

(1)

Part II

(SECTION I)

QNO: 3

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

Ans.

Cells form organelles to work more efficiently and stay organized.

By creating separate compartments inside themselves, cells can perform many different tasks at the same time without mixing things up.

Each organelle has a specific job-like producing energy, making proteins, or removing waste etc. In simple words, organelles help cells manage their work better.

⇒ Mitochondria :

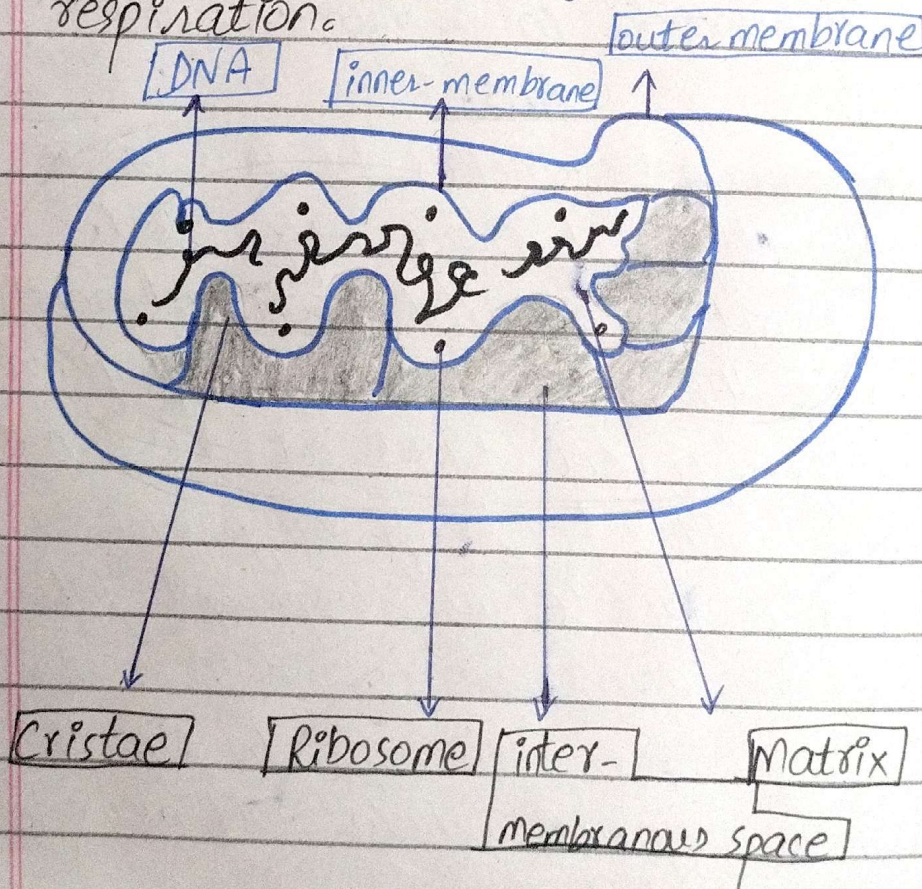
- Mitochondria is the **Power house** of the cell.
- It is found in all eukaryotic cells.
- It has major role in the production of **ATP** from **ADP**

(2)

- It is the self replicating organelle.
- It has two membranes.

Outer and Inner

- Inner contain foldings called **cristae**
- It extract energy from food.
- It is the ~~sid~~ site of cellular respiration.



(b) What is doping? Discuss different types of semi-conductors.

Doping:

- Doping is the use of ~~illegal~~ ^{illegal} substances or techniques to improve human performance.

(3)

- It may include use of steroids, stimulants or blood boosting techniques that gives athletes an unfair advantage.

Semi-conductors:

- It is a material that has electrical conductivity between that of a conductor and insulator.
- It conduct electricity under certain conditions but not always.

Types:

1. Intrinsic Semi-conductor:

- It is a pure semi-conductor like Silicon and Germanium.

2. Extrinsic Semi-conductor:

- It has been mixed with a small amount of impurity.
- It has two main types n-type and p-type.

↓
carries -ve
charge

↓
carries +ve
charge.

(4)

c. State some of the merits and demerits of volcanic eruption.

Volcano Eruption:

A volcano eruption is the sudden release of magma (molten rock), gases and ash from deep inside the Earth through an opening called a volcano. It is the Earth's way of releasing internal heat and pressure.

Merits:

It has some merits like:

- It brings valuable minerals like copper, gold and silver to the surface which can be mined.
- Heat from volcanic areas can be used to produce renewable geothermal energy.

Demerits:

It has demerits like:

- Loss of life and property
- Climate impact
- Environmental damage
- Disruption of economy

(5)

d- What is dengue? Discuss symptomology, causative agents and remedies.

Dengue:

It is a viral infection spread by the bite of an infected Aedes mosquito. It mostly occurs in warm and humid areas and is sometimes called 'breakbone fever'.

Symptoms:

- The patient suffers from the sudden high fever.
- He feels severe headache, joint pain, muscle pain and pain behind the eyes.
- He gets skin rashes.
- He also feels nausea.
- Patient's gums and nose bleed sometimes.

Causes:

- It is caused by the bite of an infected Aedes mosquito.
- Poor sanitation and standing water help mosquitoes breed fast.

(6)

Remedies :

- Intake of juices help recovery.
- Use mosquito repellents and nets.
- In severe cases, hospital care is needed to manage dehydration and bleeding.
- For temperature panadol can be taken.
- Proper sanitation should be ensured.

Q#5

a- Pakistan is the fifth most populous country of the world. What are the causes of population explosion in Pakistan? What can be the control measures?

Pakistan ranked fifth in the most populous countries of the world. There are certain **causes** of this population explosion which include :

- Lack of family planning
- Lack of education
- Lack of knowledge about birth control things.

(7)

- Birth rate is more than death rate.
- Early marriages ^{are} ~~is~~ also a major cause.

Control measures:

- People should be educated about the bad impacts of population increase.
- Govt. should create mobile application in local language that provide free guidance, reminders for contraceptives and connect women to nearby clinics confidentially.
- Govt. should make sure to use population control van or mobile units to visit remote areas regularly to spread awareness and also offer free counseling and contraceptives.

b) What is remote sensing? Discuss role of GIS in environmental science.

Remote Sensing:

Remote sensing is a technology used to collect information about the Earth's surface without physically touching it. It is mainly

(8)

done through satellites, drones, or aircrafts that captures images and data using sensors.

GIS :

→ It stands for Geographic Information system. It is computer based system that stores, analyzes and displays geographic data collected through remote sensing and other sources.

Role:

- It helps to connect information with location. For example; showing where floods occur, where forests are shrinking or where new roads can be built.
- Remote sensing collects the raw data ; GIS processes and interprets that data to making useful decision.
- GIS also helps in urban planning, disaster management, and environmental monitoring.
- Remote sensing and GIS together play a vital role in sustainable development and environmental management.

(9)

c- "The Atmosphere is the blanket of Earth." Justify with your opinion.

The Atmosphere is the blanket of Earth because it covers the Earth and protect her from harmful radiation like UV rays. It also traps some heat through the green-house effect. This keeps the planet's temperature moderate. Atmosphere also protect Earth from space objects like meteoroids and debris so we can surely say that atmosphere is Earth's blanket, shield, regular and life support system. Without atmosphere, there would be no weather, no breathable air, and no life on Earth.

d- Define the following terms:
Hydrometer, Epicenter, Eye
wall of cyclone, Deep focus.

(10)

Hydrometer:

→ It is used to measure the density or specific gravity of liquids.

Epicenter:

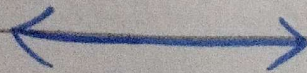
→ It is the surface point right above where an earthquake begins underground.

Eye wall of cyclone:

→ The eye wall is the most dangerous part of a cyclone. It produces ~~the~~ strongest winds and heaviest rains.

Deep focus:

→ A deep focus earthquake starts very deep inside the Earth, not near the surface, and is usually less damaging because most of its energy is absorbed before reaching the ground.



(11)

SECTION # 2

Q#6

a) Solution:

Apple : Berry : Cherry : Date
3 : 6 : 2 : 5

Let the common multiply factor be 'x'

$$\text{Apple} = 3x \quad ; \text{Cherry} = 2x$$

$$\text{Berry} = 6x \quad ; \text{Date} = 5x$$

→ Apples candies exceed date candies by 35 so,

$$3x - 5x = 35$$

$$-2x = 35$$

Taking absolute value because exceed means $\text{Apple} > \text{Date}$

$$2x = 35$$

$$\boxed{x = 17.5}$$

So,

$$\begin{aligned} \text{Berry} &= 6x = 6 \times 17.5 \\ &= \boxed{105} \end{aligned}$$

There are 105 Berry candies



(12)

b- Solution:

$$\text{Original price} = \$200$$

$$25\% \text{ discount} =$$

$$= \frac{25\% \text{ of } 200}{100} \times 200$$

$$= 50$$

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

$$= \$150$$

$$6\% \text{ sales tax on the discounted price} = \frac{6}{100} \times 150$$

$$= \$9$$

$$\text{Total amount paid} = \$150 + \$9$$

$$= \boxed{\$159}$$

c- Solution:

$$\text{Distance} = 36 \text{ km}$$

$$\text{Speed} = 18 \text{ km/hr}$$

$$\text{start time} = 1:00 \text{ pm}$$

Time Taken:

$$\text{Time} = \frac{\text{Distance}}{\text{speed}}$$

$$= \frac{36}{18}$$

(13)

= 2 hours

Add to starting time:

$$1:00 \text{ pm} + 2 \text{ hours} = 3:00 \text{ pm}$$

→ The by bicycle reaches at 3:00 pm

d- Unscramble these maths terms

i- STSTAICITS

Statistics

ii- LGEBMAR

GAMBLER

Q# 7

(a) Solution:

Diameter = 14 cm

$$\text{Radius } r = d/2 = 14/2 = 7 \text{ cm}$$

Formulae for volume of sphere:

$$V = \frac{4}{3} \pi r^3$$

$$V = \frac{4 \times 22}{3 \times 7} \times (7)^3$$

$$V = \frac{4}{3} \times \frac{22}{7} \times 343$$

$$= \frac{4 \times 107}{3}$$

$$= \frac{4312}{3} = 1437.33$$

$$\text{volume of sphere} = \frac{4312}{3} = \boxed{1437.33 \text{ cm}^3}$$

(14)

b) Solution:

Total savings = 25000 Rs

Ratio = 1 : 2 : 3 : 4 : 5

Let's sum ratios:

$$1 + 2 + 3 + 4 + 5 = 15$$

$$\text{One part} = \frac{25000}{15} = 1,666.67$$

Smallest share:

Smallest ratio = 1

$$1 \times 1666.67 = 1666.67$$

So the smallest share is approximately 1666.67 Rs

c) ~~1~~ (1)

All numbers fit. Each term is multiplied by 3 to get the next term.

$$2 \times 3 = 6$$

$$6 \times 3 = 18$$

$$18 \times 3 = 54$$

$$54 \times 3 = 162$$

$$162 \times 3 = 486$$

(15)

ii) 3, 5, 7, 11, 13, —

They are all prime number
on which only one and
its own table go.

The series will be:

3, 5, 7, 11, 13, 17, 19 ---

