



CIVIL ENGINEERING



DDA JE 2022

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300
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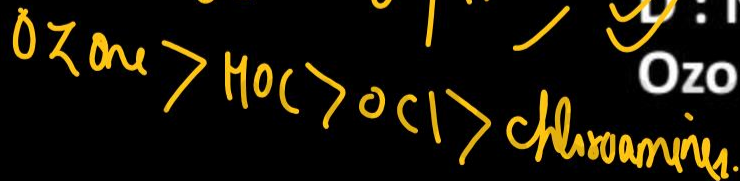
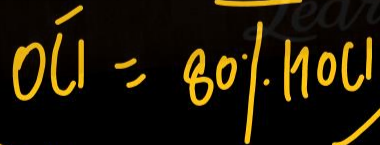
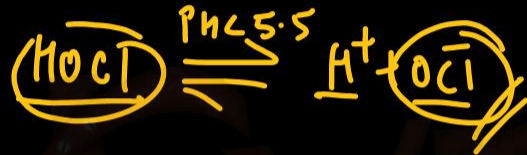


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Q : 60) Order 4 disinfectants in increasing order of their disinfection power?

A : Ozone < HOCl < Monochloramine < NCl_3
Coliform Bacteria

B : Ozone < NCl_3 < Monochloramine < HOCl

C : NCl_3 < HOCl < Monochloramine < Ozone

D : NCl_3 < Monochloramine < HOCl < Ozone

(D)



$$\boxed{\text{OCl}^- = 0.8 \text{HOCl}}$$



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Q : 61) The efficiency of disinfection by chlorine in water treatment increase by

A : Decrease in time of contact

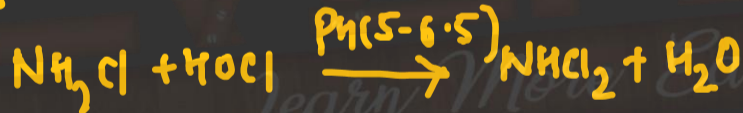
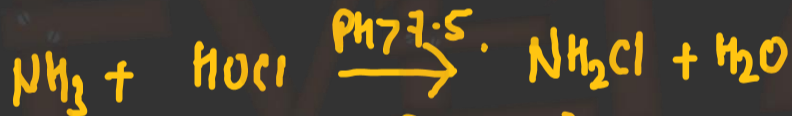
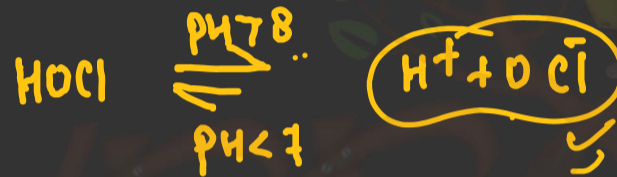
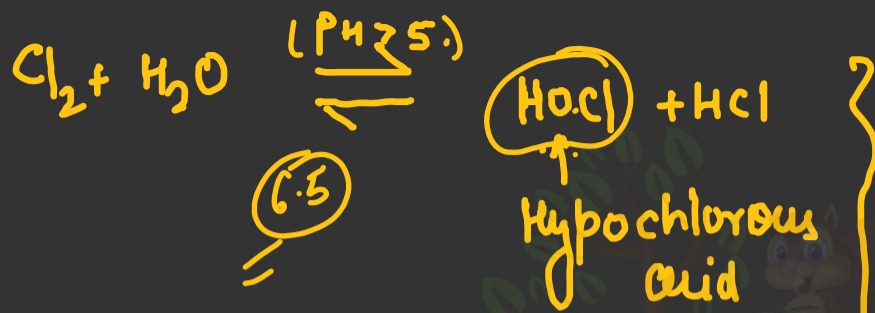
B : Decrease in temperature of water

C : Increase in temperature of water

D : Pre-chlorination

D.

$pH < 7$



Q : 62) What is food to micro-organism ratio in an aeration tank having following data?

mixed liquor suspended solid

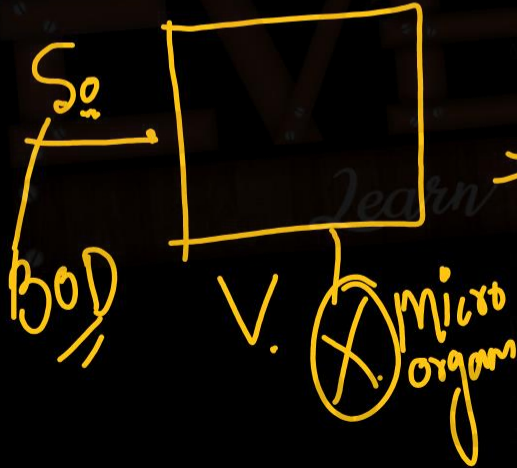
Flow = 1 MLD, MLSS = 2000 mg/L

Influent BOD₅ – 200 mg/L

*MLSS
MLVSS*

Volume of aeration tank = 500 m³

$$\frac{\text{Food}}{\text{mass}} = \frac{Q_0 S_0}{V X_0}$$



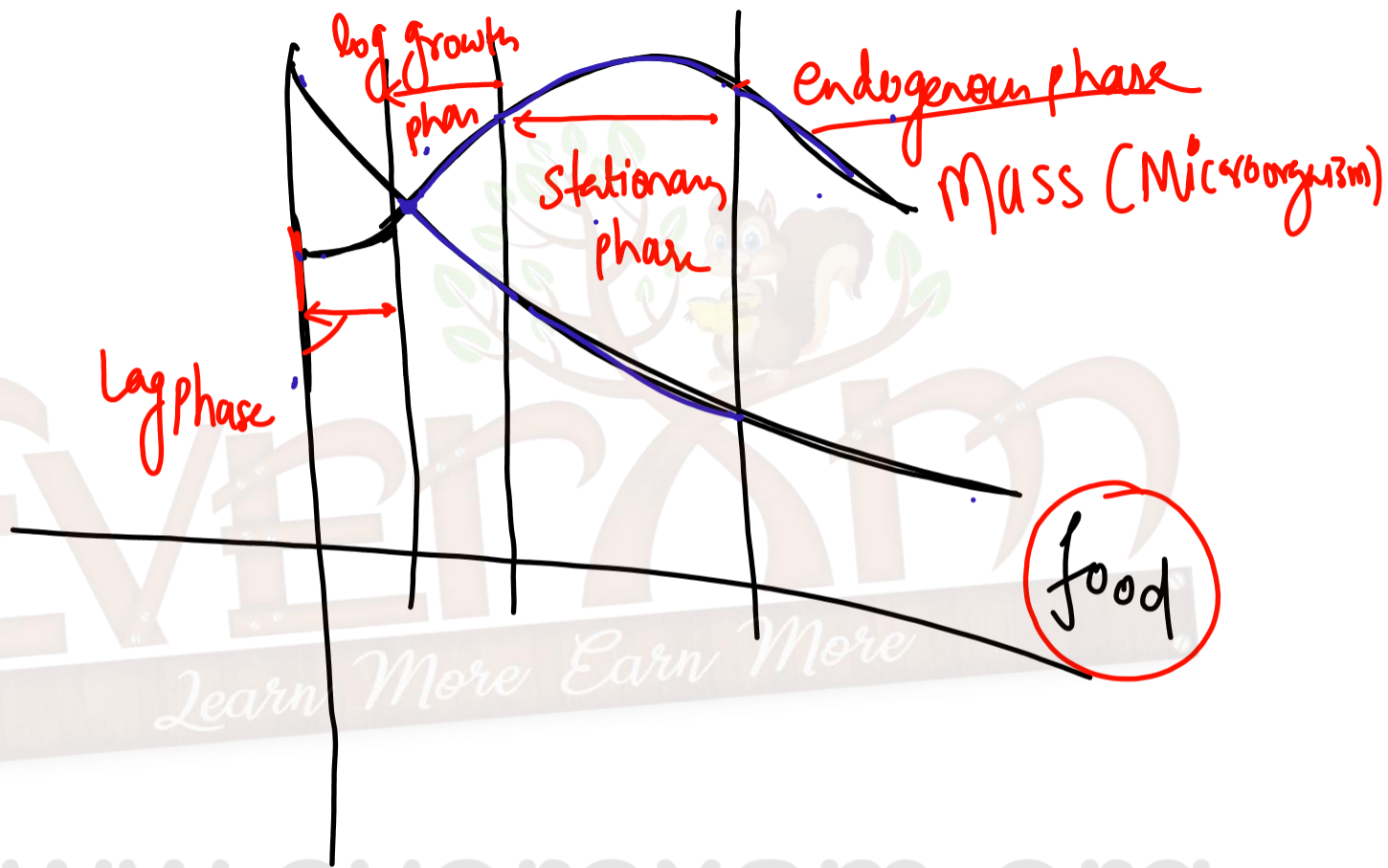
~~A : 0.20~~

B : 5.00

C : 0.80

D : 1.25

$$\frac{1 \times 10^6 \times 10^{-3} \times 200}{500 \times 2000} = \frac{10^5}{5000} = \frac{1}{5} = 0.20$$



Lime Soda
Procen.

$\text{CaCO}_3(\text{ppt})$

Re carbonation

Q : 63) The purpose of re-carbonation after water softening by the lime-soda process is the

A : Removal of excess soda from the water

B : Removal of non-carbonate hardness in the water

C : Recovery of lime from the water

☒ D : Conversion of precipitates to soluble forms in the water (Re carbonation)



Q : 64) Which type of drainage system consists of laterals and sub-mains in which laterals are provided only one side of a sub-main?

A : Double main system

☒ B : Grid iron layout (*Rebicular system*)

C : Herring bone pattern

D : Natural system

Q : 65) Concrete pipes are jointed by

A : Collar joint

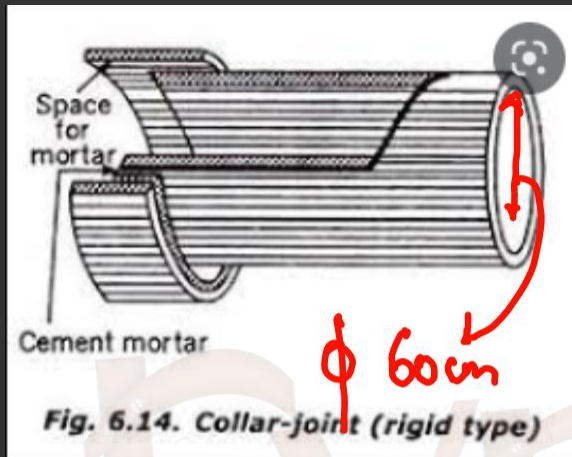
B : Flush joint

C : Hinge joint *← Steel Structure*

~~D : (a) or (b)~~

D

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glush joint

Q : 66) The type of valve which is provided to regulate the flow of water through the pipelines is

A : Air valve

B : Sluice valve

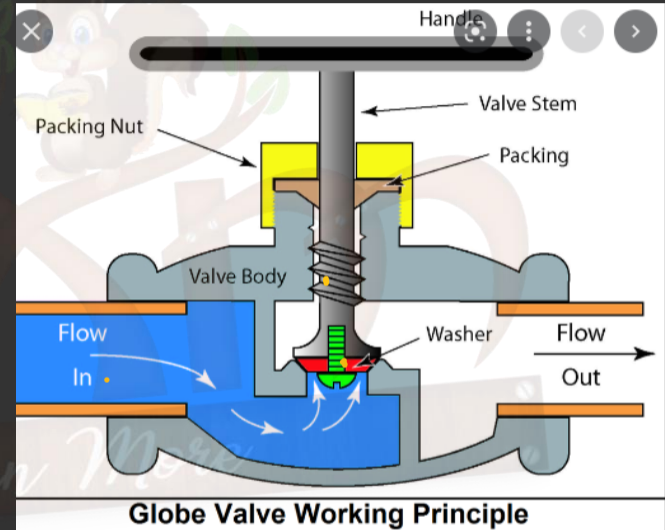
C : Check valve

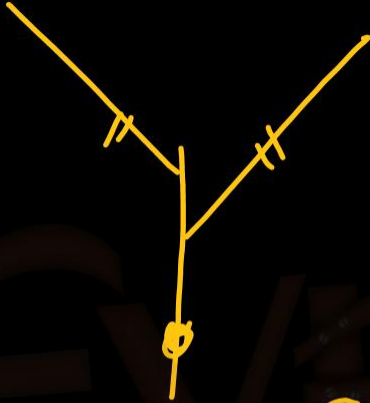
D : Globe valve

Regulate

Only one direction

Globe valves, so-called because of their outside shape, are widely used in plant piping. They are suitable for manual and automatic operation. Unlike the gate valve, globe valve can be used for regulating flow or pressures as well as complete shutoff of flow.





Q : 67) The four major water supply distribution systems are

A : Dead end, trees, grid iron and reticulation

B : Dead end, trees, grid iron and circular

~~C : Trees, grid iron ring and radial~~

D : Tree, reticulation, circular and ring

(C)

(C)

Q : 68) Ferrule is one of the important appurtenances installed in

A : Combined sewerage system

~~B : Water distribution system~~

C : House drainage system

D : Storm sewerage system

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1) Ferrules \rightarrow made by gun metal
Size of dia (10-50)mm

2) Goose Neck
L 75cm, made by lead

3) Service pipe \Rightarrow made by G.I
 ϕ (12-50)mm

4) Stop cock

5) Water Meter

(F)(G)(S)(W)

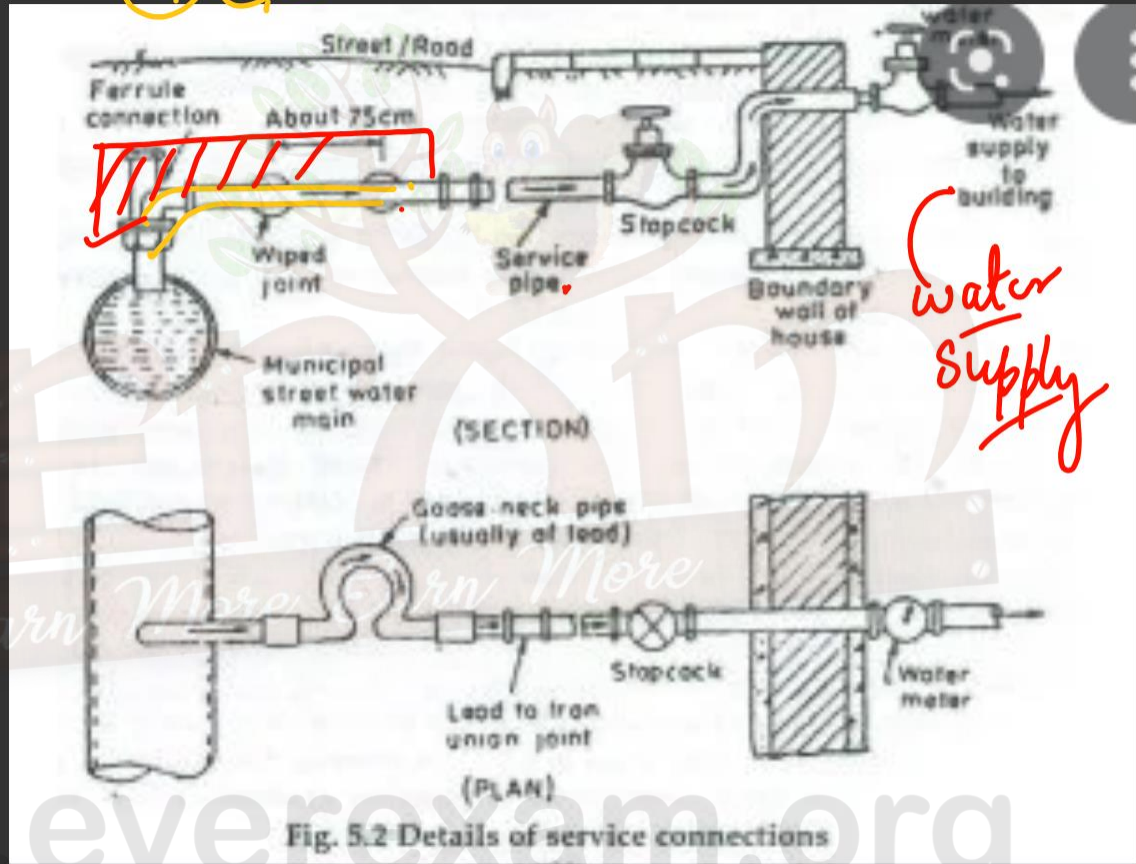


Fig. 5.2 Details of service connections

Q : 69) Out of the following distribution systems, which have the least number of cut-off valves?

A : Ring system

B : Radial system

C : Dead end system

D : Grid iron system

min cut off valves

Q : 70) A goose neck is

(A)

A : A bent flexible pipe provided between ferrule and stop-cock

B : A T-shaped brass length between water meter and ferrule

C : A straight G.I. pipe, service pipe and stop-cock

D : A bent rigid pipe between service pipe and water meter

Q : 71) What is the use of sonoscope?

A : Checking the accuracy of water meters

B : Regulating the fire hydrants

C : As a replacement of venturi meter for discharge measurement

D : Detection of leakage in underground water mains

Q : 72) For the same solid content, if the quantity of sludge with moisture content of 98% is X, then the quantity of sludge with moisture content of 96% will be

$$X(100-98) = Y(100-96)\%$$

$$X(2) = Y(4)$$

$$X = 2Y$$

$$Y = X/2$$

A : X/4

~~B : X/2~~ (B)

C : X

D : 2X

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Q : 73) The phenomenon by virtue of which soil pores gets clogged with sewage matter is called

A : Sewage farming

B : Sewage bulking

☒ C : Sewage sickness

D : Sewage irrigation

Q : 74) The minimum velocity of flow in a sewer should be ideally

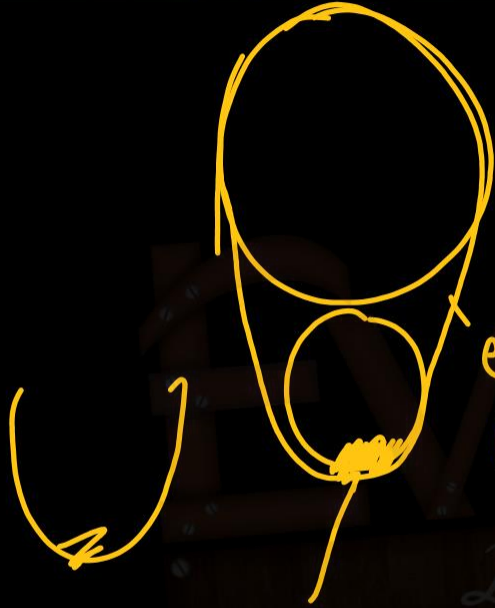
A.

~~A : Equal to self-cleansing velocity~~

B : Equal to non-scouring velocity

C : Less than self cleaning velocity

D : More than non-scouring velocity



egg
shape

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Q : 75) The proportion of solids in sewage is about:

A : 2.55% or more

B : 1% or more

☒ C : 0.1% or less

D : Zero

99.90% (A)

(C)

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Important points:

Sewage with a BOD value of 300 ppm or above and suspended solids content 500 mg/l or more is called as strong sewage.

Sewage with a BOD of 100 ppm or less and suspended solids content 100 mg/l or less is called as weak sewage.

Sewage is a waste water from a community, containing solid and liquid excreta, derived from houses, streets, factories and industries.

It contains 99.9 percent water and **0.1 percent solids** (partly organic and partly inorganic).

The strength of the sewage may be expressed in terms of Biochemical oxygen demand (BOD), Chemical oxygen demand (COD) and Suspended solids.

Q : 76) The BOD removal efficiency, during primary treatment, under normal conditions are:

A : 65%

B : 55%

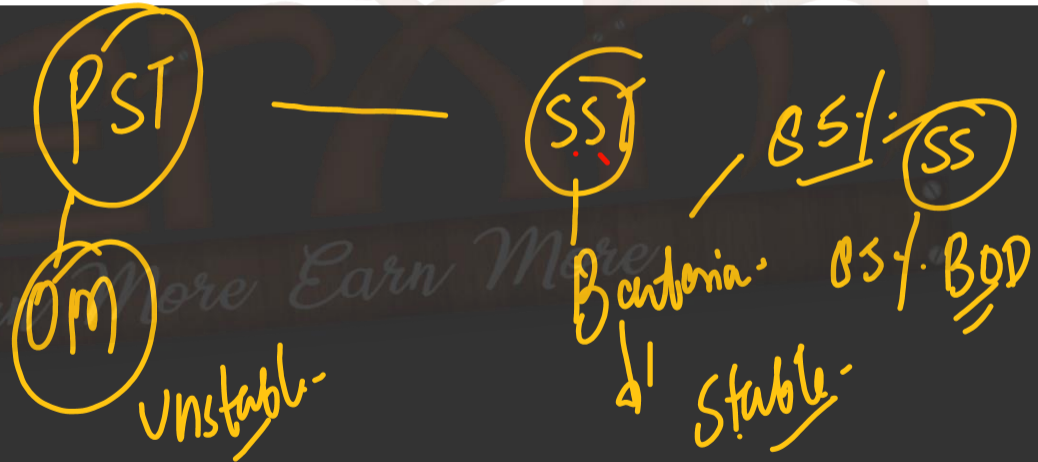
C : 85%

D : 30%

D

(BOD) Removal / Suspended particle

Primary treatment removes about 60 percent of total suspended solids and **about 35 percent** of BOD; dissolved impurities are not removed. It is usually used as a first step before secondary treatment. Secondary treatment removes more than 85 percent of both suspended solids and BOD....



$$\text{Relatn} = \frac{O_2}{O_2(BOD_{5\text{ day } 20^\circ\text{C}})}$$
stability

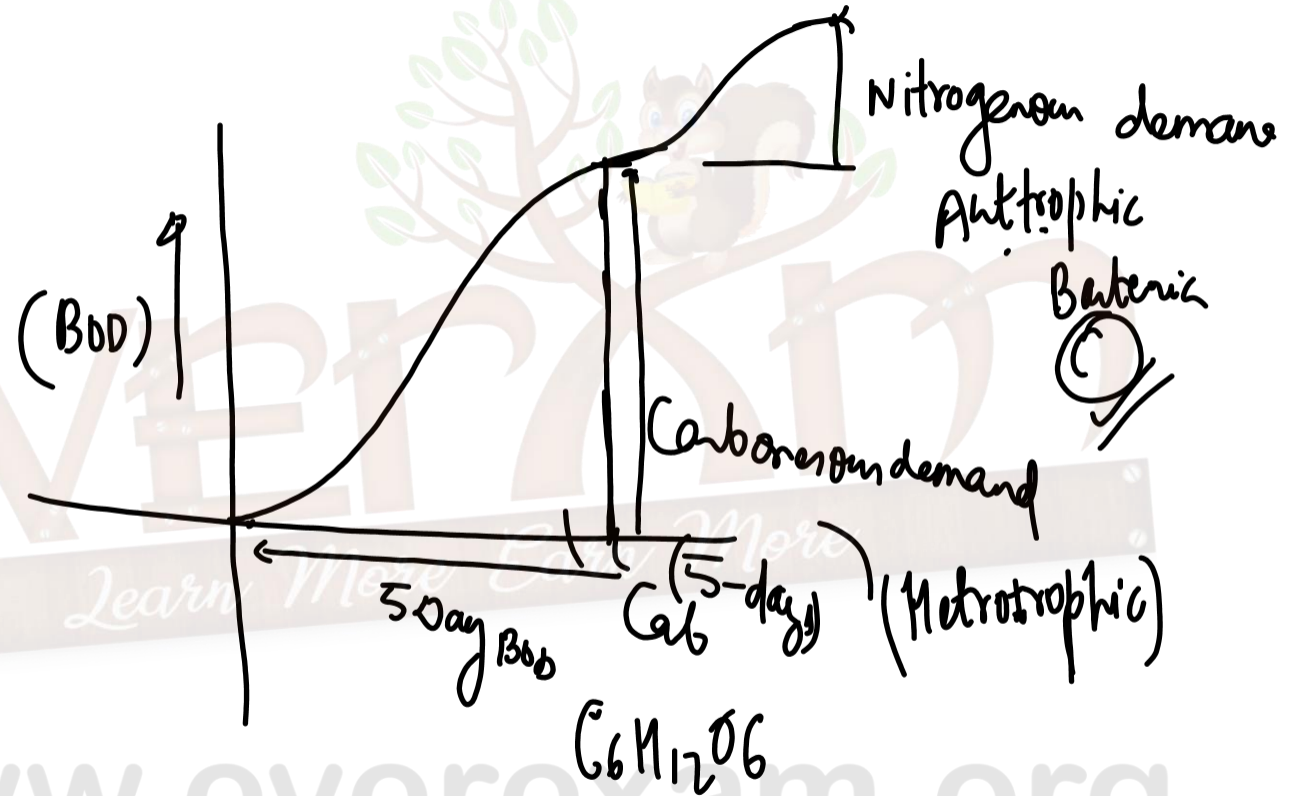
Q : 77) The ratio of available oxygen to the required oxygen satisfying the first biochemical oxygen demand is known as

A : Total organic carbon

B : Total oxygen demand

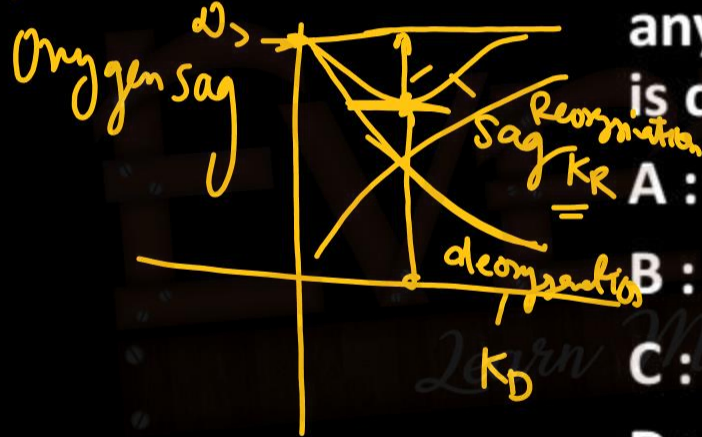
☒ C : Relative stability

D : Theoretical oxygen demand



Q : 78) The difference between saturated dissolved oxygen content and the actual dissolved oxygen content in the stream at any point during self-purification process is called:

$$D_o = D_s - D_t$$



A : Oxygen sag

B : Aeration

C : Re-oxygenation

D : Biochemical oxygen demand

(A)

Q : 79) According to IS 3306, the tolerance limits for industrial effluents discharged into public sewer should have effluent temperature not exceeding

A : 10°C

B : 25°C

C : 30°C

D : 45°C

D

150mm Sewer

gradient

Q : 80) The gradient required to generate self-cleaning velocity case 150 mm diameter sewer is

A : 1 in 300

B : 1 in 200

C : 1 in 150

① ~~D : 1 in 100~~

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| Nature of Particle in the Sewage | Self Cleaning Velocity (m/sec) |
|----------------------------------|--------------------------------|
| 1. Rounded pebbles (12 to 15 mm) | 0.5 – 0.6 |
| 2. Fine gravel | 0.3 |
| 3. Coarse Sand | 0.2 |
| 4. Angular stone | 1.0 |
| 5. Fine sand and clay | 0.15 |
| 6. Fine clay and silt | 0.075 |

| Diameter of the Sewer | Self Cleaning Velocity |
|-----------------------|------------------------|
| 1. 15 to 25 cm | 1.00 m/sec <i>lx.</i> |
| 2. 30 to 60 cm | 0.75 m/sec |
| 3. Above 60 cm | 0.60 m/sec |

Storm Sewer.

qti { isolation

Combined Sewer

Time Concentration



Catchment Outlet

Q : 81) In the design of storm sewers, "Time of concentration" is relevant to determine the

A: Rainfall intensity

B : Velocity in the sewer

C : Time of travel

D : Area served by the sewer

A.

Storm water drainage

$$Q = C i A$$

Q : peak Rate of runoff (m^3/sec)

$$C = \frac{\text{Runoff}}{\text{Rainfall}}$$

$$Q = \frac{2}{1 + T_c} \left(\frac{2}{1 + T_c} \right)$$

T_c = time Concentration
 i = Design intensity
of Rainfall

A = Catchment area.

Q : 82) Sewer that receives sewage from the collecting systems and conducts it to a point of final discharge or to disposal plant is called.....

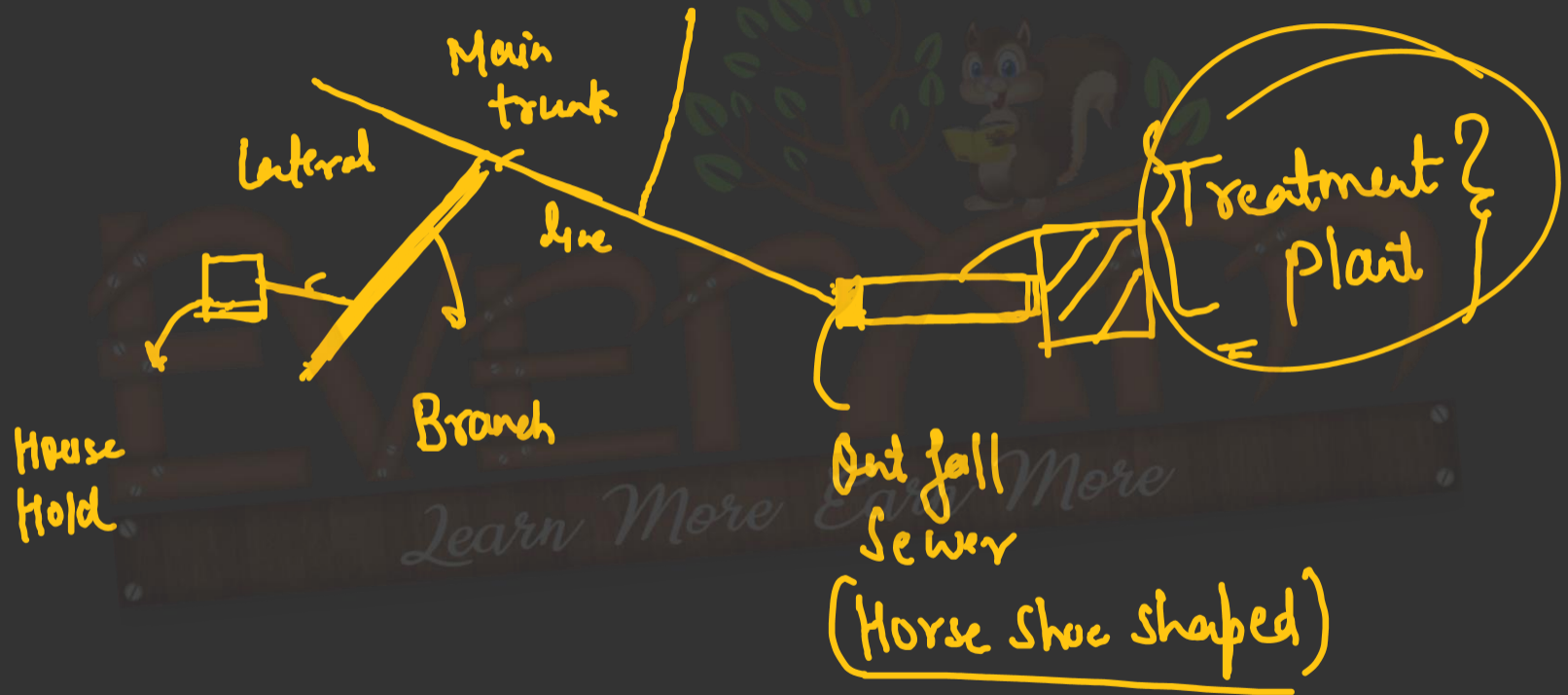
A : Relief sewer

B : Lateral sewer

C : Intercepting sewer

D : Outfall sewer

✓✓ (D)



Q : 83) Which of these shaped traps are NOT used in water closet?

A : P Trap

B : C Trap

C : S Trap

D : Q Trap

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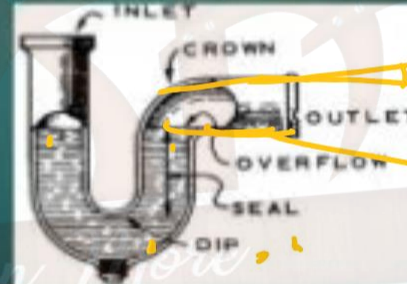
Q Trap

- This trap is used in toilet under water closet.
- It is almost similar to S trap and is used in upper storey other than ground floor.



P Trap

- This trap is used with Indian water closet.
- The traps are made from cast iron or UPV sheet.
- This trap also has water seal and prevents entry of foul gases to the house.



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S Trap

- This trap is similar to P. trap and is used for fixing water closets in toilets.
- The only difference between P trap and S trap is that P trap is used for outlet through the wall whereas S trap is used for outlet through the floor.



Q : 84) The sewer which receives the discharge from number of independent house is called

A : House sewer

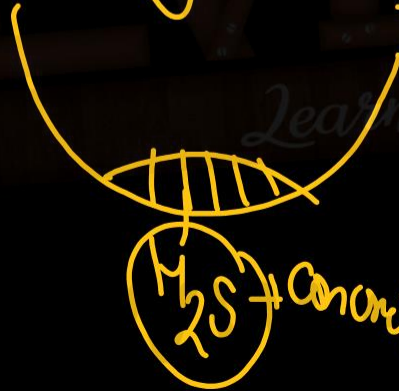
B : Intercepting sewer

C : Lateral sewer

D : None of the above

Q : 85) Which of the following statement are true about design of sewers?

Minimum self
Cleansing
velocity



1. The flow velocity in the sewers should be such that the suspended materials in sewage get silted up.
2. It is important to limit the maximum velocity in the sewer pipe.
3. It is necessary that the sewer pipes be laid at such a gradient, as to generate self cleaning velocities at different possible discharges.

A : 1 and 2 only

C : 1 and 3 only

B

B : 2 and 3 only

D : 1, 2 and 3

Q : 86) Three different type of sewers are

A : Sanitary, storm and conventional

B : Sanitary, storm and combined

C : Sanitary, storm and ground water

D : Conventional, surface and combined

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Industrial - Q, x

Domestic
waste Q_1, x_1

Q : 87) Consider the following statements with reference to the mixing of industrial waste water with domestic waste water

1. The industrial waste water can be mixed with domestic water when it has higher BOD. *Organic matter (Bacteria)*
2. The industrial waste water can be mixed with domestic water when the pH value of industrial waste water is highly alkaline.

Which of the above statements is/are correct?

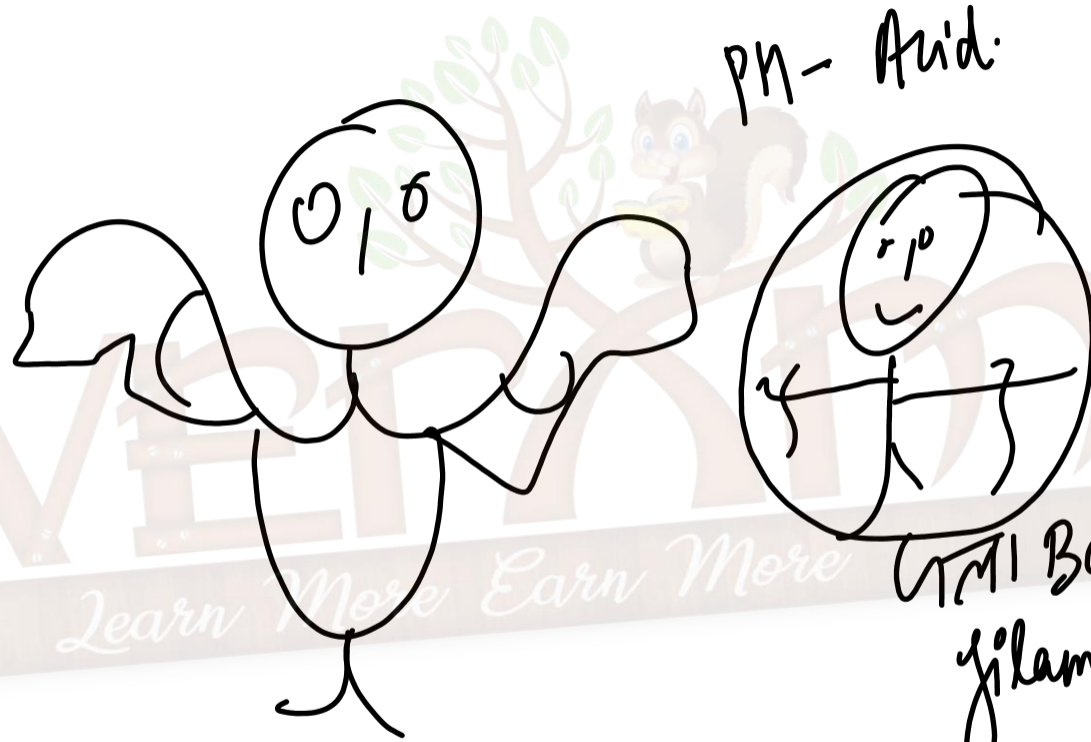
A : 1 only

B : 2 only

C : Both 1 and 2

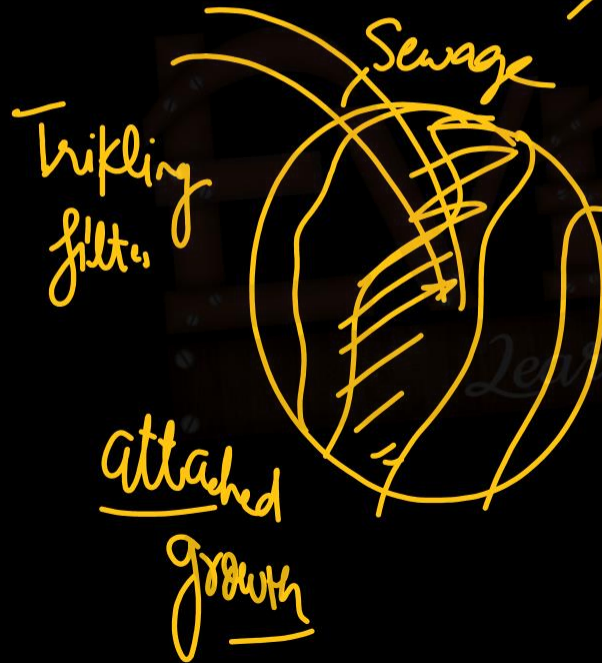
D : Neither 1 nor 2

C



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Min. dia of Sewer = ?
150mm



Q : 88) Activated sludge process is an example of:

A : Anaerobic attached growth process

B : Anaerobic suspended growth process

C : Aerobic attached growth process

D : Aerobic suspended growth process

✓
Asp - aeration tank

X
S
O
V

Q : 89) A sewer that receives the discharge of a number of house sewers is called :

A : House sewer

☒ B : Lateral sewer

C : Intercepting sewer

D : None of the above

Sludge/Sewage #

Q : 90) A device in which sludge is dewatered by rapid rotation and automatically discharged, is known as :

A : Agitator

B : Vacuum suction

☒ C : Centrifuge

D : Filter

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agitators are used for effective mixing,
avoiding deposits and to generate flow.

XIS

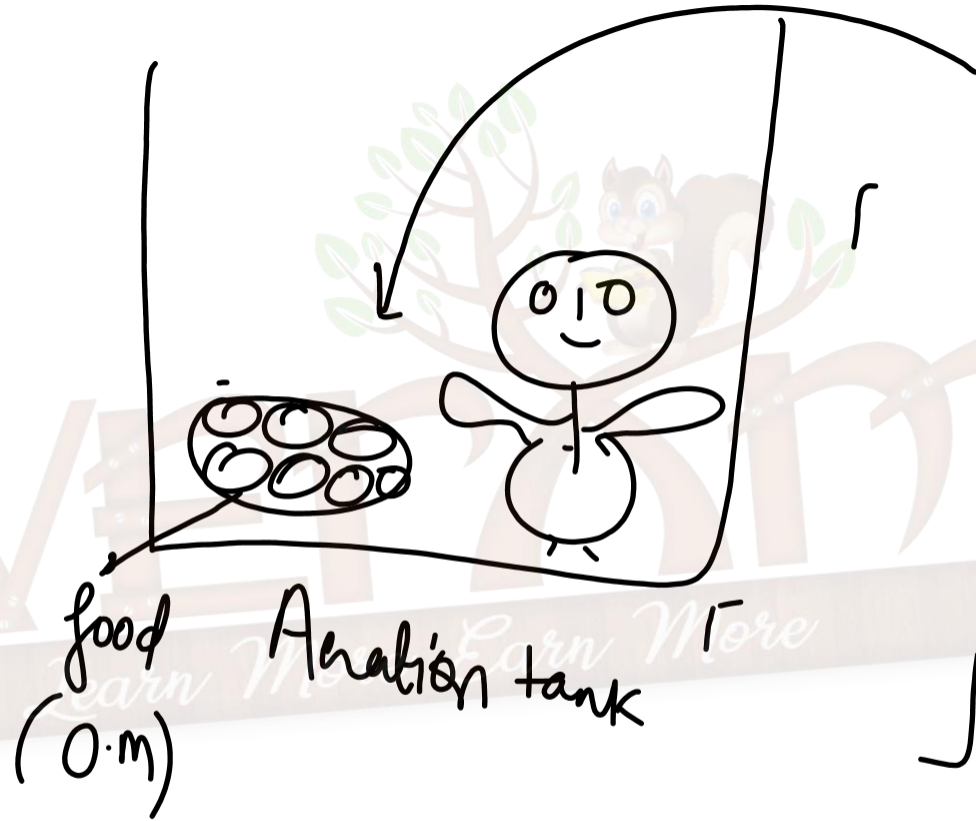


mixing

Centrifugal thickening and dewatering of sewage sludge is a high speed process that uses the force from rapid rotation of a cylindrical bowl to separate wastewater solids from liquid to produce a non-liquid material referred to as "cake." Dewatering wastewater solids reduces the volume of residuals, improves operation,

Centrifugation





Connected with WC



Q : 91) Anti-siphonage pipe is used to

A : Provide connection with soil pipe

B : Provide ventilation of air in the toilet

C : Prevent foul smell from entering the toilet

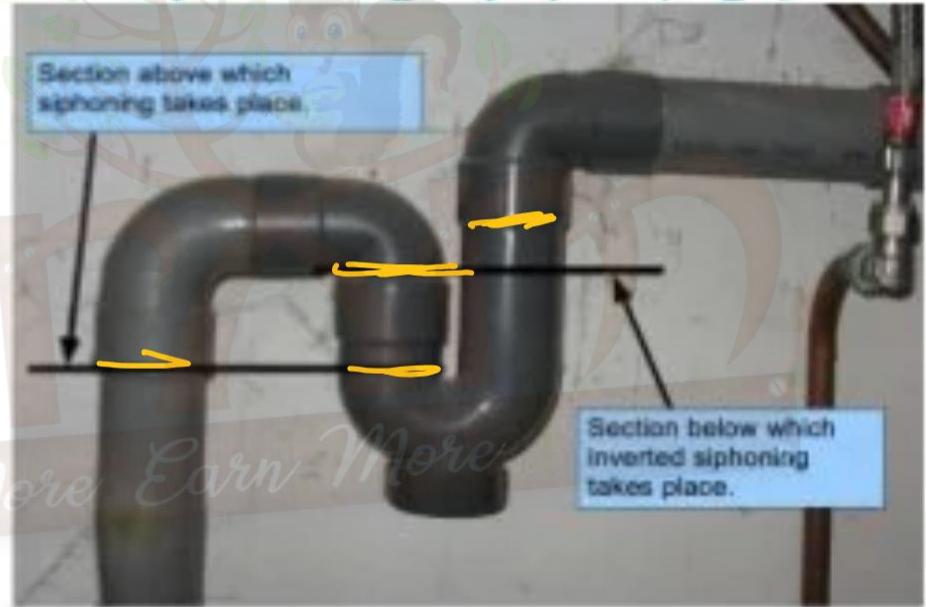
D : Preserve the water-seal of traps

D

Sewage pipe-

An extra pipe connected to the outlets of toilet seats of all the floors, the other end of which is exposed to atmosphere is called anti-siphonage pipe.

Anti- siphonage pipe (fig.):



Q : 92) A pipe installed for ventilation process is called :

A : Anti-siphonage pipe

B : Vent pipe ✓

C : Soil pipe

D : Waste pipe

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Q : 93) Two pipe system of providing building drainage consists of :

A : One soil pipe + one waste pipe + one vent pipe + One sullage pipe

B : One soil pipe + One waste pipe + two vent pipes

C : Two soil pipes + two waste pipes

D : Two soil pipes only

Q : 94) Which one of the following is not a type of trap used in plumbing?

A : p-type

B : q-type

C : s-type

D : z-type

D.

Q : 95) As per CPHEED manual, the minimum velocity at initial peak flow and ultimate peak flow and ultimate peak flow in a sewer should not be less than,

A : 0.3 m/s and 0.6 m/s

B : 0.6 m/s and 0.8 m/s

C : 0.6 m/s and 1.2 m/s

D : 1.2 m/s and 3 m/s

(B)

0.6 m/s

0.8 m/s

Q : 96) A pipe which is installed in the house drainage to preserve the water seal of traps is called:

A : vent pipe

B : Anti-siphonage pipe // B.

C : Waste pipe

D : Soil pipe

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Q : 97) A 2% solution of sewage sample is incubated for five days at 20°C. The depletion of oxygen was found to be 3 ppm. The BOD of raw sewage will be:

$$\frac{(100 - 2) \times 0.05}{100} \times 100$$

$$= 3 \times \frac{100}{2}$$

$$3 \times 50$$

$$= 150 \text{ ppm}$$

ppm = $\frac{\text{mg}}{\text{L}}$

A : 150 ppm

B : 200 ppm

C : 300 ppm

D : 250 ppm

$$\frac{2 \text{ mL} + 98 \text{ mL}}{100 \text{ mL}} = \frac{100}{100} = 1$$

Q : 98) When sewer gets discharged them two or more main sewers it is called

A : Leading sewer

B : Trunk sewer

C : Combing sewer

D : Intercepting sewer

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SWM

Q : 99) Which of the following, is the method used for land filling of solid waste?

(A)

A : Canyon method

Valley Filling method

B : Bangalore method

(Anaerobic condition)

C : Load count method

D : Indore method

(Aerobic)

Compositing

Home work.

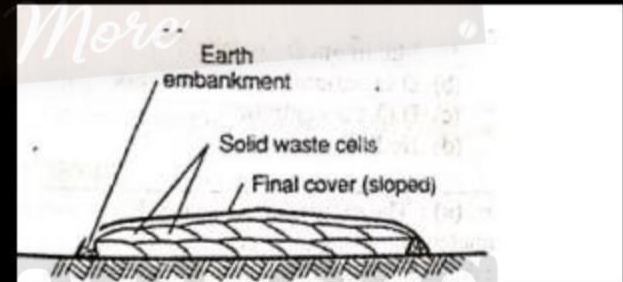
Q : 100) Identify the type of land filling shown in figure.

A : Trench method

B : Indore method

C : Depression method

D : Area method





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(BRO)





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