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Part - II

Q2-

2)

Ans:-

Components of cell:-

A cell consists of three main components.

- Plasma membrane
- Cytoplasm
- Nucleus (only in eukaryotes)

Functions of components of cell:-

Plasma membrane:-

It is a semi permeable membrane that regulates passage of substances in and out of cell. They also prevent loss of important molecules from cell.

Cytoplasm:-

It is a jelly like structure that provides nutrients to cell as well as keep intracellular organelles in place.

Nucleus:-

It is membrane covered structure

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that provides contains genetic material of cell

Types of cells:-

Cells are divided into two types prokaryotic and Eukaryotic cells.

Difference b/w Eukaryotic and Prokaryotic cells:-

In prokaryotic cells nucleus is absent. while in eukaryotic cells it is prominently in middle of cell. Prokaryotic cells are in algae, Bacteria and reproduce asexually while eukaryotic cells are in animals and plants and can reproduce both sexually and asexually.

Response to external stimuli:-

Cells constantly monitor and respond to external stimuli to maintain homeostasis. cells use chemical signals to detect external changes and give appropriate response such as releasing chemicals or hormones or doing mechanical activities to maintain homeostasis.

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b) How mobile works:-

Mobile phone works as both a receiver and transmitter of radio signals which are connected to cellular networks.

It use technologies such as Radiosignals, wifi, Bluetooth and wireless generation (4G)

Advantages of mobile phones:-

Cell phones have many advantages such as:

- Constant connectivity to loved ones
- Access to learning platforms
- Multi functional tools and convenience

Disadvantages of mobile phones:-

Here are major disadvantages of phones:-

- Privacy concerns
- Reduced face to face interactions
- Distraction from work and education

Impact on communication and access of Information:-

Mobiles have changed the

the domain when it comes to communication. Some goes for access of information. The information has been readily available from multiple sources at a tap of button all thanks to mobile phones.

C. Layers of Earth-

The earth has 4 major layers.

- Inner core
- Outer core
- Mantle
- Crust



These layers are very inter connected and are responsible for tectonic plate movements as well as mountain formation.

Earth's water cycle:-

The earth's water cycle has five steps

1- Evaporation

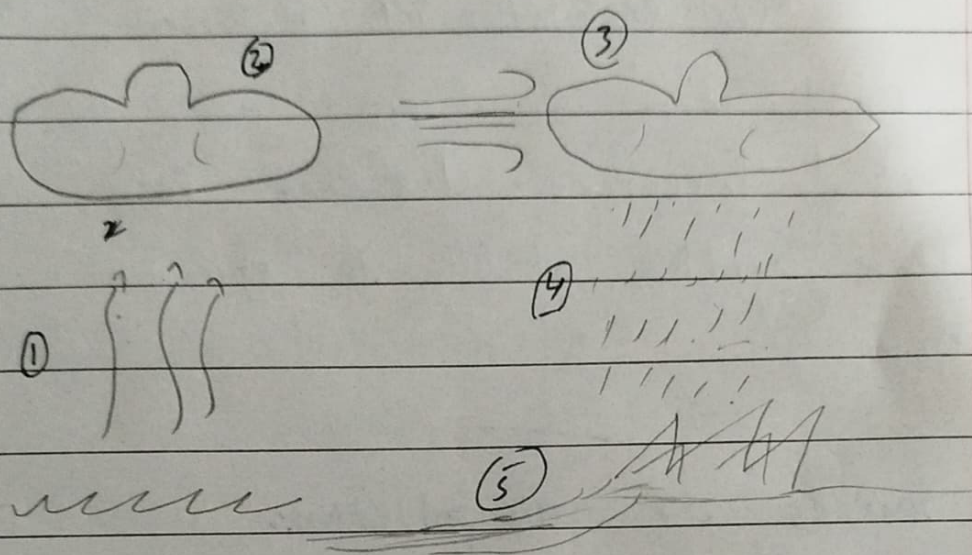
2- Transpiration

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3- condensation

4- Precipitation

5- collection.



(1) Water from ocean evaporates
when water is also released by plants.

(2) This water condense in air
and result in cloud formation.

(3) When clouds become heavy this
water precipitate down and is

(4) collected in rivers and lakes.

Impact of human activities

Human activities have
resulted in a lot of negative
impacts on ecosystem and resources.

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- Climate change
- Habitat loss
- Bio diversity loss
- Pollution
- Over exploitation of resources

right now we are using the natural resources 1.8 times faster than earth's ability to replenish them

Sources of air pollution:-

Here are major sources of air pollution.

- Fossil fuels
- Green house gases
- Industrial emission
- Agricultural emission
- Vehical emission
- Domestic emission
- Wild fires

Effects of air pollution:-

Air pollution have many impacts on human health such as

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COPD, CVDs as well as many hematological disorders. They can even cause cancer. Similarly the air pollution is destroying environment in form of environmental degradation and acid rain.

Primary pollutants:

Pollutants directly responsible for environmental degradation are known as primary pollutants. e.g. CO , SO_2 etc.

Secondary pollutants:

They are products of chemical reactions b/w primary pollutants e.g. H_2SO_4 is ~~primary~~ secondary pollutant which is produced by SO_2 's reaction with H_2O .

How to reduce pollution:

we can reduce air pollution by making eco friendly decisions and to conserve energy as well as by taking collective actions.

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Q4:-

a) Fiber optic:-

Fiber optics are thin fibers made from glass in such a way that they achieve total internal reflection. Fiber optics have two parts: cladding and core.

Advantages:-

Fiber optics are much better than copper wire due to following reasons:-

- Faster transmission.
- Transmission over longer distance
- No interference or noise
- Secure than copper wires
- High amount of data transfer

High speed data transmission:-

The main edge of optic fibers is that they use light to transmit signals which makes them quick. The loss of signals is also minimal as well as maximum signal carrying capacity, which makes

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high speed data transmission breeze.

b)

Causes of Earthquake

These are major cause of earth quakes are collisions of tectonic plates. Some times human activities as large scale dams make earth more susceptible for earthquakes.

Effects of Earthquake:-

Here are major effects of earth quakes:-

- loss of human lives
- loss of houses, buildings and other Infrastructure.
- Habitat loss
- land slidings, tsunamis etc.

Types of seismic waves:-

1- Body waves:-

They are deep waves which have two types

- a) P-waves: They are fastest waves and can travel through any state of matter

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b) S-waves:- They have side to side motion. They are result of p-waves and can only move through solids.

2- Surface waves:-

They are slow waves on surface of earth but they have high amplitude and destruction capacity.

a) Rayleigh waves:- They cause rolling motion on Earth.

b) Love waves:- They cause shearing motion along ground.

Reduction of Impact:-

The impact of earthquakes can be mitigated by using ductile materials as well as using flexible base isolation model during construction.

Similarly by doing geological surveys before making cities will also help in reducing impact of earthquakes.

Planting more trees and avoiding large scale dams on tectonic plate junction can also help.

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c):- Balanced diet:-

The diet that contains food from all major food groups. It varies for age, gender, and physical activities.

Importance:-

It is essential for maintaining good health as deficiency in any food group can lead to serious problems. Similarly, overconsumption can cause many disorders.

Importance of micro and Macro nutrients.

The micronutrients are required in minor quantity while macronutrients are required in major quantity.

Macronutrients provide and fulfill energy requirements while micronutrients are responsible for many critical reactions in the body.

How it prevents from chronic disease:-

A lot of chronic diseases are due to bad dietary choices.

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over the years. A balance diet help mitigate chances of obesity, diabetes, Heart disease and growth related disease

d) Effects of water pollution: -

Water pollution is caused by industrial, sewage wastage. It is also caused by agricultural waste etc.

The water pollution is responsible for environmental degradation, loss of habitat, biodiversity loss and food chain imbalance.

Impact on health:-

Polluted water cause many disease like cholera in humans. The polluted water also cause kidney and liver damage. It is also responsible for environmental erosion

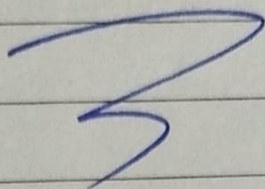
Prevention:-

Water pollution can be prevented by.

- water treatment plants
- Responsible agricultural practices

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- reduce, reuse, recycle.
- water disposal systems.



Section - 11

Q5.

a) Sum of 3 prime numbers is 187.

$$\frac{187}{3} = 63.3$$

prime number closest to 63.3

$$= 59 + 61 + 67 = 187$$

59, 61, 67

b) a positive number when increased by 17 is equal to 60 times reciprocal of number.

$$x = ?$$

$$x + 17 = \frac{60}{x}$$

$$x^2 + 17x = 60$$

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$$x^2 + 17x - 60 = 0$$

by using quadratic equation

$$(x+20)(x-3) = x^2 + 17x - 60 = 0$$

$$x+20=0$$

$$x-3=0$$

$$x=-20$$

$$x=+3$$

Since answer is positive number

$$x=3$$

c)

~~Average~~ ^{Total} Increase = final population -
initial population

$$= 262500 - 17500 = 87500$$

Population Increase for decade

$$= \frac{87500}{17500} \times 100 = 50\%$$

Factor in decade .

$$\frac{50\%}{10} = 5\%$$

annual population increase is 5%.

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d)

$$\text{cost} = 375 \text{ per dozen}$$

$$\text{total eggs} = 20 \text{ dozen} = 20 \times 12 = 240$$

$$\text{selling price} = 33 \text{ per egg}$$

$$\text{total selling price} = 33 \times 240 = 7920$$

$$\text{Total cost} = 375 \times 12 = 4500$$

$$\text{Profit} = 7920 - 4500 = 3420$$

$$\therefore \text{profit} = \frac{3420}{4500} \times 100$$

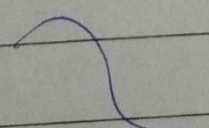
$$= 0.56 \times 100$$

$$= 56\%$$

Q 7:-

$$a) \quad y = t + 2$$

$$(10t + y)(t + y) = 144$$

$$10t^2 + 40t + 4t + 16 = 144$$


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6) Find missing terms:-

$$1- 53, 53, 40, 40, 27, 27, \dots$$

✓ ✓ ✓ ✓ ✓ ✓
0 13 0 13 0 13

$$27 - 13 = 14$$

$$2- 14, 28, 20, 40, 32, 64, \dots$$

✓ ✓ ✓ ✓ ✓
 $2x - 8$ $2x$ $2x - 8$ $2x$

The sequence is multiply by 2 then subtract 8.

$$64 - 8 = \underline{56}$$

3-

$$4- B, F, R, \dots$$

$$\begin{array}{ccc} 2 & 6 & 18 \\ \swarrow & \searrow & \\ 4 & 12 & \end{array}$$

$$B - F = 4, \quad R - F = 12, \quad R - X = 16 + 18 = 36 = 26 + 10 = H$$

$$B, F, R, H.$$

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V = V, U, W, V, K, W, ...

= two step ^{forward} back one step back.

V, K, W, V, K, W, Y

d) ∴

F = age of Father

S = age of Son

10 years ago.

$$F-10 = 3(S-10) \quad \text{--- (1)}$$

Now ten years hence:-

$$F+10 = 2(S+10) \quad \text{--- (2)}$$

find ratio = ?

$$F : S = ?$$

$$F = 3(S-10) + 10 \quad \text{--- (3)}$$

put equation 3 into 2.

~~$$F+10 = 2(S+10) \quad \text{---}$$~~

$$3(S-10)+10 = 2(S+10)$$

$$3S - 30 + 10 = 2S + 10$$

$$3S = 2S + 10 + 20$$

$$3S - 2S = 30$$

$$S = 30 \quad \text{--- } \underline{4}$$

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by putting age of son in
equation (1)

$$F - 10 = 3(30 - 10)$$

$$F - 10 = 60$$

$$F = 60 + 10$$

$$F = 70$$

$$\text{Ratio} = F : S$$

$$= 70 : 30$$

$$= 7 : 3$$

