AJAY KUMAR GARG ENGINEERING COLLEGE, GHAZIABAD
DEPARTMENT OF CIVIL ENGINEERING

SESSIONAL TEST -2 (Solution)

Course: B.Tech
Session: 2017-18
Subject: Industrial Pollution Control and Env. Audit
Max Marks:50

Semester: VII
Section: CE-1 & CE-2
Sub. Code: NCE-034
Time: 2 hour

SECTION -A

1 → Attempts all the parts.

a) Differentiate between Absorption and adsorption.

Ans →

S.N.	Absorption	Adsorption
1.	It's the phenomena where liquid is completely sucked by the other object.	It's the phenomena where the particle of some object gets attached on the surface of other object.
2.	This is complete body phenomena.	This is a surface phenomena.

b) What do you mean by 'Concept of zero discharge effluent'.

Ans → Zero Discharge effluent → The phenomena or concept of removing complete waste from the Industrial effluent before discharge of effluent in some water bodies is called Zero Discharge effluent.

It says that effluent should be free from any pollutants. It means No or minimal Discharge of effluent and Reuse of waste water effectively.

c) Explain Dewatering of Sludge in Detail.

Ans → Def" → It's the physical process of removing of water from the sludge as the Sludge Contain 99% of water and It's difficult to transport.

Purpose → ① Easy Transportation
② Easy Disposal
③ Economical Disposal

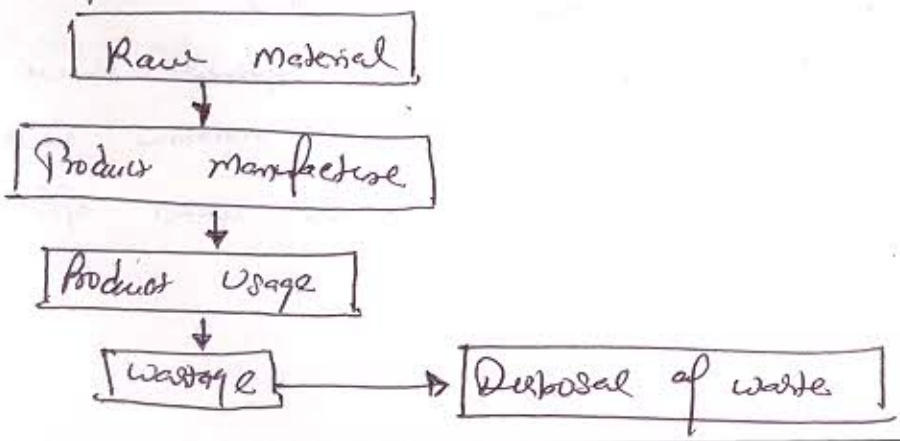
d) List the various liquid and Gas emissions from various Industries in India.

Ans → ① Gases like NO_2, SO_2, SO_3, NO, NO_3 etc.
② Harmful liquid like Chemicals, fertilizers etc.
③ liquid like Pulp of Paper.
④ Harmful Gases like H_2S, Cyanide
⑤ liquids Containing Oil & Grease
⑥ Hazardous Solution

e) Explain 'Cradle to Grave' Concept

Ans → As the Name suggest, the Concept deals from —
"BIRTH TO DEATH"
It means from the extraction of waste to the dubose, what are the stages in between this.

The Concepts stands for the complete steps that have been followed from the manufacturing of the product to the Disposal of those that product.

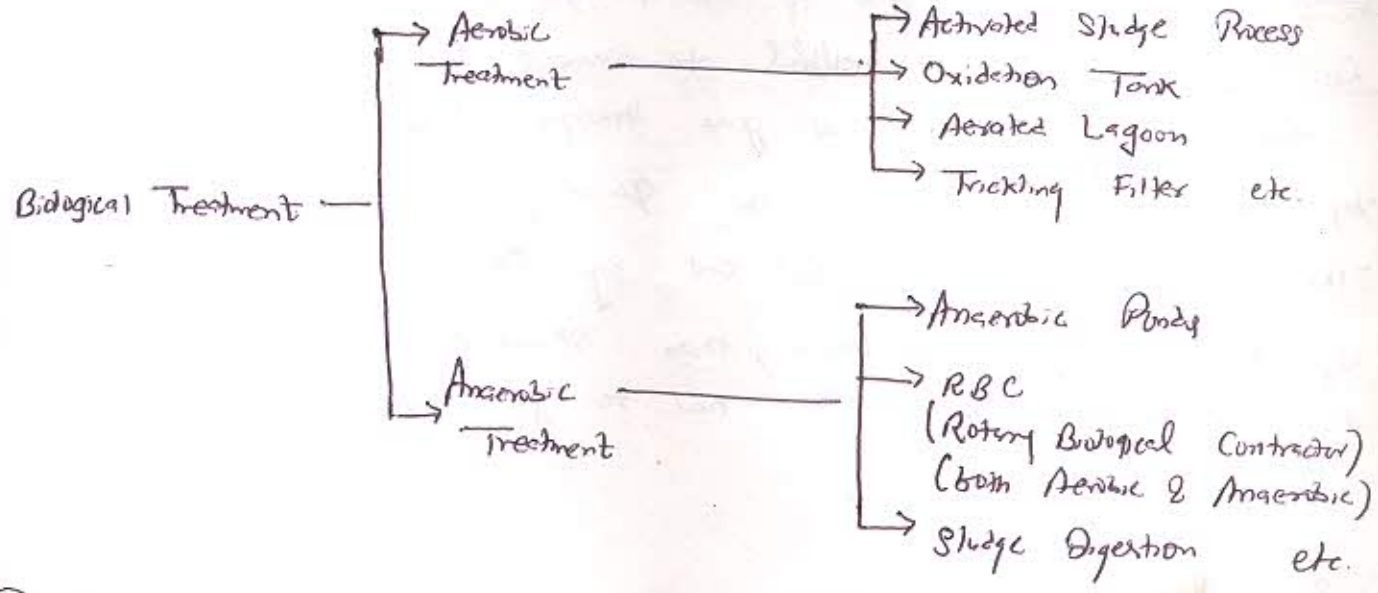


SECTION-B

2→ Attempts all the parts.

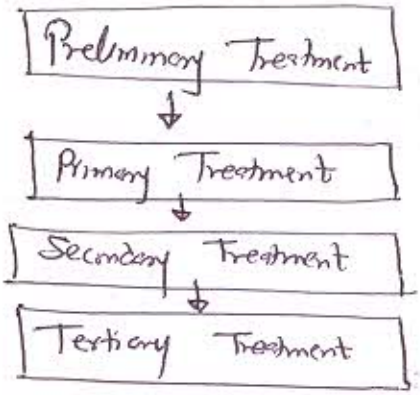
a) What are the two commonly used systems for Biological waste Treatment. Explain them.

Ans → Biological waste Treatment also called Secondary Treatment Process.



(b) Discuss the hierarchy of various treatment option of Industries Waste.

Ans →



① Preliminary Treatment → It consists of
- a) Grit Removal
- b) Oil & Grease Removal
- c) Coarse material Removal

② Primary Treatment → It consists of
- a) Sedimentation
- b) filtration
- c) filtration with coagulation & flocculation

③ Secondary Treatment →
It's also called Biological Treatment.
It's used to remove organic waste.
It include, ASP, RBC, Aeration Tank etc.

④ Tertiary Treatment → It consists of Defluoridation, removal of Cyanide etc.

(c) How do you determine the quantity of Oil & Grease in waste water sample? Give Detail.

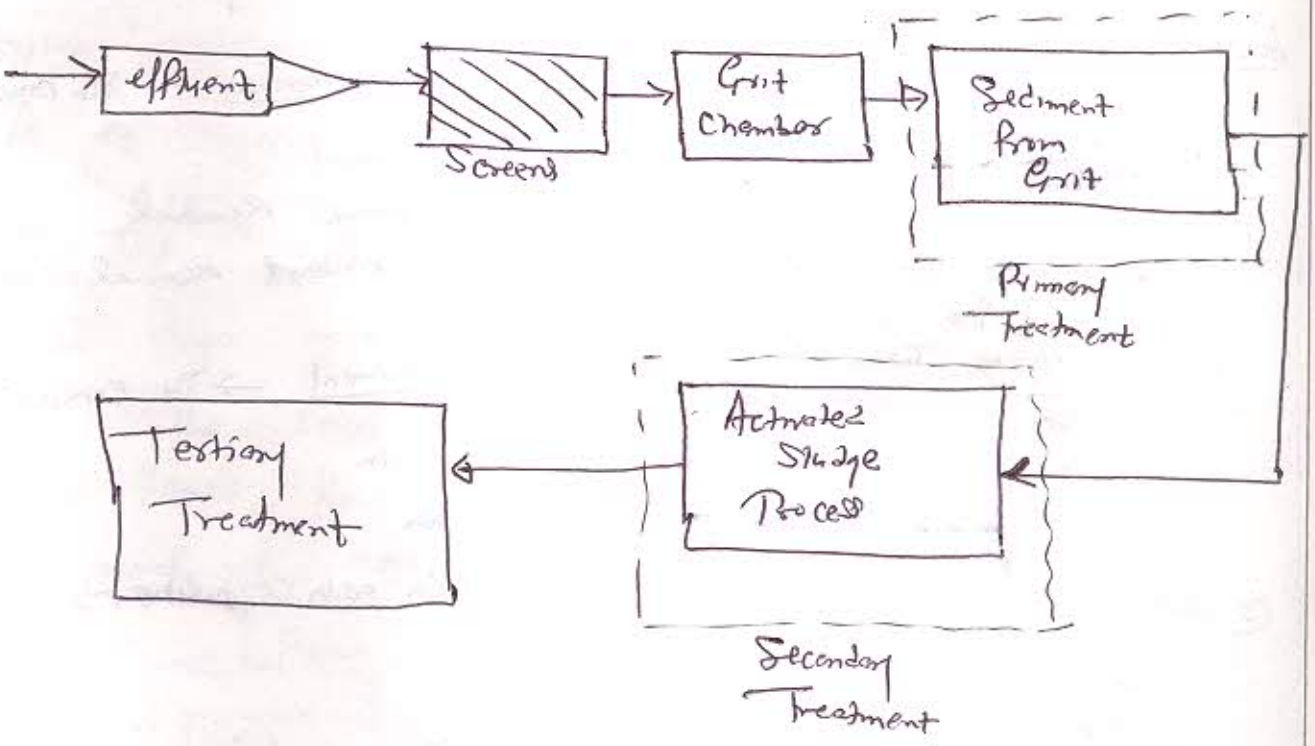
Ans → O & G can be removed by skimming process. as the Density of Oil & Grease is lower than the of waste water so it floats on the top of waste water & can be easily removed by skimming.

Density Separator → It's one of the process to remove O&G.

Distillation Process → It's helpful to remove O & G from W.W. In this process, sample is gone through distillation procedure & by this, we can find the quantity of O & G seperately. The quantity can be find out by checking outs it weights & if the quantity is lesser, then skimming can be done but if it's more, then it has to go through the various steps & procedures.

(d) Briefly explain the Waste-Water Treatments methods

Ans →



(c) How is the control & removal of Chemicals such as Cyanide, fluoride, Toxic Organics performed?

Ans → (a) CYANIDE

It's removed by

1. Dilution (↓ the concentration of water)
2. Membrane (Reverse osmosis is used)
3. Electrowinning
4. Rutilation
5. Oxidation

(b) fluoride

It's removed by

1. Chemical addition
2. Chemical Contact
3. Activated Carbon Process
4. Filtration Process

(c) Toxic Organics

It's removed by

1. Ultrafiltration
2. Activated – Carbon Process
3. Chemicael addition
4. Photolysis
5. Neutralization

SECTION - C

(3) Attempts all the parts.

(a) Write down characteristics of liquid effluent from Sugar Mill. Draw a flow Diagram for the Treatment of the same. Also give some detail of each Unit shown in flow Diagram.

Ans → Characteristics of liquid Effluent from Sugar Mill →

(1) The liquid effluent which we get from a sugar mill is very Low on the Parameter of quality.

(2) It mainly Contain organic Waste or sugar is manufactured from the sugarcane which is organic in nature.

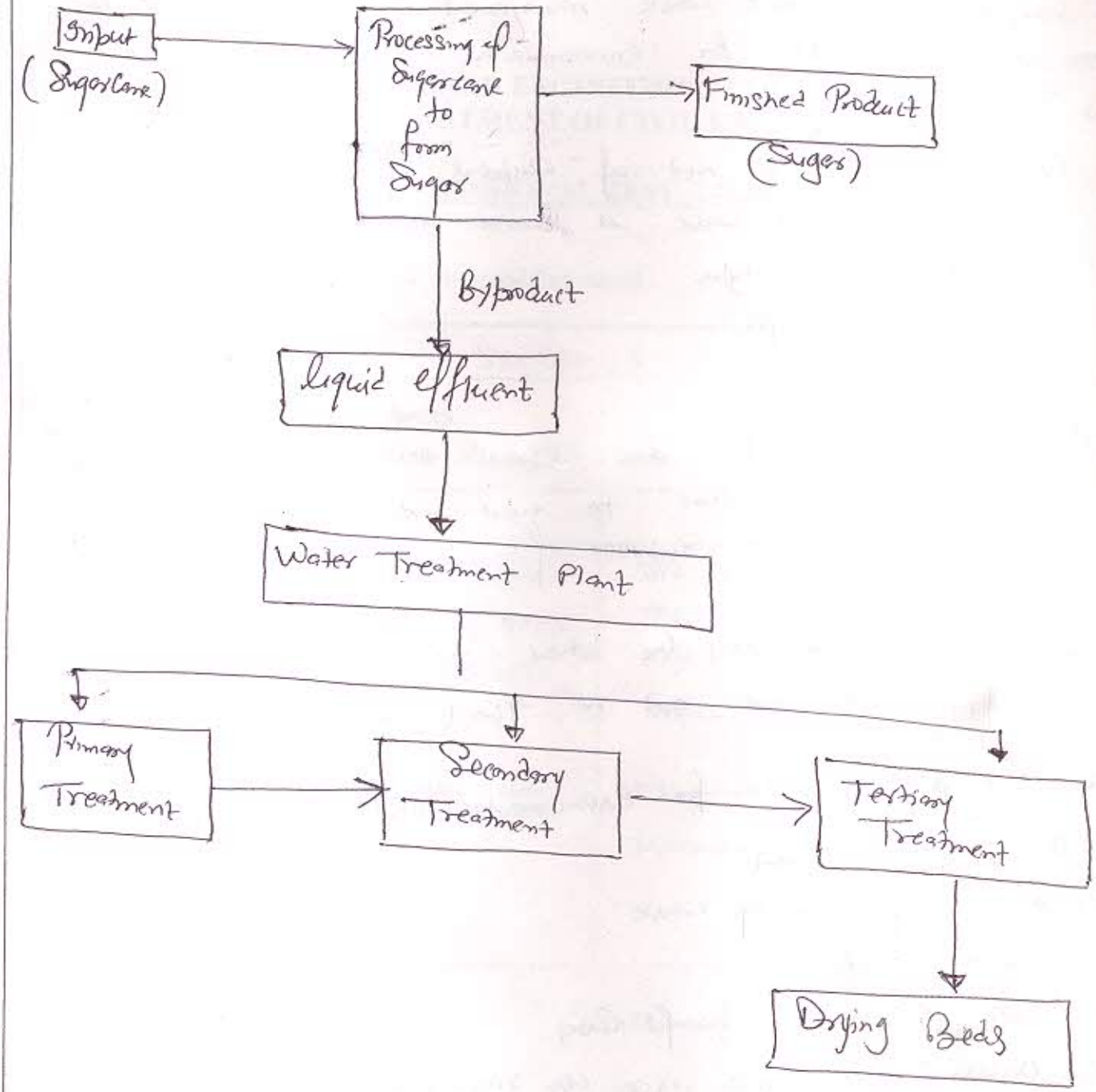
(3) The liquid also contains polymers of long chain due to reaction of glucose & fructose.

(4) Methane gas (CH_4) is also dissolved to some extent in it.

(5) Its particles are dissolved in the waste water & Chemicals by products.

(6) The Chemicals mainly catalysts are dissolved in it.

These effluents are very harmful for Environment if not properly treated before disposing off to the Environment.



(Flow Diagram for Treatment of liquid effluent)

(6) What is Landfill? Which Type of waste should be Disposed off into a landfill as per Solid waste management rule (2000)? What are main Pathways involved for environmental Contamination?

Ans → LANDFILL →

(1) It's one of the mtd of Disposal of waste
(2) In this Solid waste is buried into the Land
(3) It's of two type
   a) Area Landfill
   b) Trench "

(a) Area Landfill → It's done where the excavation can not be done to more depth. Area are divided and after disposed of waste, It's covered.

(b) Trench Landfill → It's done where the deep excavation can be done and no effect on the ground water.

Main Pathways involved for Environmental Contamination →

(1) Disposal w/o Treatment
(2) Road side Dumping of waste
(3) Motor vehicles
(4) Leakage of various harmful Gases
(5) Disposing of household waste w/o segregation
(6) Direct Emission of gases
(7) Burial of hazardous Chemicals
(8) Direct Dumping of Industrial waste into River.