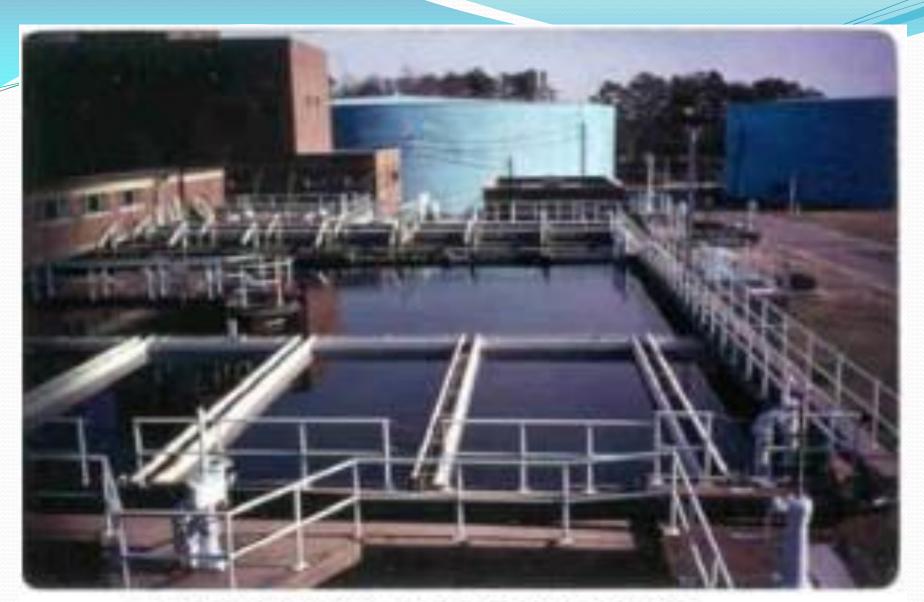


# **Types of Sedimentation Tank**

- 1. based on shape :
- a)rectangular b) circular c) hopper bottom tank
- 2. based on flow :
- a) Fill and draw type b) continuous type

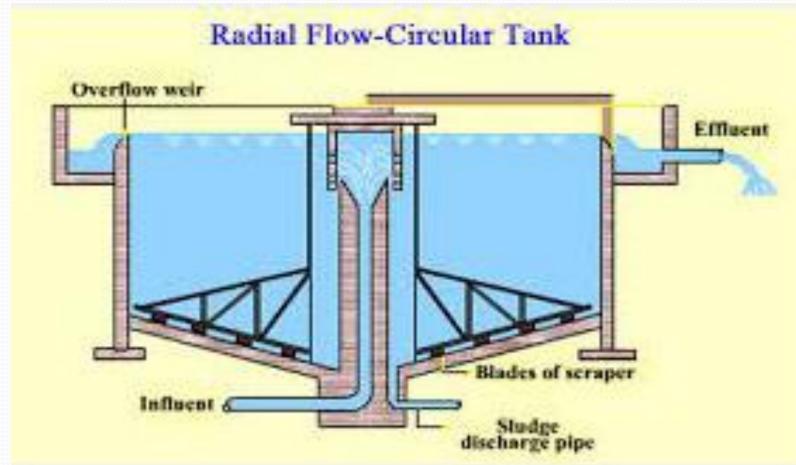
## Rectangular s.t



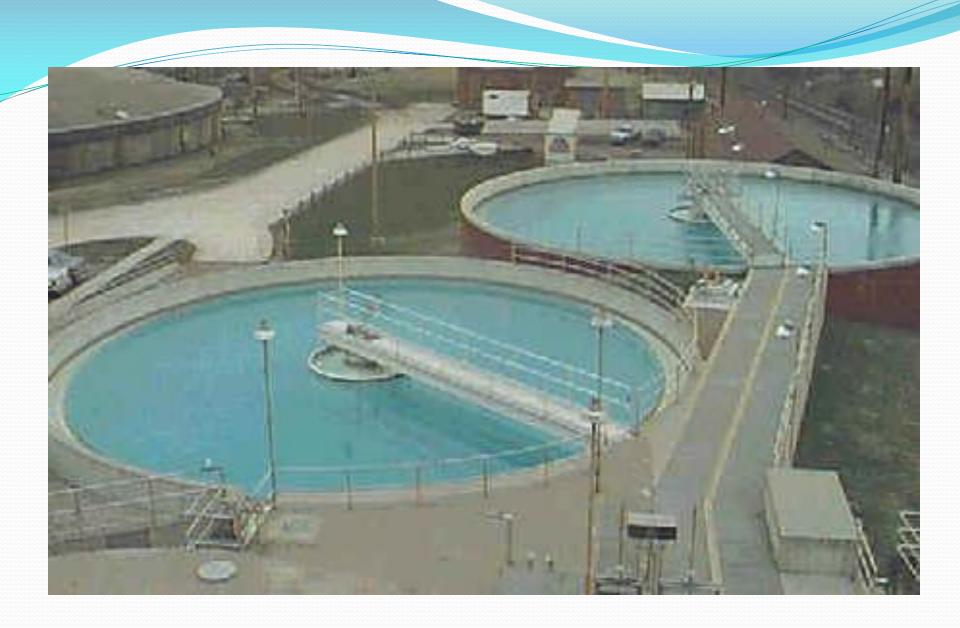


### A rectangular settling tank

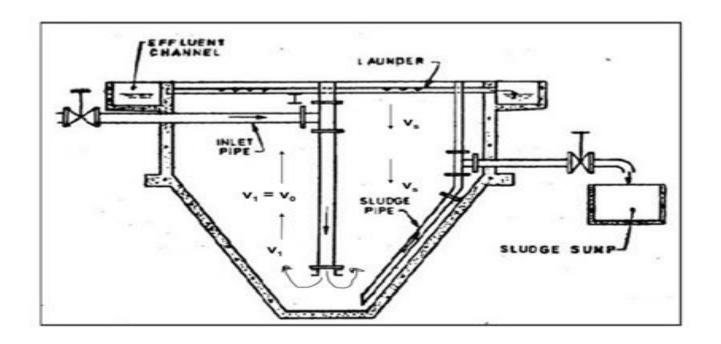
## Circular s.t







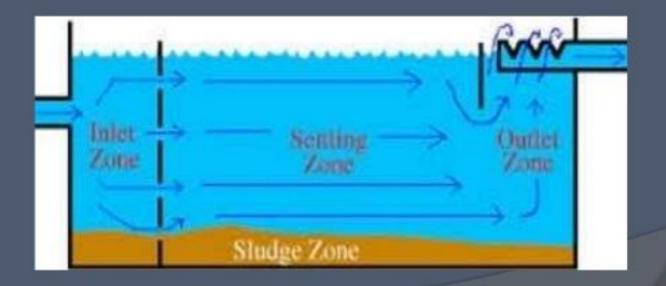
## hopper bottom tank



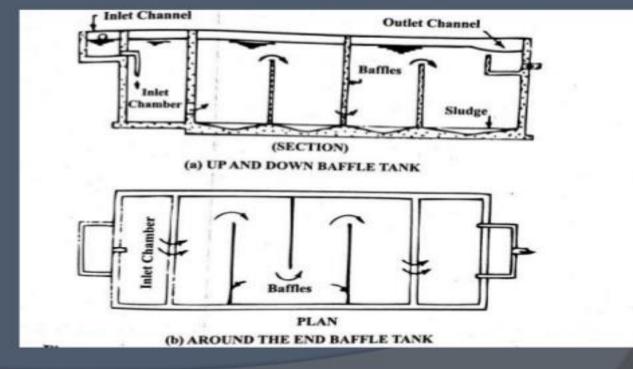
• based on flow :

a)Fill and draw typeb) continuous type

### Fill And Draw Type Tanks



### Continuous Flow Type Tanks





# Thank you no Auequ

Pollutron III BactenPologPcal tests changes in conditions load of & whenever deterporation in the qualitury of the water or even of themy should suggest any supple ed

comosem 2. B.O.D - 3t denotes the amount of oxygor meded by mecro-organismo for stabilezation de emposable, organe c'matter under aerobic condeteens. Hegh BOD means that there in les of oxygen to support lofe & endocates organic

IF chemecal tests 1. PH - Ret les a meanure of hydrogen pon concent -rotten, lit is any indecator of relative acedery or allealemetry of water. Low PH values helping effective chlurenation but cause problem with

preisence of living mécrocopie orgainsmis; or deaying organec matter including weeds, or industrial water containing ammonea, phenols halogens, hydrocanbones This taste is rompanted to fish, nondering term unpalet able

3. odour - odour & taste and associated with the



:

06#Form#03 - Rev. No. 00 Page

### Subject Title:

Question Number	Solution	Marks
	Surface area of Jank = <u>Capacity</u> depth = 138.88 m <sup>2</sup>	Allocated
	$B = 2L  2L \times L = 138.88$ $C/2 \times 2 \times 3 \times $	
	$SOR = \frac{208,31}{138.8}$	
	$= \frac{1.49}{m^2} \frac{m^2}{hr}.$	
	B = 4.16  m	
	Hatinovi doment - 29/6	