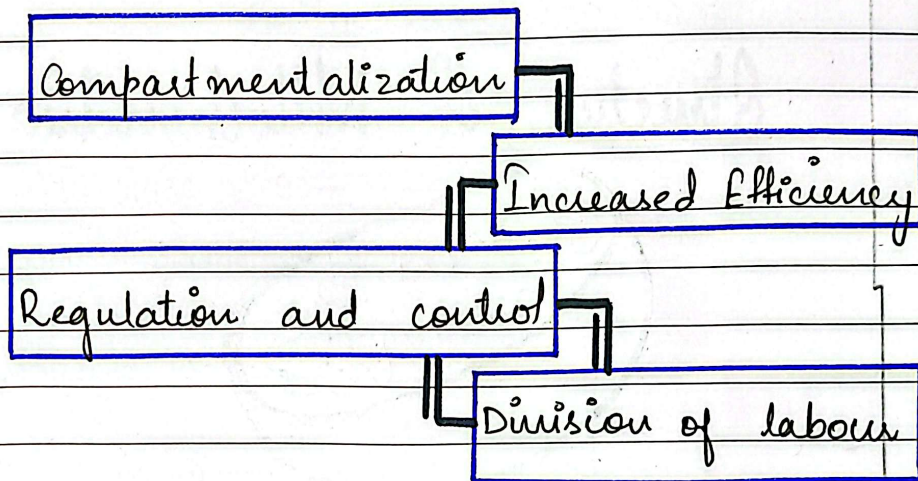


PART - II

(SECTION-A)

Q.NO. 03

(a) Why Cells Form Organelles

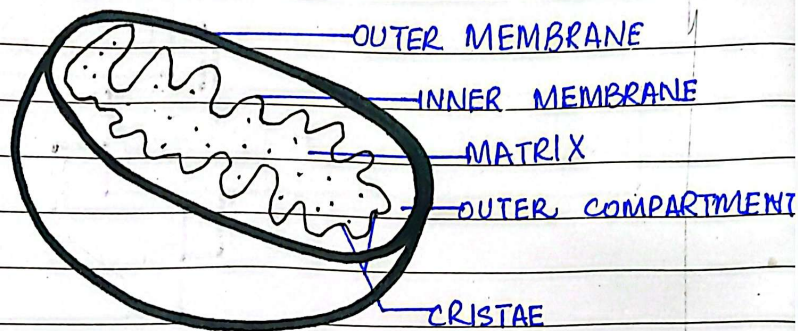


Cells in organisms form organelles in order to compartmentalize different functions and increasing the efficiency. Different secretions are involved in carrying out different functions. The compartmentalization allows these secretions to remain separate and work more efficiently. It also contribute to efficient and speedy work by division of work among organelles.

Mitochondria In Human Cell

"Mitochondria is also called as powerhouse of the cell, because it is responsible for the generation of energy in the form of ATP through cellular respiration."

Structure of Mitochondria



Functions of Mitochondria

Production of ATPs through cellular respiration (to produce energy)

Regulation of metabolism

Apoptosis or
programmed
cell death

Production of
heat to control
body temperature

Calcium
storage

(b) Defining Doping

"It is the process of adding small amounts of impurities to a pure semiconductor to improve its electrical conductivity."

Types of Semiconductors

1. Intrinsic Semiconductor

It is a pure semiconductor with no added impurities. Eg: Germanium, Silicon, etc. It has low conductivity which depends upon temperature variation.

2. Extrinsic Semiconductor

It is a semiconductor doped with controlled impurities to increase conductivity. It is further classified into:

- a. N-type : It is doped with pentavalent elements.
- b. P-type : It is doped with trivalent elements.

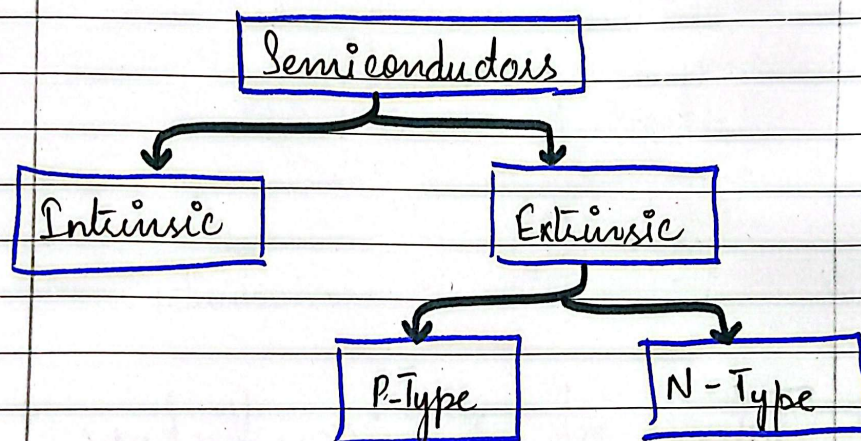


fig: Classification of semiconductors

c) Volcanic Eruptions: Merits and Demerits

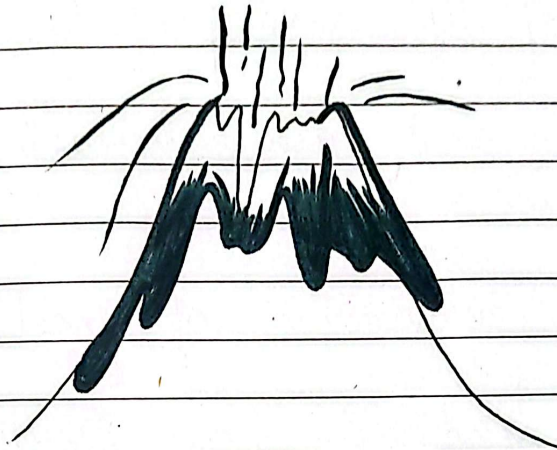


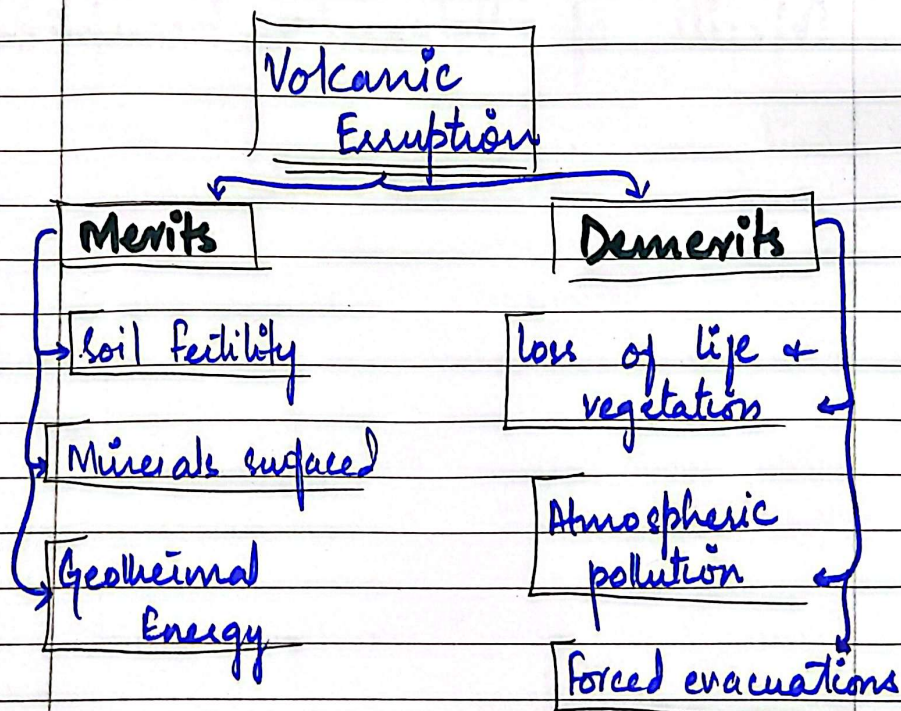
Fig: visual representation of a volcanic eruption

Merits of Volcanic Eruption

1. Soil Fertility: Volcanic ash and lava break into mineral rich soil.
2. Mineral Resources: Eruptions bring important minerals to the surface.
3. Geothermal Energy: They provide a renewable source of geothermal energy.
4. New land formation: Lava solidifies into new lands and islands. e.g. Hawaii.

Demerits of Volcanic Eruptions are:

- 1- Loss of life and property.
- 2- Gases and ash increasing air pollution.
- 3- Forced evacuation of local masses.
- 4- Lava and ash from eruptions can cause destruction of vegetation and contamination of water sources.



(d) Dengue: Symptoms, Causes and Remedies

"Dengue is a viral disease transmitted to humans through the bite of female *Aedes aegypti* mosquito. It is a common viral infection in tropical and subtropical regions."

Symptoms of Dengue are:

- 1- High grade fever (104°F or more)
- 2- Severe headache and pain behind eyes
- 3- Joint and muscle fatigue.
- 4- Nausea and vomiting.
- 5- Skin rash
- 6- Low platelet count.

Causative Agents of Dengue are:

- 1- Dengue virus (DENV)
- 2- Four strains of DENV ie; DENV-1, DENV-2, DENV-3, and DENV-4.

Remedies and Treatments include:

- 1- No specific antiviral treatment.
- 2- Symptomatic treatment only.
- 3- Rest and rehydration.
- 4- Paracetamol to contain body temperature.

Q. NO. 05

(a) Causes of Population Explosion In Pakistan:

Pakistan is the 5th most populous country in the world with rapid population growth straining its development and resources. Following are some of the causes for it:

High birth rate due to early marriages and large family structures in culture.

Lack of literacy and awareness among masses - no family planning

Poor families tend to bear more children for economic support.

Misconception that family planning is unethical.

Measures to Control Population Growth in Pakistan

Educating masses on family planning and reproductive health.

Encouraging women empowerment may delay early marriages

Introducing affordable contraceptives in the market.

Engage religious scholars in guiding the populace about misinterpretation of religious education.

(b) Remote Sensing

"Remote sensing is the science of collecting information about the Earth's surface without actual physical contact using different sensors."

Role Of GIS

In Environmental Science Is :

→ It monitors environment by tracking changes in land use, deforestation, and pollution over time.

→ It works in disaster management by predicting earthquakes and floods, etc.

→ It helps in resource management (natural resources).

→ It helps in determining climate change by mapping weather conditions.

(c) Atmosphere Is The Blanket Of Earth

"Atmosphere is the blanket of earth: this phrase is usually said to mean that atmosphere acts as a shield for earth and protects it against external harm."

Justifying the Phrase through Evidences

The atmosphere blocks the UV rays from sun from harming the life on earth.

It traps gases like CO_2 and water vapour, maintaining the temperature of earth.

It provides O_2
for supporting
life on earth
and CO_2 for
plants to carry
out photosynthesis

It enables cloud
formation by trap-
ping the vapours
thereby regulating
water cycle on the
planet.

(d) Define the terms:

Hydrometer →

An instrument
used to measure
the relative dens-
ity of the liquids.

The point on earth's
surface directly
above the focus
of an earthquake.

← **Epicenter**

**Eye Wall
of Cyclone** →

The circular ring of dense clouds surrounding the eye of a cyclone which contains the strongest winds and heaviest rainfall.

It refers to an earthquake that occurs at a focus deeper than 300km depth in the earth

← **Deep Focus**

Light Year →

It is the astronomical unit of distance which is equal to the distance light travels in one year. ~ 9.6 trillions kms.

SECTION-II

Q.No. 06

(a) Data Given:

$$\text{Apple} : \text{Berry} : \text{Cherry} : \text{Date} = 3 : 6 : 2 : 5$$

common multiplying factor = x

$$\text{Apple} = 3x$$

$$\text{Berry} = 6x$$

$$\text{Cherry} = 2x$$

$$\text{Date} = 5x$$

Condition given;

$$\text{Apple} = 5x + 35$$

or,

$$3x = 5x + 35$$

Required :

How many Berry Candies:?

Solution:

Solve for x :

$$3x = 5x + 35$$

$$5x - 3x = -35$$

$$2x = -35 / 2$$

$$x = -17.5 \text{ (since apple candies exceed by 35, -ve quotient can be ignored)}$$

$$\therefore x = 17.5$$

Hence,

$$\text{Berry candies} = 6 \times 17.5$$

and

$$= 105 \text{ candies}$$

$$\begin{array}{r} 17.5 \\ \times 6 \\ \hline 105.0 \end{array}$$

(b) Data Given:

Price of camera = 200 \$

Discount = 25% off

Tax = 6%

Required:

Amount paid = ?

Solution:

for determining discounted price;

$$\text{Discount} = \frac{200}{100} \times 25$$

$$\text{Discount} = 50 \$$$

$$\text{Discounted price} = 200 - 50$$

$$= 150 \$ \rightarrow (1)$$

But,

$$\text{Tax paid} = \frac{200}{100} \times 6$$

$$\text{Paid Tax} = 12 \$ \rightarrow (2)$$

$$\therefore \text{Paid amount} = 150 - 12$$

$$= 162 \$$$

(c)

Data Given:

Distance covered = 36 km.

velocity of bicycle = 18 km/h

start time = 1 pm.

Required:

Time after covering distance = ?

Solution: $\therefore$ speed is 18 km/h

Total time required

to cover the distance $\Rightarrow \frac{36}{18}$
of 36 km can be
given as (in hours)

Time (in hours) = 2 hours.

Hence, bicycle shall reach the destination by 3 pm.

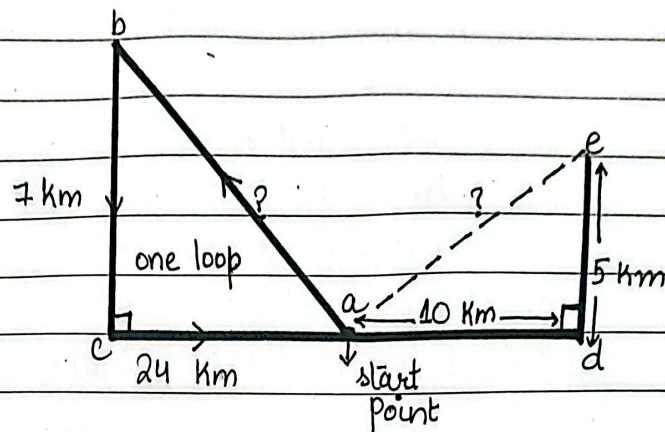
1d) unscramble the terms:

1- STST AICITS

STATISTICS

2- LGEBMAR

GAMBLER.

Q.NO.08**(a) Data Given:****Required:**

Total distance covered = ?

Distance from start point = ?

Solution:

$$\text{Total distance} = ab + bc + ca + ad + de.$$

$$= ab + 07 + 24 + 10 + 05 \rightarrow \textcircled{1}$$

∴ for right triangle;

$$H^2 = P^2 + B^2.$$

$$\therefore ab^2 = bc^2 + ca^2$$

$$ab^2 = (07)^2 + (24)^2$$

$$ab^2 = 49 + 576$$

$$ab^2 = 625$$

Taking $\sqrt{\quad}$ on both sides:

$$\sqrt{ab^2} = \sqrt{625}$$

$$\therefore ab = 25$$

$$\begin{array}{r} 24 \\ 24 \\ \hline 49 \\ 248 \\ \hline 1576 \\ 49 \\ \hline 625 \end{array}$$

$\therefore$ eq ① becomes;

$$\text{Total distance} = 25 + 01 + 24 + 10 + 05$$

$$\boxed{\text{Total dist.} = 71 \text{ km}}$$

Now, distance from starting point;

i.e: ae ;

$$ae^2 = ad^2 + de^2$$

$$ae^2 = 10^2 + 5^2$$

$$ae^2 = 100 + 25$$

$$ae^2 = 125$$

Taking $\sqrt{\quad}$ on both sides;

$$\sqrt{ae^2} = \sqrt{125}$$

$\therefore$

$$\boxed{ae = 11.2 \text{ km}}$$

Hence total distance covered by the hiker is 71 km and distance from starting point is 11.2 km

$$\begin{array}{r} 11.2 \\ 11.2 \\ \hline 224 \\ 112 \times \\ 112 \times \times \\ \hline 125.44 \end{array}$$

Date: _____

(b)

Data Given:

no. of Siblings = 06.

Amount = 9000 RS.

$$A = \frac{1}{2} B$$

$$B = 3C$$

$$C = 4D$$

$$D = 2E$$

$$E = F$$

$$\begin{array}{r} 1125 \\ 2250 \\ 4500 \\ 9000 \\ 1125 \\ 2250 \\ 4500 \\ 9000 \\ 1125 \\ 2250 \\ 4500 \\ 9000 \\ 1125 \\ 2250 \\ 4500 \\ 9000 \end{array}$$

Required:

Share of each:?

Solution:

$$\therefore A + B + C + D + E + F = 9000 \text{ RS} \rightarrow (1)$$

From the given data;

$$E = F \quad 187.5 \quad 187.5$$

$$D = 2E = 2F \quad 375$$

$$C = 4D = 8E = 8F \quad 1500$$

$$B = 3C = 12D = 24E = 24F \quad 4500$$

$$A = \frac{1}{2} B = \frac{3C}{2} = \frac{12D}{2} = \frac{24E}{2} = \frac{24F}{2} \quad 2250$$

writing eq. 1 again; it becomes;

$$\frac{24F}{2} + 24F + 8F + 2F + F + F = 9000$$

$$12F + 24F + 8F + 4F = 9000$$

$$48F = 9000 ; F = \frac{9000}{48}$$

$$F = 187.5 \text{ RS.}$$

Date: _____

$$\therefore E = F$$

$$\therefore E = 187.5 \text{ RS.}$$

$$D = 2F$$

$$D = 2 \times 187.5$$

$$\therefore D = 375 \text{ RS.}$$

$$C = 8F$$

$$C = 8 \times 187.5$$

$$\therefore C = 1500 \text{ RS.}$$

$$B = 24F$$

$$B = 24 \times 187.5$$

$$\therefore B = 4500 \text{ RS}$$

$$A = \frac{24F}{2}$$

$$A = \frac{24 \times 187.5}{2}$$

$$\therefore A = 2250 \text{ RS.}$$

To Verify, let's add all the amounts;

$$187.5 + 187.5 + 375 + 1500 + 4500 + 2250 = 9000 \text{ RS}$$

Hence, the shares of siblings are;

$$A = 2250 \text{ RS.} \quad D = 375 \text{ RS.}$$

$$B = 4500 \text{ RS.} \quad E = 187.5 \text{ RS.}$$

$$C = 1500 \text{ RS.} \quad F = 187.5 \text{ RS.}$$

(c) Data Given:

Rectangular box.

$l = 8 \text{ m}$

$w = 6 \text{ m}$

$h = 4 \text{ m}$

Required:

Total surface area = ?

Volume of box = ?

Solution:

Total surface area of rectangle $= 2(lw + hw + hl)$

$$= 2\{8 \times 6 + (4 \times 6) + (4 \times 8)\}$$

$$= 2\{48 + 24 + 32\}$$

$$= 2 \times 104$$

$$\therefore \boxed{\text{TSA} = 208 \text{ m}^2}$$

$$\begin{array}{r} 24 \\ 32 \\ \hline 56 \\ 48 \\ \hline 104 \\ 104 \\ \hline 208 \end{array}$$

now,

Volume $= l \times w \times h$

$V = 8 \times 6 \times 4$

$$\therefore \boxed{V = 192 \text{ m}^3}$$

$$\begin{array}{r} 48 \\ 4 \\ \hline 192 \end{array}$$

(d) Data Given:

family members = 08
 average: men eat = 72 kg of food
 average: women eat = 50 kg of food.
 Anna joined;
 new average consumption = 67 kgs.

Required:

food Anna ate = ? (in kgs).

Solution:

Average of overall = $\frac{\text{men} + \text{women}}{2}$
 family =

$$= \frac{72 + 50}{2}$$

$$= \frac{122}{2} = 61$$

$$\therefore = 61 \text{ kgs.}$$

Avg. after Anna = $\frac{\text{family} + \text{Anna}}{2}$

$$67 = \frac{61 + \text{Anna}}{2}$$

$$61 + \text{Anna} = 67 \times 2$$

$$\text{Anna} = 134 - 61$$

$$\therefore \boxed{\text{Anna} = 73 \text{ kgs}}$$

$$\begin{array}{r} 67 \\ 67 \\ \hline 134 \\ 61 \\ \hline 73 \end{array}$$

Thus, Anna ate 73 kgs of food.