

DATE: 21/10/25

Section-I

Q.4

a)

Write note on Chlorophyll?

Chlorophyll is green pigment, present in leaf of plant. It is called food factory as the process of photosynthesis occurs here.

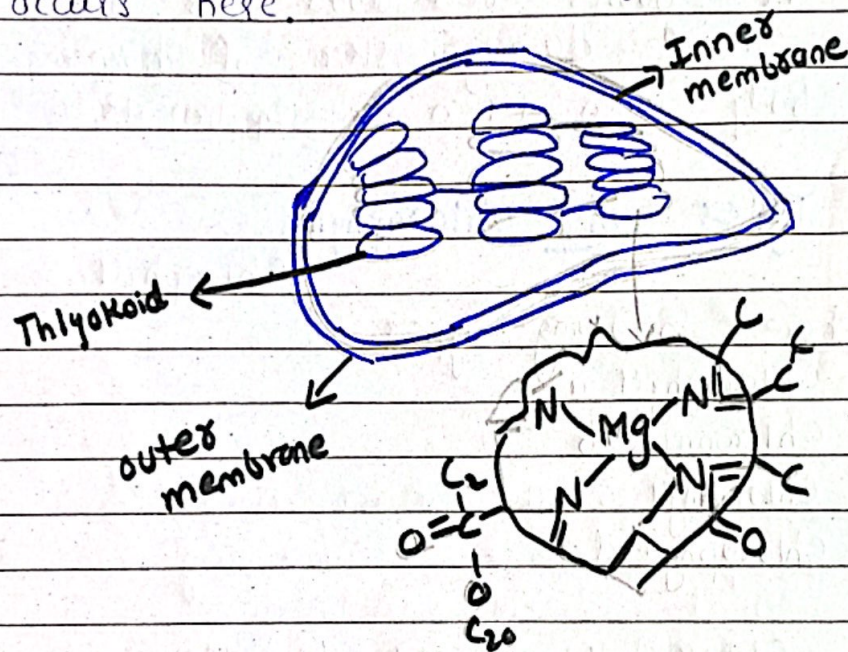


Fig: Chlorophyll

→ Functions of Chlorophyll:

Chlorophyll performs following functions:

- (i) Chlorophyll helps in photosynthesis. The process in which plants

prepare their food. Chlorophyll absorb energy which then used to convert carbon dioxide and water into carbohydrates.

(ii) Chlorophyll is responsible for the green colour of leaf.

(iii) It boosts red blood cells and heal damage skin of human body when taken in supplements.

→ Types of Chlorophyll:

Chlorophyll have following types.

- (i) Chlorophyll a
- (ii) Chlorophyll b
- (iii) Chlorophyll c
- (iv) Chlorophyll d

Chlorophyll (a) and (b) are in higher plants while (c) and (d) type are in algae.

(b) Describe the role of ribosomes in protein synthesis?

Ribosomes act as

the cellular machinery that builds protein by translating the genetic code carried by messenger RNA. They bind to the mRNA, reading its sequence of codon and recruit transfer RNA molecules carrying specific amino acids. The ribosome then links these amino acid in correct order to form polypeptide chain that functional into a protein.

→ Key role in protein synthesis:

(i) Reading the genetic code:

Ribosomes move along the mRNA, read the sequence of codon. Each codon specifies a particular amino acid.

(ii) Catalyzing the polypeptide formation:

The ribosomal unit contains an enzyme that catalyzes the formation of peptide bonds between amino acids.

(iii) Translation process:

Ribosomes have specific sites that aid

DATE: ___/___/___

in translation process.

(Pv) Assembling the protein chain:

The ribosomes link the amino acid in precise manner in a growing a long chain called polypeptide.

(vi) Forming the complete protein:

Once ribosome reach a stop codon on the mRNA, the polypeptide chain is released and it folds into a three dimensional protein.

c) Solid Waste Management?

Solid waste management is a process of managing solid waste including waste from households, hospitals etc in a way that it does not damage or harm environment.

Following are different methods to dump solid waste.

(i) Landfill

(ii) Composting

DATE: ___/___/___

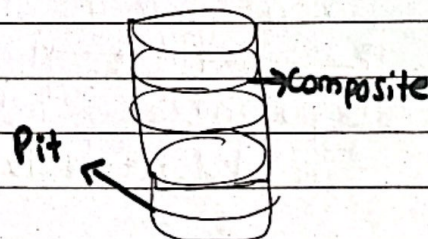
- (iii) Pyrolysis
- (iv) Incineration
- (v) Recycling

(a) Landfill:

Landfill is an easiest and most commonly used method in solid waste management. In this method, large hole is dugged on land and solid waste is dumped into it. There are certain criterias of selecting landfill including distance from residential areas. This method does not require burning or temperature.

(b) Composting:

Composting is another method of solid waste management. In this method, a hole is dugged with protected bottom called pit. The solid waste is dumped into layers. After each layer, waste is being compressed called composite. After layering of composites, the other end is covered.



(iii)

Pyrolysis:

Pyrolysis is a process in which solid waste is managed in high temperature but in absence of oxygen. The temperature is high enough to breakdown solid materials.

The range of temperature is upto 900°C . Mostly organic solid wastes such as municipal wastes go into pyrolysis process.

(iv)

Incineration:

Incineration is a process of wasting solid in high temperature in different chambers. The rotary kiln, use in incineration process has different chambers. There is different temperature in different chambers.

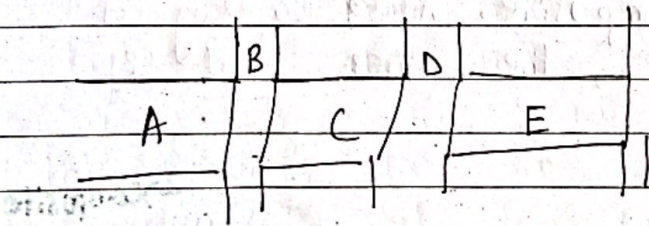


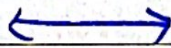
Fig.: Rotary Kiln

DATE: ___/___/___

The range of temperature is adjust from 650°C to 1100°C . In chamber A, solid waste is dumped. Organic waste exists from chamber B. Remaining waste enters into C. In chamber C, high temperature burns electronic waste and households waste and gases exit from D.

(vi) Recycling:

Recycling is a process of reducing and reusing stuff that can be recycled. For-example, Paper can be recycled 5 times. The practice of recycling aims to reduce solid waste by reusing it.



d) Define?

(i) Biofuel:

Biofuel is a type of renewable energy resources which is obtained from biomass, algae and wheat. Biofuels

DATE: ___/___/___

are ecofriendly resources. They are prepared from triesterification process.

Biomass + Algae $\rightarrow$ Biofuel

(b) Adulteration:

Adulteration is a practice in which food is adulterated by microorganisms, water, bacteria. It results in reducing quality of food and texture of food.

(c) Isotopes:

Isotopes are species that have same atomic number but different mass numbers.

Example: Protium and Tritium are isotopes of Hydrogen.

(d) Troposphere:

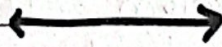
Troposphere is a layer of atmosphere above 50 km from the earth surface. The weather lies in the troposphere and temperature is moderate here.

(e) Hydrosphere:

Hydrosphere is a region in which water, lakes, ocean exist. It consists of water bodies, glaciers and fresh water sources.

The earth contains 71% of water, so hydrosphere comprises all water in sphere.

Q.3

(b) Doping? Types of semi-conductors?1) Definition:

Doping is a process in which impurities are added into semi-conductor to enhance its property of conductivity.

1.4) Types of Doping:a) n-type doping:

The type of doping in which pentavalent impurities are added into silicon or Germanium. For example, arsenic is added into silicon. Silicon forms four

covalent bond with arsenic and one free electron is left as arsenic has five valence shell electrons. This free electron moves freely and acts as a conductor.

- b) P-type doping: In P-type doping, trivalent impurity is added such as indium. It forms three covalent bonds with silicon and one left as a hole as silicon has four valence shell electrons. This hole enhances the property of conductivity.

2) Types of Semi-conductors:

Semi-conductors are substances that have both properties of conductors and insulators.

Following are types of semi-conductors.

a) Intrinsic Semi-conductors:

Intrinsic semi-conductors are pure and without impurities.
e.g. silicon

(b) Extrinsic Semi-conductors:

Extrinsic semi-conductors are not pure and doped with impurities such as trivalent or pentavalent atoms.

e.g. N-type semi-conductor
P-type semi-conductor

a) Why cell form organelles?
Discuss mitochondria?

1) Why cell form organelles?

Cell assembles themselves into group and formed organelles to perform specific functions efficiently for long time. Also, cell form organelles to compartmentalize functions.

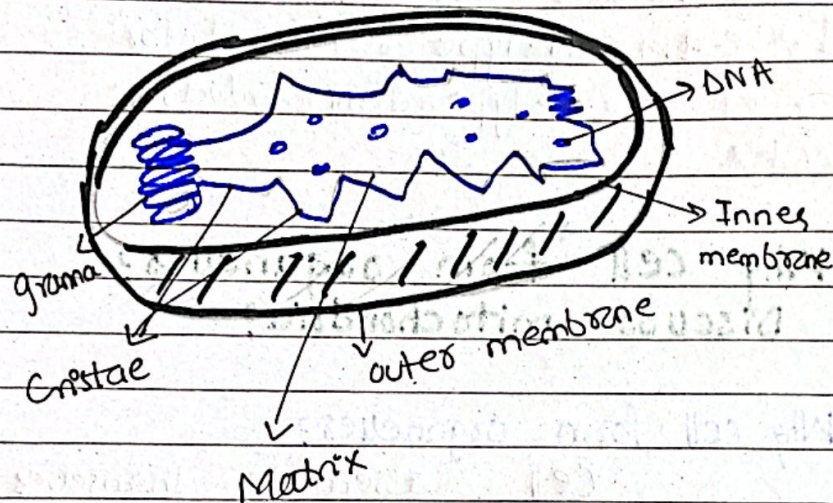
2) Mitochondria?

Mitochondria are called powerhouse of cell. Its numbers vary in each cell. It has two membranes: outer membrane and inner membrane. Structurally, it has cristae and grana embedded in

DATE: ___/___/___

matrix. Each mitochondria has its own self-replicating bodies called mitochondria DNA,

→ Structure of Mitochondria:



→ Functions of Mitochondria:

Mitochondria performs following functions.

- (i) They act as power house of cell. They provide energy to cell by converting ATP into ADP.
- (ii) They help in programmed death of cell.
- (iii) They are involved in metabolism and cell signaling.



(c) **Merits and demerits of Volcanic eruption?**

1) **Volcanic Eruptions:**

Volcanic eruptions are eruption of lava, magma from the earth. It erupts from a neck-like structure, called ventuse. The lava majority consists of sulphur.

Following are merits and demerits of volcanic eruption:

2) **Merits:**

Merits include,

(i) **Formation of New Land**

Volcanic eruption leads to form new land or area after eruption at long spread.

(ii) **Aids in Fertility of Land**

Volcanic eruption aids in fertility of land by depositing minerals.

(ii) Provides Geothermal Energy:

Volcanic eruptions provide geothermal energy. Earth has stored immense energy. Volcanic eruptions bring out stored energy.

(3) Demerits:

Demerits include,

(i) Environmental Pollution:

Volcanic eruption causes environmental pollution as lava contains fumes, particulate matters etc. It aids in environmental deterioration.

(ii) Causes Secondary Disasters:

Volcanic eruptions lead to disasters such as tsunami, earthquake etc. These disasters causes socio-economic losses and engulf lives of humans.

(iii) Health Damage:

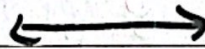
Volcanic eruptions

DATE: ___/___/___

pollute air. The particulate matter in air causes health problems such as skin problems, eye diseases and respiratory disorders.

(iv) Loss of Infrastructure,

Volcanic eruption damages infrastructure by earthquake and tsunami. This leads to loss of houses, roads, bridges etc.



d) Dengue?

1) Definition:

Dengue is a viral disease caused by Aedes Aegypti and Aedes Albopictus. These mosquitoes are active in early morning and afternoon.

(2) Symptoms:

Symptoms includes,

(i) fever

(ii) Headaches

(iii) Vomiting

(iv) Nausea and fatigue

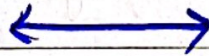
(3) Lifecycle of Virus:

Virus enters into human body by bite of mosquitoes. It binds to Langerhans cell and enters into its membrane. The cell moves to lymph nodes and genome of virus is translated into proteins and enters into white blood cells.

4) Remedies:

Following are remedies for Dengue fever.

- (i) Take plenty of rest
- (ii) Stay away from heavily populated areas.
- (iii) Make sure windows and doors are closed.
- (iv) Wear long sleeves in outdoors and use insect repellent.



DATE: ___/___/___

Section - II

Q.6

d) Unscramble terms?

(i) Statistics

(ii) Gambler

d) Solution:

A bicycle covers = 36 km

Speed = 18 km/hr

Starts at = 1 pm

Reach time = $\frac{36 \text{ km}}{18 \text{ km/hr}} = 2 \text{ hr}$

$= 2 + 1 = 3$

$= 3 \text{ pm}$

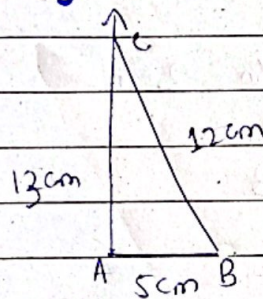


Q.7

(c) Spot the error?

(i) $\boxed{2}, 6, 18, 54, 162, 486$
 ↓
 error(ii) $3, 5, 7, 11, 13, \underline{15}$ 

d) Find angles?



$$\text{Angle } \angle AB = 180^\circ$$

$$\text{Angle } \angle AC = 90^\circ$$

$$\text{Angle } \angle BC = 85^\circ$$



e) Volume of sphere?

Solution

Given data:

$$\text{Diameter} = 14\text{cm}$$

$$\pi = \frac{22}{7} = 3.14$$

DATE: ___/___/___

Formula of sphere's volum = $\frac{4}{3} \pi r^3$

By adding values into formula,

$$= \frac{4}{3} \times 3.14 \times (14)^3$$

$$= \frac{4}{3} \times 3.14 \times 42$$

$$= 4 \times 1.14 \times 42$$

$$= 1.14 \times 168$$

$$= 1.8952$$



b) Find the smallest share?

Given data:

Total Savings = ₹25000

Ratio = 1:2:3:4:5

Smallest share = 25000

5

= 5000 rupee

