

**SAMANTA CHANDRASEKHAR INSTITUTE OF TECHNOLOGY & MANAGEMENT,
SEMILIGUDA**

1st INTERNAL EXAMINATION
Diploma 5th Semester (Civil)
Subject: WS&WWE

Time:1 hr 30 minutes

Total Marks:20

(Figures to the right-hand side indicates marks)

PART-A

Q1. Answer the following question. (2x5=10)

- a) Write down the necessity of treated water supply?
- b) Write down the formula for per capital demand?
- c) What do you mean by sanitary engineering?
- d) What are the different types of demand ?
- e) What are the factor affecting in population?

PART-B

Q2. Answer any two question. (5X2=10)

- a) What are the factor affecting water demand and explain briefly about it?
- b) The following data have been noted from the census depth.

<u>Year</u>	<u>Population</u>
1940	8000
1950	12000
1960	17000
1970	22500

Calculate the probable population in the year 1980,1990 and 2000 in arithmetical increase and geometrical increase method?

- c) What are various test to determine the quantity of water and briefly explain the physical test?

No. AB/ 1665



**SAMANTA CHANDRASEKHAR INSTITUTE
OF TECHNOLOGY AND MANAGEMENT
SEMILIGUDA - 764 036**

Internal Examination 5th Semester/Class
Name Naveen Gurtha Branch Civil engg
Roll No. F19030001013 Registration No. F19030001013
Subject WIC & WWE Date 23/12/21
No. of Addl. Sheets used _____

18 1/2 = 19
20
Manisha 23/12/2021

Signature of the Invigilator

USE BOTH SIDE OF PAPER

MARKS OBTAINED

<u>Question No.</u>	<u>Marks</u>
1. 1(a)	1 1/2 marks
2. 1(b)	2 marks
3. 1(c)	2 marks
4. 1(d)	2 marks
5. 1(e)	1 mark

<u>Question No.</u>	<u>Marks</u>
6. 2(a)	5 marks
7. 2(b)	6 marks
8.	
9.	
10.	

Total : 18 1/2 marks

Manisha
Signature of the Examiner

Date 23/12/2021

- I/ Answer the following
- Write down the necessity of increased water supply?
 - Write down the formula for per capital demand?
 - What do you mean by Sanitary engineering?
 - What are the different types of demand?
 - What are the factors affecting in population?
- II Answer any two.

a) What are the factors affecting water demand & explain briefly about it?

b) The following data have been noted from the census depth.

<u>years</u>	<u>population</u>
1940	8000
1950	10000
1960	17000
1970	22500

calculate the probable population in the years 1980 1990 & 2000 by arithmetic increase and geometrical increase method?

- c) What are various test to determine the quantity of water & briefly explain the physical test?
- b) The following data have been noted from the census depth.
- d) Determine

$$P_n = P + n \cdot c$$

arithmetic method

<u>years</u>	<u>population</u>
1940	8000
1950	12000
1960	17000
1970	22500

population increase

4000

5000

5500

$$\text{total} = 14500$$

$$\frac{14500}{3} = 4833$$

year population increased

$$1980 \quad 22500 + 1 \times 4.833 = 22584$$

$$1990 \quad 22584 + 3 \times 4.833 = 22578$$

$$2000 \quad 22578 + 4 \times 4.833 = 22537$$

geometrical increase method

$$P_n = P \left(1 + \frac{Ig}{100} \right)$$

year population population increased population

$$1940 \quad 8000 \quad 9000 \quad \text{percentage}$$

$$1950 \quad 12000 \quad 5000 \quad \text{increase.}$$

$$1960 \quad 17000 \quad 5500 \quad \frac{5000}{12000} \times 100 = 33\%$$

$$1970 \quad 22500 \quad 5500 \quad \frac{5000}{17000} \times 100 = 29.41\%$$

(5)

$$\frac{5500}{22500} \times 100 = 24.44$$

$$\text{total} = \frac{14500}{3} = 4833$$

$$\frac{33 + 29.41 + 24.44}{3} = 28.95$$

year population

$$1980 \quad 22500 + \left(1 + \frac{4.833}{100} \right) = 22509$$

$$1990 \quad 22509 + \left(1 + \frac{4.833}{100} \right) = 22505$$

$$2000 \quad 22505 + \left(1 + \frac{4.833}{100} \right) = 22509$$

- I (Ans) \rightarrow the sanitation of the area is considerably improved by the adequate water supply.
- \rightarrow there is less chance of water born diseases.
- \rightarrow the public ~~sanitation~~ generally get purified, water & \rightarrow the water is used for various purpose.
- I (Ans) \rightarrow In community water is used for various purpose for the purpose of estimation of total requirement of water.

then per capital demands

$$\text{per capital demand} = \frac{9}{P \times 365} \text{ litres/day}$$

(2)

- I (Ans) the following list 5 types of demand.

- (i) domestic water demand
- (ii) commercial & industrial demand
- (iii) fire demand
- (iv) demand for public use
- (v) compensate losses demand.

I (Ans) Sanitary engineering - also known as public health engineering or waste water engineering is the application of engineering methods to improve sanitation of human communities, primarily by providing the removal and disposal of human waste and in addition to the supply of safe potable water.

1) When demographers attempt to forecast changes in the size of a population, they typically focus on four main factors: fertility rates, mortality rates, life expectancies, the initial age profile of the population (whether it is relatively old or relatively young to begin with), and migration.

①

Major factor affecting the water demand

Following are the main factors which affect the per capita demand of the city.

① Climatic condition :- the required of water in summers is more than winters. So the rate of demands more in summer.

② Size of the community :- the per capita demand of the town will increase with the size of the town because more water will be required in street washing.

③ Living standard of the people :- the per capita demand of the town increase with the standard of living of the people. The people will start use of air conditioners, room coolers.

④ Industrial & commercial activities :-

As the quantity of water required in certain industries is more than the domestic demand their presence in the town will enormously increase the per capita demand of the town.

(V) pressure in the distribution system
→ the rate of water consumption increases with the increase in the pressure at the building & even with the required pressure at the farthest point, the consumption of water will automatically increase.

(VI) system of levitation:-

the per ~~capita~~ demand of the town having water carriage system will be more than the town where this system is not being used.

(VII) cost of water:

the cost of water directly affects its demand if the water cost is more, less a quantity of water will be used by the people as compared when the cost is low.

Q5

**SAMANTA CHANDRASEKHAR INSTITUTE OF TECHNOLOGY & MANAGEMENT,
SEMILIGUDA**

2nd INTERNAL EXAMINATION
Diploma 5th Semester (Civil)
Subject: WS&WWE

Time:1 hr 30 minutes

Total Marks:20

(Figures to the right-hand side indicates marks)

PART-A

Q1. Answer any five question. (2x5=10)

- a) What is design period in designing water supply scheme?
- b) What is yield of a well?
- c) What is self cleaning velocity?
- d) What do you mean by hardness of water?
- e) What is sewage?

OR

Mention the type of distribution system in the pipeline ?

PART-B

Q2. Answer the following question. (5x2=10)

- a) Explain the different types of water demand?
- b) Write down the different types of sewerage system and discuss the merits and demerits of each system.

OR

Explain with neat sketch the working operation of a "trickling filter"?



**SAMANTA CHANDRASEKHAR INSTITUTE
OF TECHNOLOGY AND MANAGEMENT**
SEMILIGUDA - 764 036

9th Internal Examination 5th Semester/Class
 Name Aleci Guntha Branch civil Engg
 Roll No. F1903001/013 Registration No. F1903001/013
 Subject WIS & WPF Date 21/02/2022
 No. of Addl. Sheets used _____

20/20 Manjisha 25/02/2022

Signature of the Invigilator

USE BOTH SIDE OF PAPER

MARKS OBTAINED

<u>Question No.</u>	<u>Marks</u>
1. 1(a)	2marks
2. 1(b)	2marks
3. 1(c)	2marks
4. 1(d)	2marks
5. 1(e)	2marks

<u>Question No.</u>	<u>Marks</u>
6. 2(a)	5marks
7. 2(b)	5marks
8.	
9.	
10.	

Total : _____

Manjisha
Signature of the Examiner
 Date 25/02/2022

(1) Answer any five questions:- (5x2 = 10 marks)

- What is design period in designing water supply scheme?
- What is yield of a well?
- What is self cleaning velocity?
- What do you mean by hardness of water?
- What is sewerage?

Ques
Mention the types of distribution system in the pipeline?

2 Answer the following :- (2x5 = 10 marks)

- Explain the different types of water demand?
- Write down different types of sewerage system and discuss the merits and demerits of each system.

Ques
Explain with neat sketch the working operation of a forekilling filter?

(b) Ans/02 Yield of well is the rate at which water percolate into the well under the same maximum head or critical depression head. (2)

(i) It is the volume of ground water extracted by gravity drainage from a saturated water bearing material.

(ii) It is the property of water which prevents the latering of the soil. It is caused due to the presence of carbonates & sulphates of calcium in the water. Sometimes the presence of chlorides & nitrates of calcium & magnesium also causes hardness in the water.

(a) After the future period for which a provision is made in the water supply scheme is known as the design period.

The following useful life of the component.

considering obsolescence water, fear etc. (2)

(e) Ans// the faecal sewage is used to indicate the liquid waste such as sewage, discharge from latrine animals etc. industrial waste and storm water. These are various types of sewage, such as:

- (i) combined sewage
- (ii) Faecal or faecal sewage (2)
- (iii) Domestic or sanitary sewage
- (iv) Fresh sewage
- (v) Septic sewage.

(c) Ans// (i) the lifting of sewers can be avoided by generating such high velocities that would not permit the solid to settle down i.e. the velocity should be such as to cause automatic self cleaning effect such as self cleaning velocity i.e. the velocity which will even scour the deposited particles of a given size must be developed in the sewers. (2)

2) Answer the following :- (2x5=10 marks)

(a) Ans// the demand of water for various purpose is divided under 6 categories.

- (i) domestic purpose
- (ii) public purpose
- (iii) industrial purpose
- (iv) Trade purpose
- (v) cool and waste
- (vi) fire demand

(i) domestic purpose:- the quantity of water required for domestic purpose can be sub-divided as follows:

(a) drinking.

- A human body contains about 70% of water. The convection of water by a man is required for various physiological processes.

- under normal condition this requirement is 2 litres per day
- (b) Cooking - 5 litres per head per day
- (c) Bathing
 - for Indian bath the quantity may be assumed as 30-40 litres.
 - for tub bath - 80-80 litres may be taken
- (d) washing hand and face
 - 5-10 litres per head per day.
- (e) Household sanitary purpose
 - it may be assumed to be about 50-60 litres per head per day
- (f) public purpose 5
- (g) Road washing
 - for this purpose the water requirement 5 litres per head per day
- (h) Sanitary purpose
 - water requirement for this purpose will about 2-3 litres per head per day
- (i) decorative purpose
 - it depends upon the decorative fountains & fountains and swimming pools.
- (j) Industrial purpose
- (k) Factories -
 - product water demand per kg product in litres

S.I. No.	Product	Water demand per kg Product in litres
01	Aluminium	1350
02	glass	70
03	paper	160-175
04	steel	45-60
05	sugar	9
- (l) power station / power plants

- A huge quantity will be required for working of power station depending upon the size

(iv) Trade purpose.

- some trade such as doctors-hotel, laundries-motors garage, restaurant, cinema hall, etc. are require a large quantity of water are always have of about (5-25 l/sec.)

(v) Loss and Waste:

- the quantities of water require on this category is sometimes termed as unaccounted requirement - in India 20-60% of total demand comes under this category.

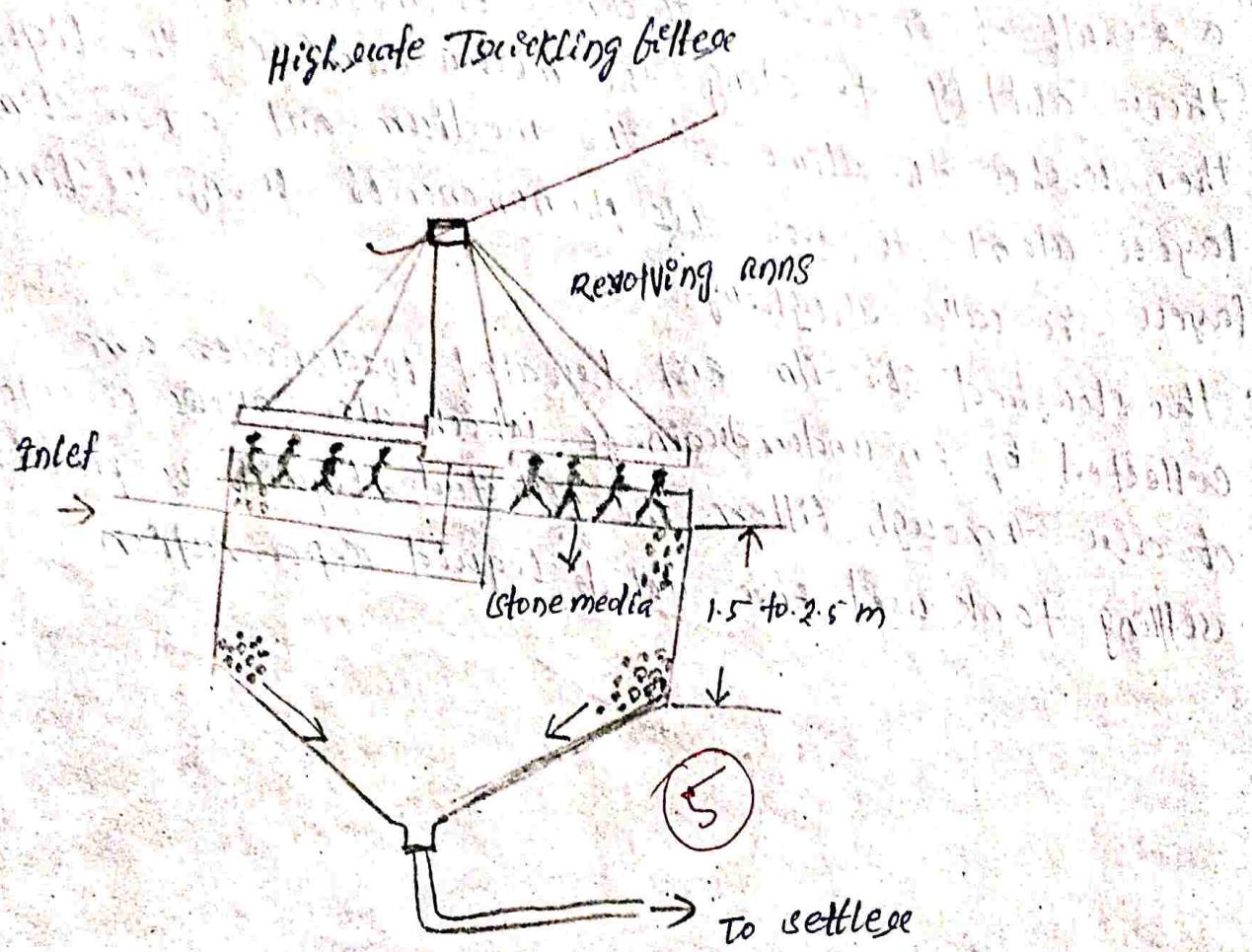
(vi) fire demand:

- usually fire occur in factories and offices the quantity of water required for fighting purpose should be essentially available and need to always kept some in the storage reservoirs.

~~Ans~~ A trickling filter is a type of wastewater treatment system first used by didder and cloes of consists of a fixed bed of rocks, lava, coke, gravel, slag, polyurethane foam, agapanthus peat moss, ceramic or plastic media over which sewage or other wastewater flow downward and causes a layer of microbial slime (biofilm) to grow covering the bed of media aerobic conditions are maintained by the bed of media aeration is done by forced air blowing splashing-diffusion and eddies by natural convection of air through the bed or natural porosity.

if the filter medium is ~~working~~ working trickling filter is an attached growth process i.e process in which microorganisms responsible for treatment are attached to an inert packing material packing

material used in attached growth process includes rock gravel, clay, coal, sand, and a wide range of plastic and other synthetic materials.



process description

- the wastewater in trickling filter is distributed over the flat area of a vessel containing non-submerged packing material
- Air circulation in the void space by either natural draft or blow. provides oxygen for the microorganisms growing as an attached biomass.
- during operation, the organic material present in the wastewater is metabolized by the biomass attached to the medium. the biological slime grows in thickness as the organic matter absorbed from the following wastewater is synthesized into new cellular material
- the thickness of the aerobic layers is limited by the depth of penetration of oxygen into the microbial layer.

- the microorganism near the medium base center the endogenous phase as the substrate is metabolised before it can reach the micro-organism near the medium base as a result of increased thickness of the slime layer and lose their ability to cling the media surface. the liquid then washes the slime off the medium and a new slime layer starts to grow. this phenomenon of losing the slime layer is called sloughing.
- the sloughed off film and treated wastewater are collected by an underdrainage which also allows circulation of air through filter. the collected liquid is passed to a settling tank used for solid liquid separation

~~Manjula~~

settler