


CMR INSTITUTE OF TECHNOLOGY		USN NO							
<b>IMPROVEMENT TEST</b>									
Sub:	RURAL WATER SUPPLY & SANITATION						Code:	10CV666	
Date:	31 /05 / 2017	Duration:	90 mins	Max Marks:	50	Sem:	6	Branch:	Civil
<b>Answer FIVE FULL questions</b>									
							Marks	OBE	
								CO	RBT
1	What is a privy? With the help of sketch explain aqua privy and septic tank.						10	CIV608.2	L2
2	With the help of sketch explain the working of types of centrifugal pump. Also mention its advantages and disadvantages.						10	CIV608.2	L2
3	Briefly explain the diseases transmitted through intestinal discharges and their preventive measures.						10	CIV608.6	L1
4	Explain the different methods of disposal of night soil by composting.						10	CIV608.4	L2
5	Explain the life cycle of housefly.						10	CIV608.6	L1

CI

CCI

HOD

1) What is a privy? With the help of sketch explain aqua privy and septic tank.

Ans: A privy provides privacy during disinfection.

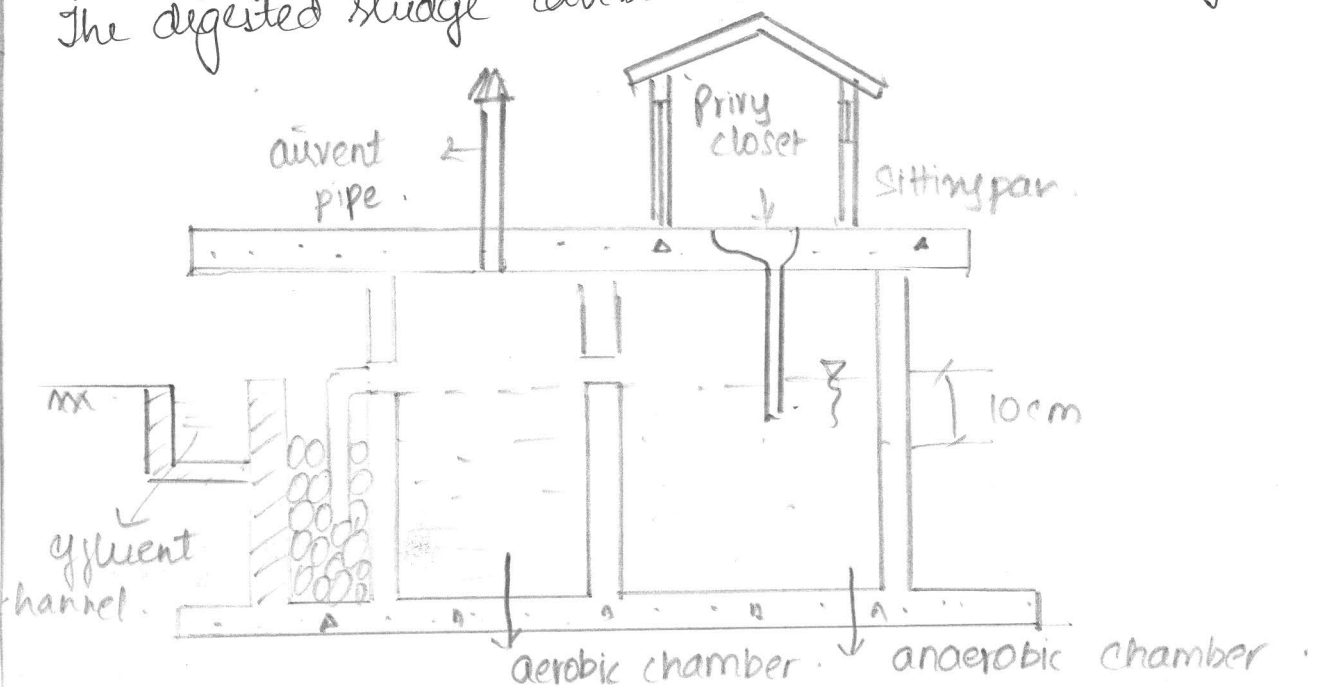
Aqua privy:

These privies are known as wet privies and it consists of

- (i) Anaerobic digestion chamber
- (ii) aerobic digestion chamber

A conventional aqua privy is shown in the figure:

A pan is kept on the top of the anaerobic chamber and its discharge pipe is kept 10cm below the H<sub>2</sub>O level to maintain a H<sub>2</sub>O. The night soil is decomposed by anaerobic bacteria was produced. Escapes through the vent pipe provided in the aerobic chamber. The effluent from the second chamber after aerobic digestion passes through the filter bed and this filtered effluent can be used for farming activities. The digested sludge can be cleared once in 2 years.



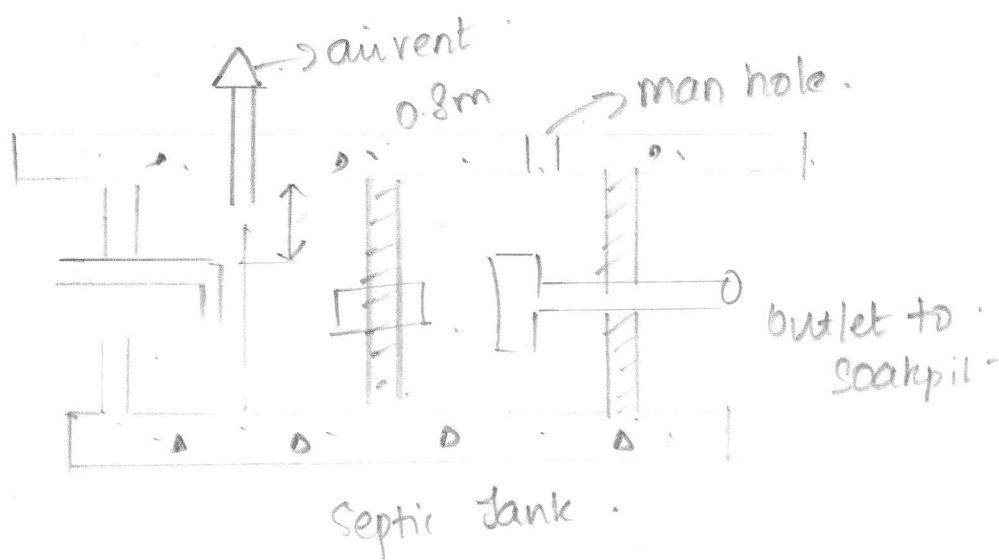
## Septic tanks:

Whenever community toilet facilities are provided, it is necessary to construct a septic tank for the disposal of effluents.

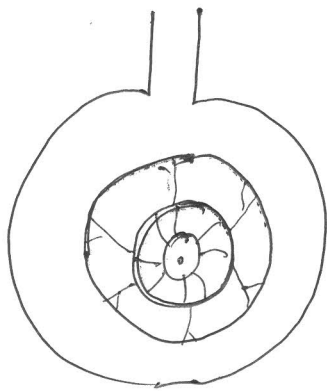
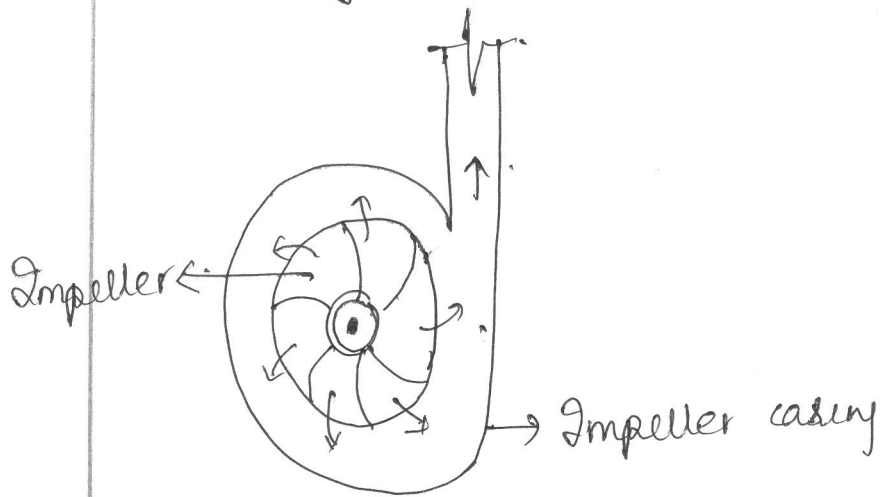
Septic tank functions like a primary sedimentation tank with a longer detention time, in which anaerobic digestion of sludge takes place. Since septic condition prevails in their tank, the name implies septic tank.

The tank is capable completely covered at the top with provision of air vent pipe to vent out foul gases like  $\text{CO}_2$ ,  $\text{H}_2\text{S}$ , and  $\text{CH}_4$ .

The septic tank is so designed to accommodate the sludge @ the bottom and the effluent from the septic tank rich in dissolved and suspended solids along with pathogens is disposed off either for sub-surface irrigation or into soak pits due to anaerobic digestion of sludge and consequent release of gases - appreciable reduction in the volume of sludge takes place.



② With the help of sketch, explain the working of types of centrifugal pump. Also mention its advantages and disadvantages. ②



Turbine Pump.

### Working

- 1) Centrifugal pumps are displacement
- 2) This pumps sucks water from the sump and delivers to the over head tank.
- 3) During the this, it creates a vacuum in the impeller due to which water is carried out from lower head to higher head.

③ Briefly explain the diseases transmitted through intestinal discharges and their preventive measures. ③

→ Typhoid fever: It is caused due to some sanitary defect. It has been traced to H<sub>2</sub>O contaminated by the discharges of patient (or) carriers. Food contamination by carriers during preparation, food contaminated by flies, the eating of vegetables fertilized with human excreta, are all responsible for typhoid epidemics.

→ Paratyphoid fever: They can be of A, B and C type according to the causative organisms. Occurs due to infected H<sub>2</sub>O and other foods. The symptoms are similar to typhoid fever but much milder.

→ Dysentery: It is caused by bacilli *Shigella* genes and amoebic dysentery is due to an amoeba known as *Entamoeba histolytica*.

~~The bacilli~~

The cysts can be removed from H<sub>2</sub>O with standard treatment of coagulation, sedimentation, filtration & disinfection.

→ Hookworm disease: The adult hookworm lives in the intestines of human beings, bites the walls of intestine and causes loss of blood. Toxins are also liberated which are responsible for anaemia. Elimination of soil pollution by provision of proper sanitized toilet facilities help in its control.

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— Indore method of composting. (4)  
Here, cow dung is placed in brick lined pits, in alternate layers of 7.5 to 10 cm. The material is turned for a period of 8 to 12 weeks and then stored on the ground for 4-6 weeks. In 6-8 turnings and around 4 months time, the compost becomes ready for use as manure.

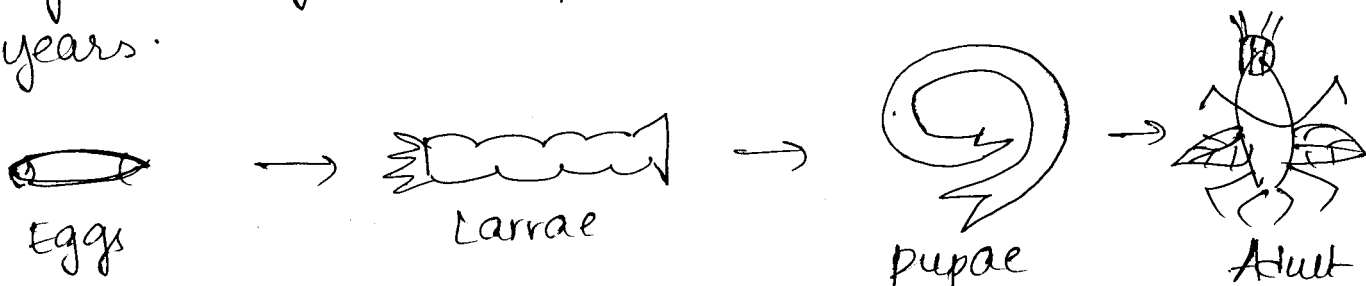
— Bangalore method of Composting.  
Trenches are filled up in alternate layers of refuse, night soil and cowdung. The material is covered with 15 cm layer of good earth and left for decomposition without turning and in around 4-5 months, the composed soil becomes ready to use as manure.

⑤ Explain the life cycle of a house fly.  
It is characterized by complete metamorphosis with 4 stages.

- (1) Egg
- (2) Larvae
- (3) pupae
- (4) Adult mosquito.

The adult female lays eggs in batches ranging from less than 50 to more than 200 and one female may deposit several batches in her lifetime. The egg of some species come together in mass which float on the  $H_2O$ . Others are deposited on the soil @ the edge of  $H_2O$ . The incubation period is usually 2-3 days in warm weather and eggs of the same species can

withstand. long period of drying or cold. The Eggs of some of the mosquitoes may remain dormant for years.



The Eggs are hatched into Larvae which are aquatic however they are air breathers with breathing tube at the tail. The pupae are called as tumblers and are still aquatic and air breathing but do not feed. The adult winged insect is formed during this period of development and emerge as adults in 2 days. Upon emerging adults rests on the surface of  $H_2O$  until its wings dry and harden. Only the female mosquito is able to bite humans and animals through the piercing mouth parts.