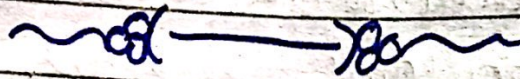


Name = M. Farham Khan

Paper = ~~poesi and composition~~

General science and  
Ability

Q Mock : NOA - 21/oct/2025



Part - II

Section - I

Q3

(a) Why cells form organelles? Discuss  
Mitochondria in a human cell?

Ans) cell

A cell is the smallest functional unit of life which perform the functions of the body.

## 2) Organelle formation

Cell form organelles for the functioning of cell functions.

For instance, a cell has organelles Mitochondria, Ribosomes, Endoplasmic Reticulum, membranes, lysosomes.

Each of these organelle has a specific function in cell like protein synthesis, energy creation, transport, assembling for the cell.

### 2.1) Different functions for which organelles are formed

2.1.1) Mitochondria: make ATPs for cell

2.1.2) Ribosome: synthesize protein for cell

2.1.3) cell membrane: work as gateway

2.1.4) lysosome: collect garbage of cell

2.1.5) Endoplasmic Reticulum:

Assemble amino acids in a particular coded way and read.

### 3) Mitochondria

3.1) Definition: Mitochondria is the power house of the cell where all the cell energy is created. It was discovered by Richard Altman in 1890.

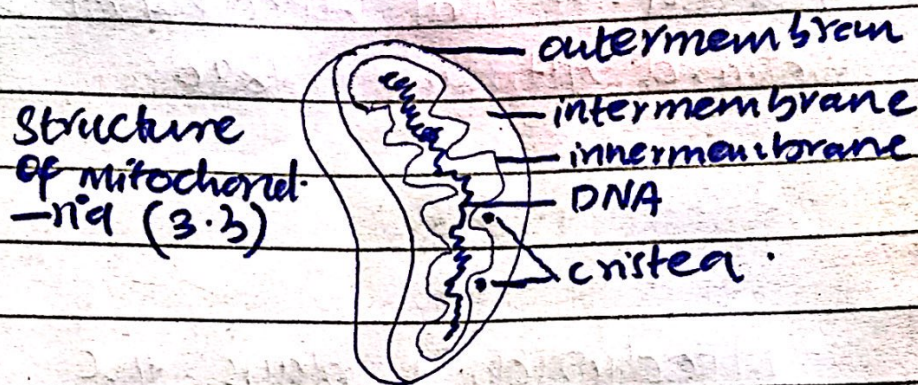
### 3.2) Function

Mitochondria plays the function of energy creation in the cell. Nutrition molecules are send to it by the cell which it convert into Adenosine Triphosphates through the process of oxidation. ATPs are the energy currency of the cell which are then used by different organelles in the cell for energy.

### 3.3) Structure

→ It has a double membrane body.

→ Mitochondria has 4 domains namely outer membrane space, inner membrane & intermembrane space and matrix which contain the DNA.



(B) Q. What is doping?  
Discuss different types of Semiconductors.

### (1) Semiconductors

A semiconductor is a naturally occurring element which is both conductor and insulator in different temperatures.

Ex: Germanium and silicon

### (2) Doping

Doping is the process

of adding impurities to a semiconductor atom for enhanced functioning. They are doped with pentavalent or trivalent atoms. For example Phosphorous or Boron

## 2.2) How doping is done

The process of doping is conducted by adding an impurity to a semiconductor. It is added in the ratio of  $1:10^7$ . A semiconductor has 4 valence electrons.

~~eg:-~~ By adding phosphorous which has 5 valence electrons it will make the semiconductor negatively charged. It will increase the conductance of semiconductor.

## 2.3) Purpose

Doping is done to increase the efficiency of conductor element. such as silicon to increase its conductance of electricity.

## (3) Types of semiconductors

There are two types of semiconductors  
- That are ① Intrinsic semiconductor  
② Extrinsic semiconductor

### 3.1) Intrinsic semiconductors

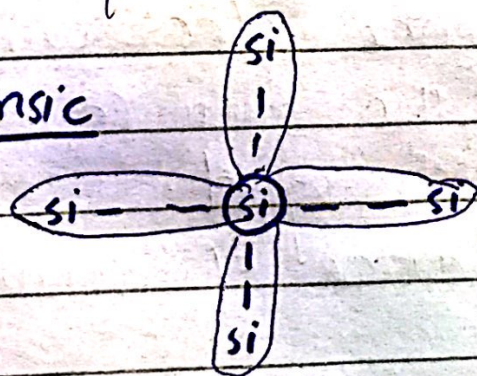
Intrinsic semiconductors are the pure form of semiconductors

eg Silicon and Germanium.

When the temperature is increased, they become conductor due to the break of covalent bonds. At zero temperature they are insulators

3.1) intrinsic

Silicon



### 3.2) Extrinsic semiconductors

Extrinsic semiconductors are the ones which are added

impurities for effective functioning of semiconductor. They are added two types of elements for impurity in a ratio  $1:10^7$ ,  
eg Pentavalent and Trivalent electrons

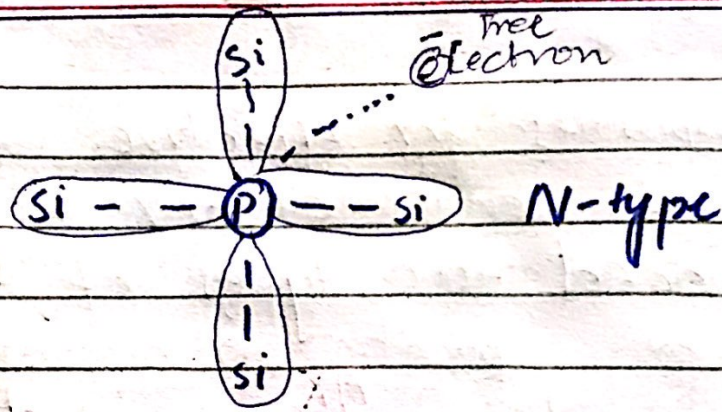
### 3.2.1) Types

There are two types of intrinsic semiconductors.

① N-Type    ② P-Type

### 3.2.1) N-Type

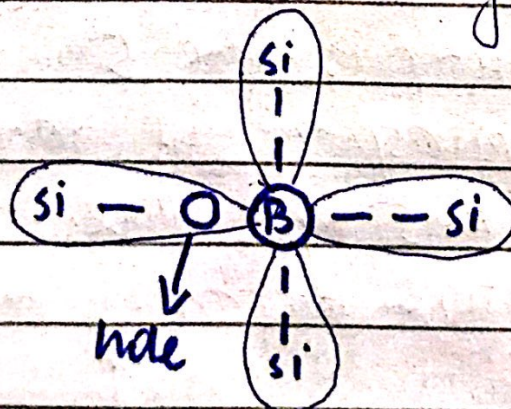
N-Type are the one in which a pentavalent element Atom which has 5 valence added to semiconductor such as Silicon. Silicon has 4 valence shell which make covalent bond with 4 electrons of Phosphorous. The 5<sup>th</sup> electron of phosphorous remain free. In this type the electrons are in majority and holes are in minority.



3.2.1.2

## P-Type

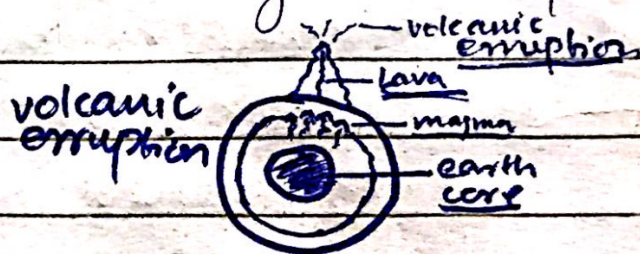
P-Type of extrinsic semiconductors are the one ~~leg~~ in which a trivalent Boron atom is added to silicon atom which has 4 valence electron. The 3 electrons of Boron make covalent bond with silicon and the 4<sup>th</sup> electron of silicon remain valent. This produced a positive charged semiconductors which has holes in majority and electrons in minority.



(c) State some of the merits and demerits of volcanic eruption?

Ans) volcanic eruption

volcanic eruption is the process of magma (lava) coming out of the crust.



1) Merits

(a) Fertility

The volcanic eruption which in the form of lava contain essential nutrients which make the land fertile.

(b)

(b) Landscape formation

The lava that pours out of the earth's surface cools when cools down into solid make new landforms.

(2) Demerits

### (a) Destruction of infrastructure and lives

volcanic eruption can wipe out entire village and kill as many as much as they come in its way 

The largest volcanic eruption was in Indonesia in 1815. It was a stratovolcano and killed 10s of thousands of people.

### (b) Pyroclastic flow

This kind of volcanic eruption flow at a speed of 100 miles per hour burning everything in its way

### (c) Earthquakes and Tsunami

volcanic eruption can cause earthquake and Tsunami 

In 1815 volcanic eruption in Indonesia, it triggered earthquakes and Tsunami which are disastrous to human lives.



(d) what is dengue? Discuss symptomology, causatives and remedies?

### (1) Dengue

Dengue is a severe infectious disease caused by a mosquito of species Aedes Aegyptis

### 2) Symptoms

The symptoms of Dengue fever include:

2.1) Fever: As the mosquito bite the person would get severe fever that is why dengue is often called Breakbone fever

2.2) Joint and muscle pain:

2.3) Headache and pain behind eyes

2.4) Skin or nose bleeding

2.4) Nausea

2.5) Cough, sour throat, nasal congestion

### 3) Causes

dengue flourishes in urban areas  
in man made containers, tier,  
clogged water, flower pot,  
house hold water.

#### 4) Remedies

4.1) Nets should be used means  
of sleeping outside

4.2) clogged water should be  
sucked through pumps

4.3) containers and tiers should  
be removed or sanitized.

Q 5%

#### (a) Pakistan's population explosion Causes

##### 1) low literacy

Pakistan has a  
low literacy rate of 59%.  
according to the Dawn news.  
This causes increase in birth

rates. Because countries with low literacy rates are high in birth rate  $\Rightarrow$  African countries have the highest birth rates and the lowest literacy rates.

## (2) Poverty

Poverty is another cause for high birth rates in poor Pakistan. Regions with highest poverty rates have highest birth rates  $\Rightarrow$  Chad and Somalia.

## (3) Religious stereotypes

Another reason for high birth rates in Pakistan is clerical message about continuous birth giving. Stopping birth, according to the religious clerics, is a sin in Islam.

## (4) Government lack of effective measures

There is no law in

Pakistan which restricts birth per parent to a specific limit.

### (5) Lack of policy by the state

Pakistan population explosion also a reason of lack of policy by the state. It is not in the security risk list of National Action Plan. Despite the population growth has created many security risk for limited resource, and employment opportunities.



## (6) Remote sensing and the role of GIS in environmental science?

### (1) Remote sensing

Remote sensing is the science of obtaining information about an object, area, or phenomenon from a distance using satellite, drones and aircraft.

# Purpose and benefits of remote sensing

Remote sensing is used to collect data about the earth's geography and atmosphere. Because the satellites and drones have the edge to collect data about a large area of earth, they are crucial for watching out changes in earth's geography and atmosphere.

## (2) Role of GIS in environmental science:

The GIS is a computer programme used to collect, store, analyze and display spatial data. They have an important role in environmental science.

### 2.1) Environmental impact assessment:

GIS is used to assess the area which is impacted by

any environmental hazard.

## 2.2) Resource management

The GIS is used to locate resources efficiently. It is also used to pinpoint regions of resource containing.

## 2.3) Urban and regional planning.

GIS is also used for urban and regional planning. Areas are demarcated to protect the environment and convenience of planning.

## 2.4) Climate change monitoring

The GIS is also used to assess and evaluate climate change and the increase in earth's temperature.



(c) The atmosphere is the blanket of earth? Justify your opinion.

(i) Atmosphere as the blanket of earth.

### (a) protection from heat

The atmosphere protect the earth from sun by refracting back the UV rays from entering the earth surface.

### (b) Air regulation

The atmosphere has essential capacity of air quantity. It regulates the air pressure on surface.

### (c) Precipitation

The atmosphere pours in essential amounts of precipitation for environmental regulation of earth.

### (d) locking in essential heat

The atmosphere also lock in essential heat from the sun necessary to regulate life on earth.



## (d) (i) Hydrometer

Hydrometer is an instrument of measurement used to measure the volume of water.

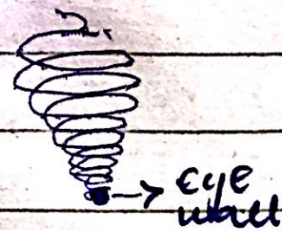
## (ii) Epicenter

Epicenter is the central point of earthquake wave generation.

## (iii) Eyewall of cyclone

Eyewall of the cyclone is a point where the rotation of air ~~has~~ take place and form the cyclone.

Here the air pressure is the lowest.



## (iv) Deep focus

Deep focus is a feature of Artificial Intelligence for indepth analysis and evaluation.

## (v) Light year

A light year is the unit

of measurement of distance  
in space. ~~leg~~ Earth distance  
from the sun is 150,000 light  
year.

## Section - II

(b)

Camera price = 200\$

discount = 25% of 200\$

Added tax on remaining = 6%

Taking out discount price after  
discount %.

$$\frac{25}{100} \times 200 = 50\$ \text{ discount}$$

$$200 - 50 = 150\$$$

Adding the 6% tax

$$\frac{6}{100} \times 150 = 9\$$$

$$150 + 9 = \boxed{159\$} \text{ price of camera.}$$

(c)

$\Rightarrow$  36 km total covered distance

$\Rightarrow$  speed 18 km per hour

$\Rightarrow$  starting time 1 pm

$\Rightarrow$  Reaching time = ?

calculating km covered in min

$$\frac{36 \text{ km}}{18 \text{ km}} \times 60 \text{ min} = \boxed{120 \text{ min}}$$

total distance covered in 120 min

$\Rightarrow$  Now calculating reaching time  
 $120 = 2 \text{ hr}$

$$1 \text{ pm} + 2 \text{ hr} = \boxed{3 \text{ pm}}$$

(d) term unscrambling.

(i) Statistics

(ii) Algebra.