KPK Tehsildar General Knowledge & Everyday Science All Past Papers Solutions

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[SOLVED] KPK ALL Tehsildar GSA

2007

1. How bats fly in the dark?
2. Explain the process of circulation of blood through the heart?
3. Define the following
   i. Antibiotic
   ii. Gene
   iii. Software
4. What were the special characteristics of Muslims Scientists
5. Write the name of important part of a flower?
6. Explain the pollination and fertilization processes
7. Write a short note on
   i. Water Pollution
   ii. Semi-conductors
8. LASER in form of light energy, how does it differ from in condescend light?

2015

No Question from GK portion

2018

i) Q1) Write comprehensive note on climate change with special reference to Pakistan
ii) Q2)
   (a) Explain the concept of Holy Quran regarding Biodiversity
   (b) Differentiate between Rust and Smut
iii) Q3)
   (a) Discuss TWIN problem of Salinity and water logging in Pakistan
   (b) Describe briefly any two of the following

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    - Explain the concept of the Holy Quran regarding Biodiversity
    - Differentiate between Rust and Smut

- Q3)
    - Discuss TWIN problem of Salinity and water logging in Pakistan
    - Describe briefly any two of the following
    - Temperature inversion ii. Hydrological cycle iii. Solar System

1. Q4)
    - What is thalassemia? Discuss symptoms and causes
    - Explain the structure of cell membrane
2. Q5)
    - Write a note on Guase's law of exclusion principle
    - What do you know understand by NPK?
3. Q6)
    - What is Carbon Sink? Discuss
    - Write a note on soil texture

- Q7) Write all that you know about the BTAP (Billion Tree Afforestation Project) KPK

2020

1. Discuss the solar system and differentiate a star from a planet.

2. Discuss the causes of air pollution and how it can be controlled?
3. Describe human digestive system.
4. Internet brought a revolution in social networking What are the important social
5. networking services freely available and how it facilitates human life?
6. Hepatitis is a viral disease and caused many deaths in Pakistan. How this virus is

spread and how such a patient should be treated?

7. What are the different sources of renew,1ble energy sources?
8. Cell is the basic unit of living organ ism. Discuss the structure of an animal cell.

2021

1. Discuss the causes of the air pollution?
2. What is climate change and what are the consequences of the climate change?
3. Describe the respiratory system in a human body?
4. What do you know about the working system of computer?
5. How antibiotics works?
6. What do you know about vertebrates and invertebrates?
7. Discuss the composition, function and sources of protein?

Solved KPK Tehsildar General Knowledge & Everyday Science All Past Papers

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2007

- **How bats fly in the dark?**

Bats are able to fly in the dark by using echolocation. Echolocation is a biological sonar system that allows bats to navigate and locate prey in their environment by emitting high-pitched sounds and listening for the echoes that bounce back to them.

When a bat emits a call, the sound waves travel through the air and bounce off of objects in the environment. The bat’s highly sensitive ears are able to detect the echoes of these calls

and use the time delay between the emitted call and the returning echo to calculate the distance, size, and shape of the objects in their environment.

This allows bats to navigate and locate prey in complete darkness by creating a “sound map” of their surroundings. Bats are also able to adjust the frequency and intensity of their calls to better suit their needs, such as to locate small, fast-moving insects or to navigate through cluttered spaces.

Overall, the ability to use echolocation allows bats to be highly effective nocturnal hunters and to thrive in a wide range of environments.

- **Explain the process of circulation of blood through the heart?**

The circulatory system is a body-wide network of blood vessels that transports blood, oxygen, and nutrients to the body’s cells and removes waste products. The heart is a muscular organ located in the chest that pumps blood throughout the body. The process of circulation of blood through the heart involves the following steps:

1. Blood from the body enters the right atrium of the heart through the superior and inferior vena cava.
2. The blood flows from the right atrium into the right ventricle through the tricuspid valve.
3. The right ventricle pumps the blood into the lungs, where it picks up oxygen and releases carbon dioxide, through the pulmonary artery.
4. Oxygenated blood from the lungs returns to the left atrium of the heart through the pulmonary veins.
5. The blood flows from the left atrium into the left ventricle through the mitral valve.
6. The left ventricle pumps the oxygenated blood into the aorta, the main artery of the body, which carries the blood to the rest of the body.
7. The blood flows through the arteries, arterioles, and capillaries, delivering oxygen and nutrients to the body’s cells and removing waste products.
8. The blood returns to the right atrium of the heart through the veins, completing the circulatory cycle.

This process is continuously repeated, with the heart pumping blood to the body and the lungs to ensure that the body’s cells receive the oxygen and nutrients they need to function properly.

- **Define the following**
    - **Antibiotic**

Antibiotics are medications that are used to treat infections caused by bacteria. They work by either killing the bacteria or inhibiting their growth, which allows the body's immune system to clear the infection. Antibiotics are often used to treat a wide range of infections, including respiratory tract infections, urinary tract infections, and skin infections.

There are many different types of antibiotics, and each type is effective against certain types of bacteria. It's important to use the right antibiotic to treat a specific infection, as using the wrong antibiotic can lead to the development of antibiotic resistance, which occurs when bacteria become resistant to the effects of the antibiotic. This can make it more difficult to treat the infection, as the bacteria are no longer sensitive to the antibiotic.

Antibiotics are typically prescribed by a healthcare provider, and they should be taken as directed in order to be effective. It's important to finish the full course of treatment, even if you start to feel better, as this helps to ensure that the infection is completely cleared. If you have questions or concerns about taking antibiotics, it's important to speak with a healthcare provider.

- **Gene**

A gene is a unit of heredity that is passed down from parent to offspring and is responsible for the transmission of traits from one generation to the next. Genes are made up of DNA (deoxyribonucleic acid), a complex molecule that contains the instructions for the development and function of living organisms.

Genes are located on chromosomes, which are long strands of DNA that are found within the nucleus of cells. Humans have 23 pairs of chromosomes, with one chromosome in each pair inherited from the mother and the other inherited from the father. Each chromosome contains many genes, and the combination of all of an individual's genes determines their inherited traits, such as their appearance, physical characteristics, and susceptibility to certain diseases.

Genes play a crucial role in the function of the body and are responsible for the expression of traits such as eye color, height, and blood type. They can also influence the development of certain medical conditions, such as certain types of cancer and inherited diseases. Understanding the function and role of genes can help scientists and medical professionals better understand the causes of certain conditions and develop treatments and therapies to address them.

A gene is a unit of heredity that is passed down from parent to offspring and contains the

instructions for the production of a specific protein. Genes are made up of DNA (deoxyribonucleic acid), which is a chemical that stores and transmits genetic information.

Genes are located on structures called chromosomes, which are found in the nucleus of cells. Humans have 23 pairs of chromosomes, for a total of 46 chromosomes. Each chromosome contains many genes, and each gene has a specific location, or locus, on the chromosome.

Genes are responsible for determining an organism's characteristics, such as its physical traits, metabolism, and behavior. For example, genes can determine eye color, hair color, height, and susceptibility to certain diseases. Genes can also be responsible for the production of enzymes, hormones, and other substances that are important for the proper functioning of the body.

Genes can mutate, or change, which can result in variations in an organism's characteristics. These mutations can be passed down to offspring, and they can also be caused by environmental factors, such as exposure to certain chemicals or radiation. Some genetic mutations can be beneficial, while others can have negative effects on an organism's health.

- **Software**

Software is a collection of instructions that tells a computer or other electronic device what to do. It is a program or set of programs that enable a computer to perform specific tasks, such as operating systems, utility programs, and application software.

Software can be classified into two main categories: system software and application software. System software is responsible for controlling and managing the hardware and basic functions of a computer, such as the operating system, device drivers, and utilities. Application software is designed to perform specific tasks, such as word processing, spreadsheet management, and photo editing.

Software is written in programming languages, such as C++ or Java, and it is typically stored on a computer's hard drive or other storage device. It can be installed on a computer by the manufacturer or by the user. Software can also be run from a removable storage device, such as a CD or USB drive.

Software is an important part of modern computing, as it enables computers and other devices to perform a wide range of tasks and functions. It is constantly evolving and being updated to improve performance and add new features.

SOFTWARE IN SIMPLE AND BRIEF DEFINITION

Software is a set of instructions that tells a computer or other electronic device what to do. It enables computers and other devices to perform specific tasks, such as operating systems, utility programs, and application software. Software is written in programming languages and is stored on a computer's hard drive or other storage device. It is an important part of modern computing and is constantly being updated to improve performance and add new features.

- What were the special characteristics of Muslims Scientists

Muslim scientists made significant contributions to the fields of science, technology, and medicine from the 8th to the 16th centuries. During this time, the Islamic world was a center of scientific learning and innovation, and Muslim scientists made important contributions to a wide range of fields, including mathematics, physics, chemistry, astronomy, and medicine.

Some of the special characteristics of Muslim scientists include:

- They were interested in studying and understanding the natural world. Muslim scientists were motivated by a desire to understand how the world worked and to find practical solutions to problems. They were curious and open-minded, and they believed that studying the natural world was a way to learn about and glorify God.
- They had a strong tradition of scientific inquiry. Muslim scientists followed a tradition of scientific inquiry that emphasized observation, experimentation, and the use of reason. They believed that science was a way to discover the truth about the world, and they were willing to challenge traditional beliefs and ideas in order to better understand the natural world.
- They were influenced by Greek and Indian scientific traditions. Muslim scientists built upon the knowledge and ideas of earlier civilizations, such as the Greeks and the Indians, and they made significant contributions to the development of scientific thought.
- They had access to a wide range of scientific texts. During the Islamic Golden Age, Muslim scientists had access to a large number of scientific texts from a variety of sources, including Greek, Indian, and Persian sources. This allowed them to build upon the knowledge of earlier civilizations and to make new discoveries.
- They made important contributions to a wide range of fields. Muslim scientists made significant contributions to many different fields of science, including mathematics, physics, chemistry, astronomy, and medicine. Their work laid the foundations for many of the scientific discoveries and technological innovations of later centuries.
- Write the name of important part of a flower?

A flower is the reproductive structure of angiosperm plants, which are plants that produce seeds enclosed in fruit. The main parts of a flower are:

1. Petals: These are the colorful, often fragrant, modified leaves that are found in the outermost ring of a flower. Petals attract pollinators, such as bees and butterflies, to the flower.
2. Sepals: These are the small, green leaf-like structures that are found at the base of the petals. Sepals help protect the flower bud before it opens.
3. Stamens: These are the male reproductive organs of a flower, consisting of a filament and an anther. The anther produces pollen, which is the male gametes (reproductive cells) of the plant.
4. Pistil: This is the female reproductive organ of a flower, consisting of an ovary, a style, and a stigma. The ovary contains the ovules, which are the female gametes of the plant. The style is a narrow stalk that connects the ovary to the stigma, which is a sticky surface that receives pollen.
5. Receptacle: This is the swollen base of the flower that holds the other parts of the flower in place.

In addition to these main parts, some flowers may also have additional structures, such as nectar glands, which produce a sweet, sugary substance that attracts pollinators, and bracts, which are modified leaves that may be found beneath the sepals or petals.

- **Explain the pollination and fertilization processes**

Pollination and fertilization are important processes in the reproduction of angiosperms, a group of plants that includes most of the flowering plants.

Pollination is the process by which pollen is transferred from the male parts of a flower to the female parts of a flower. Pollen is a fine powder that contains the male reproductive cells of the plant. Pollination can occur through a variety of mechanisms, including wind, water, and animals.

When a pollinator, such as a bee or a butterfly, visits a flower to collect nectar, it brushes against the stamen, which is the male reproductive structure of the flower. The anther, which is the pollen-producing part of the stamen, releases pollen onto the pollinator’s body. The pollinator then brushes against the stigma, which is the sticky tip of the pistil, the female reproductive structure of the flower. The pollen sticks to the stigma and is transferred to the pistil.

Fertilization is the process by which the male and female reproductive cells of a plant are united to produce offspring. In angiosperms, fertilization occurs after pollination, when the pollen germinates on the stigma and grows a pollen tube down through the style to the ovary. The pollen tube contains the male reproductive cells, which are released into the ovary and fertilize the ovules, which are the female reproductive cells of the plant.

Fertilization results in the development of seeds, which will eventually grow into new plants. The fertilized ovules develop into seeds, which are contained within the ovary and surrounded by a protective covering. The seeds are then dispersed, either by wind, animals, or other means, and can germinate and grow into new plants when the conditions are right.

Pollination and fertilization are essential processes in the reproduction of angiosperms, and they play a vital role in the continuation of these plant species.

- Write a short note on
    - Water Pollution

Water pollution is the contamination of water bodies, such as rivers, lakes, oceans, and groundwater, with harmful substances. Water pollution can occur through a variety of sources, including agricultural runoff, sewage, industrial waste, oil spills, and the dumping of chemicals and other pollutants.

Water pollution can have serious consequences for the environment and for human health. Contaminated water can harm or kill aquatic plants and animals, and it can also affect the quality of drinking water. In humans, exposure to contaminated water can cause a variety of health problems, including gastrointestinal illness, skin irritation, and respiratory problems.

There are several types of water pollution, including:

- Chemical pollution: This occurs when harmful chemicals, such as pesticides, fertilizers, and industrial waste, are released into water bodies. These chemicals can be toxic to plants and animals, and they can also contaminate drinking water.
- Biological pollution: This occurs when harmful bacteria, viruses, or other microorganisms are present in water bodies. Biological pollution can occur through the release of sewage or agricultural runoff, and it can cause illness in humans and animals.
- Thermal pollution: This occurs when water is heated to an excessive temperature, which can harm aquatic plants and animals. Thermal pollution can be caused by the discharge of hot water from factories and power plants.
- Nutrient pollution: This occurs when excess nutrients, such as nitrogen and phosphorus,

are present in water bodies. These nutrients can stimulate the growth of algae and other aquatic plants, which can lead to the death of other aquatic life due to a lack of oxygen.

Preventing water pollution is important for the health of the environment and for human health. This can be achieved through the proper treatment and disposal of waste, the use of environmentally-friendly practices in agriculture and industry

Water pollution is the contamination of water bodies, such as lakes, rivers, oceans, and groundwater, with substances that are harmful to humans, animals, and the environment. Water pollution can occur naturally, as a result of events such as volcanic eruptions and algae blooms, or it can be caused by human activities, such as the release of industrial and agricultural waste into water bodies.

There are many different types of water pollution, and they can be caused by a wide range of substances, including chemicals, pathogens, nutrients, and sediment. Some of the common sources of water pollution include:

- Industrial waste: Industrial facilities, such as factories and power plants, can release chemicals and other pollutants into water bodies as a result of their operations.
- Agricultural runoff: Fertilizers and pesticides used in agriculture can run off into water bodies, leading to the contamination of water with these substances.
- Sewage: Sewage, which is the wastewater produced by households and businesses, can contain pathogens and other pollutants that can contaminate water bodies.
- Oil spills: Oil spills can occur as a result of accidents, such as oil tanker spills, and can lead to the contamination of water bodies with oil and other chemicals.

Water pollution can have serious consequences for the environment, including the death of aquatic plants and animals, the destruction of habitats, and the contamination of water sources used for human consumption. It is important to prevent and control water pollution in order to protect the quality of our water resources and the health of the environment.

- Semi-conductors

A semiconductor is a type of material that is intermediate in conductivity between a conductor and an insulator. Semiconductors have the ability to conduct electricity under certain conditions, but they are not as good conductors as metals. They are used in a wide range of electronic devices, including computers, smartphones, and other electronic devices.

Semiconductors are made of elements from the periodic table, such as silicon and germanium,

and they can be either intrinsic or extrinsic. Intrinsic semiconductors are pure elements that have been purified to a high degree, while extrinsic semiconductors are intrinsic semiconductors that have been doped, or intentionally contaminated, with impurities in order to change their electrical properties.

Semiconductors have a number of unique properties that make them useful in the construction of electronic devices. They have a high resistance to the flow of electricity, which makes them useful for controlling the flow of current in circuits. They also have the ability to amplify signals, which makes them useful in the construction of amplifiers.

Semiconductors are used in a wide range of electronic devices, including transistors, diodes, and integrated circuits. They are also used in solar cells, which convert sunlight into electricity, and in LED (light-emitting diode) lights. The development of semiconductor technology has played a major role in the rapid development of electronic devices in recent years.

- LASER in form of light energy, how does it differ from in condescend light?

LASER stands for “Light Amplification by Stimulated Emission of Radiation.” It is a type of light that is produced by a device called a laser, which uses a process called stimulated emission to amplify light and produce a highly focused, intense beam of light.

Laser light differs from ordinary light in several ways:

- Coherence: Laser light is highly coherent, which means that the waves of light are all in phase with each other. This results in a highly focused, intense beam of light that can travel long distances without spreading out or scattering.
- Monochromaticity: Laser light is monochromatic, which means that it consists of a single frequency or color of light. This is in contrast to ordinary light, which is composed of a spectrum of frequencies and colors.
- Directionality: Laser light is highly directional, which means that it travels in a straight line and does not diverge or spread out like ordinary light. This makes it useful for applications such as cutting and welding, where a precise, focused beam of light is required.
- Intensity: Laser light is much more intense than ordinary light. It has a high level of energy and can be used for applications such as laser surgery, where a precise, high-energy beam of light is needed to cut or vaporize tissue.

Laser light has many practical applications, including surgery, manufacturing,

communication, and entertainment.

2015

No Question from GK portion

2018

- Q1) Write comprehensive note on climate change with special reference to Pakistan

Climate change is the long-term alteration of temperature and weather patterns on Earth. It is caused by the increasing concentration of greenhouse gases in the atmosphere, which trap heat from the sun and cause the Earth's average surface temperature to rise. Climate change is a global problem, but it has a disproportionate impact on certain regions, including Pakistan.

Pakistan is one of the countries most vulnerable to the impacts of climate change. It is located in a region that is already prone to extreme weather events, including floods, droughts, and heatwaves. These events are expected to become more frequent and more severe as a result of climate change.

Pakistan is also facing other impacts of climate change, including water shortages, loss of biodiversity, and degradation of ecosystems. The country's agriculture sector is particularly vulnerable to the impacts of climate change, as it is heavily dependent on irrigation, which is being affected by changing rainfall patterns and the depletion of water resources.

Pakistan has taken steps to address climate change and reduce its greenhouse gas emissions. The country has ratified the United Nations Framework Convention on Climate Change (UNFCCC) and has committed to reducing its greenhouse gas emissions by 20% by 2030. It has also implemented a number of initiatives, such as the development of renewable energy sources and the promotion of energy efficiency, to reduce its carbon footprint.

However, addressing climate change will require the efforts of all countries, as well as international cooperation and the implementation of effective policies and measures to reduce greenhouse gas emissions and adapt to the impacts of climate change.

1. Q2)
    - Explain the concept of Holy Quran regarding Biodiversity

The Holy Quran is the central religious text of Islam and is believed by Muslims to be the word

of God as revealed to the Prophet Muhammad. The Quran contains many references to the natural world and the importance of preserving the balance of the environment.

According to the Quran, God has created a diverse and interconnected world, in which everything is interconnected and has a purpose. The Quran states that God has created the earth and all that is on it for the benefit of humans, and that humans have a responsibility to preserve and protect the natural world.

The Quran also emphasizes the importance of biodiversity, stating that God has created a wide variety of living creatures, each with its own unique characteristics and qualities. The Quran advises humans to treat all living creatures with kindness and respect, and to avoid causing harm to them.

In summary, the concept of biodiversity in the Holy Quran is one of respect and stewardship towards the natural world, and a recognition of the interconnectedness and interdependence of all living things. Muslims are encouraged to protect and preserve the natural world and to live in harmony with the environment.

The concept of biodiversity is not explicitly mentioned in the Holy Quran, as the term itself was not coined until the 20th century. However, the Quran does contain many references to the diversity of the natural world and the importance of preserving and protecting it.

One of the main themes of the Quran is the belief in the unity and interconnectedness of all things. The Quran teaches that all living beings, including humans, animals, and plants, are part of a larger system and are dependent on one another for their survival. It also teaches that all living beings are created by God and have a purpose and value in the natural world.

The Quran also contains numerous references to the beauty and diversity of the natural world, and it encourages humans to appreciate and respect the environment. For example, the Quran states that God has created “every kind of thing” (45:13) and that there is “a sign for every people in the things that have been created” (30:22). It also states that God has created “gardens of delight” (18:31) and “paradises” (55:64) on Earth, and that humans should “worship the Lord of this House” (107:3), meaning that they should respect and care for the natural world.

Overall, the concept of biodiversity is consistent with the teachings of the Quran, which emphasize the unity and interconnectedness of all living beings and the importance of preserving and protecting the natural world.

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- Differentiate between Rust and Smut

Rust and smut are both types of plant diseases that can cause significant damage to crops and other plants. However, they are caused by different types of pathogens and have different characteristics.

Rust is a type of fungal disease that affects a wide range of plants, including cereals, grasses, and trees. It is characterized by the appearance of orange, red, or yellow pustules on the leaves, stems, and other plant parts. The pustules contain spores that are spread by wind and can infect other plants. Rust can weaken the plant and reduce its yield, and in severe cases, it can kill the plant.

Smut is another type of fungal disease that affects plants, particularly grasses and cereals. It is characterized by the formation of black, sooty masses on the plant's flowers, leaves, and other parts. The masses contain spores that are spread by wind or by insects, and they can infect other plants. Smut can cause significant yield losses in infected plants, and it is particularly damaging to cereal crops.

In summary, rust and smut are both types of plant diseases that can cause significant damage to crops and other plants. However, they are caused by different types of fungi and have different characteristics. Rust is characterized by the appearance of orange, red, or yellow pustules on the plant, while smut is characterized by the formation of black, sooty masses on the plant.

1. Q3)
    - Discuss TWIN problem of Salinity and water logging in Pakistan

Salinity and water logging are two significant problems facing Pakistan's agriculture sector. These problems are often referred to as the "twin problem" because they often occur together and have similar causes and impacts.

Salinity refers to the high levels of salt in the soil, which can result in reduced crop yields and soil degradation. It is a major problem in Pakistan, particularly in the coastal areas, where the soil is naturally high in salt due to the proximity to the sea. Salinity is also a problem in areas where irrigation water is used excessively or where the water has a high salt content.

Water logging refers to the accumulation of excess water in the soil, which can result in reduced crop yields and soil degradation. It is a common problem in Pakistan, particularly in areas with poor drainage and irrigation systems. Water logging can be caused by excessive

irrigation, poor drainage systems, and heavy rainfall.

Both salinity and water logging can have serious consequences for agriculture in Pakistan. They can reduce crop yields, lead to soil degradation, and increase the risk of crop failures. They also have negative impacts on the environment, including the loss of biodiversity and the degradation of ecosystems.

To address the twin problem of salinity and water logging, Pakistan needs to implement effective policies and measures to improve irrigation and drainage systems, reduce the overuse of irrigation water, and increase the use of saline-tolerant crops. These measures will help to reduce the impact of these problems on agriculture and the environment and ensure the long-term sustainability of the agriculture sector in Pakistan.

- Describe briefly any two of the following
- Temperature inversion

Temperature inversion is a meteorological phenomenon in which a layer of air near the ground is cooler than the air above it. This is the opposite of the usual temperature pattern in the atmosphere, in which the air temperature decreases with increasing altitude.

Temperature inversions can occur under certain weather conditions, such as when there is a high-pressure system in the area or when there is a clear, calm night. They can also be caused by the release of heat and pollutants from industrial and urban areas, which can create a “heat island” effect.

Temperature inversions can have a number of impacts on the environment and human health. They can trap pollutants, such as smog and smoke, near the ground, which can lead to poor air quality and negative health effects. They can also cause fog and frost to form, which can affect visibility and transportation.

Temperature inversions can be disrupted by the mixing of the air layers, which can occur due to wind or the passage of a cold front. However, they can also persist for extended periods of time, particularly in areas with high levels of pollution or urbanization.

In summary, temperature inversion is a meteorological phenomenon in which a layer of air near the ground is cooler than the air above it. It can have a number of impacts on the

environment and human health, including the trapping of pollutants and the formation of fog and frost.

- Hydrological cycle

The hydrological cycle, also known as the water cycle, is the process by which water moves through the Earth's atmosphere, oceans, and land. It involves the evaporation of water from the Earth's surface, the formation of clouds, and the precipitation of water back onto the surface.

The hydrological cycle begins when water from the oceans, lakes, and rivers evaporates into the atmosphere due to the heat of the sun. As the water vapor rises, it cools and condenses into clouds. These clouds are then carried by the wind, and when they reach areas of lower temperature or pressure, they release their water as precipitation, such as rain or snow.

The water that falls as precipitation can either return to the oceans or be absorbed by the land, where it can be used by plants and animals or stored in underground reservoirs called aquifers. Some of the water that falls as precipitation is also stored on the surface of the land, either in rivers, lakes, or wetlands.

The hydrological cycle is an important process that plays a crucial role in the Earth's climate and ecosystems. It is responsible for the distribution of water around the globe and the replenishment of the Earth's water resources. It is also an important factor in the formation of weather patterns and the availability of water for human use.

- Solar System

The solar system is the collection of celestial bodies that orbit the sun, including the eight planets and their moons, as well as dwarf planets, comets, and asteroids. The solar system is located in the Milky Way galaxy and is thought to have formed about 4.6 billion years ago.

The sun is the center of the solar system and is the largest object in the system. It is a massive, luminous ball of gas that is composed primarily of hydrogen and helium. The sun is the primary source of energy for the solar system and is responsible for the majority of the light and heat that reaches the Earth.

The eight planets in the solar system are divided into two categories: the inner planets and the outer planets. The inner planets, which include Mercury, Venus, Earth, and Mars, are small, rocky planets that are located close to the sun. The outer planets, which include Jupiter, Saturn, Uranus, and Neptune, are larger, gas giants that are located farther from the sun.

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In addition to the planets, the solar system also includes a number of smaller celestial bodies, including dwarf planets, comets, and asteroids. These objects are located in the outer regions of the solar system and are thought to be remnants of the material that formed the solar system.

The solar system is an amazing and complex system that has fascinated humans for centuries. It is an important part of the universe and our understanding of the world around us.

1. Q4)
    - What is thalassemia? Discuss symptoms and causes

Thalassemia is a group of inherited blood disorders that affect the body's ability to produce hemoglobin, a protein in red blood cells that carries oxygen throughout the body. There are two main types of thalassemia: alpha thalassemia and beta thalassemia.

Alpha thalassemia is caused by a deficiency in the production of the alpha globin chain of hemoglobin. It is more common in people of African, Southeast Asian, and Mediterranean ancestry. Beta thalassemia is caused by a deficiency in the production of the beta globin chain of hemoglobin. It is more common in people of Mediterranean, African, and Asian ancestry.

Symptoms of thalassemia can vary depending on the severity of the condition, but they may include:

- Anemia: This is a common symptom of thalassemia, as the body does not have enough healthy red blood cells to carry oxygen to the body's tissues. Symptoms of anemia may include fatigue, weakness, pale skin, and shortness of breath.
- Abnormal bone growth: Thalassemia can cause abnormal bone growth in the face, resulting in a distinctive facial appearance. This may include a wide forehead, a round face, and protruding cheekbones.
- Delayed growth and development: Children with thalassemia may experience delayed growth and development, including slow weight gain and short stature.
- Enlarged spleen: Thalassemia can cause the spleen to become enlarged, which can lead to abdominal pain and discomfort.

Thalassemia is caused by mutations in the genes that produce hemoglobin. It is inherited in an autosomal recessive pattern, which means that a person must inherit two copies of the mutated gene (one from each parent) in order to develop the condition. Thalassemia is more common in people of Mediterranean, African, and Asian descent.

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Thalassemia is a serious condition that can be life-threatening if not properly managed. Treatment may include regular blood transfusions, iron chelation therapy, and bone marrow or stem cell transplantation. In some cases, genetic counseling may be recommended for families with a history of thalassemia.

- Explain the structure of cell membrane

The cell membrane, also known as the plasma membrane, is a thin, flexible barrier that surrounds and encloses the cell. It is composed of a double layer of phospholipid molecules, which are arranged in a specific way to form a phospholipid bilayer.

The phospholipid bilayer is made up of two layers of phospholipid molecules, with the hydrophobic (water-fearing) tails facing inward and the hydrophilic (water-loving) heads facing outward. This arrangement creates a semi-permeable barrier that allows some substances to pass through while blocking others.

The cell membrane has a number of important functions, including protecting the cell from its environment, maintaining the cell's shape and structure, and controlling the movement of substances into and out of the cell. It is also involved in communication with other cells and in the attachment of the cell to other cells and to the extracellular matrix.

The cell membrane is dynamic and constantly changes in response to the needs of the cell. It is able to move and reorganize itself, and it is also able to repair itself when damaged.

In summary, the cell membrane is a thin, flexible barrier that surrounds and encloses the cell. It is composed of a phospholipid bilayer and has a number of important functions, including protecting the cell, controlling the movement of substances into and out of the cell, and communicating with other cells. It is dynamic and constantly changes in response to the needs of the cell.

- Q5)
    - Write a note on Guase's law of exclusion principle

The competitive exclusion principle, also known as the "Gause's principle" or the "principle of competitive exclusion," is a biological principle that states that two species cannot occupy the same ecological niche in the same habitat indefinitely. This is because competition for limited resources such as food, space, and mates will eventually lead to the exclusion of one of the species.

The competitive exclusion principle was first proposed by the Russian ecologist Georgii Gause

in the 1930s. He demonstrated that two species of paramecia, which are single-celled organisms, could not coexist in the same environment if they had the same ecological requirements.

The competitive exclusion principle has important implications for the understanding of biodiversity and the evolution of species. It suggests that species must evolve adaptations that allow them to exploit different ecological niches in order to survive and reproduce. This can lead to the development of specialized adaptations, such as differences in feeding habits or reproductive strategies.

In summary, the competitive exclusion principle is a biological principle that states that two species cannot occupy the same ecological niche in the same habitat indefinitely. It has important implications for the understanding of biodiversity and the evolution of species and suggests that species must evolve adaptations to exploit different ecological niches in order to survive and reproduce.

- What do you know understand by NPK?

NPK stands for nitrogen (N), phosphorus (P), and potassium (K), which are three essential nutrients that plants need in order to grow and develop properly. These nutrients are typically found in fertilizers and are labeled with the NPK ratio, which indicates the relative amounts of each nutrient in the fertilizer.

Nitrogen is an essential nutrient for plant growth and is involved in the synthesis of proteins, enzymes, and other important molecules. It is an important component of chlorophyll, which plants use to convert sunlight into energy. Nitrogen is typically applied to plants as a fertilizer to promote leafy growth and to improve the quality and yield of crops.

Phosphorus is another essential nutrient for plant growth and is involved in the synthesis of DNA, RNA, and energy storage molecules. It is also important for root development and the development of flowers and fruit. Phosphorus is typically applied to plants as a fertilizer to promote root growth, flowering, and fruiting.

Potassium is an essential nutrient for plant growth and is involved in the regulation of water balance, the synthesis of proteins and carbohydrates, and the regulation of enzyme activity. It is also important for the development of strong stems and resistance to disease. Potassium is typically applied to plants as a fertilizer to improve the quality and yield of crops.

In summary, NPK refers to nitrogen, phosphorus, and potassium, which are three essential

nutrients that plants need in order to grow and develop properly. These nutrients are typically found in fertilizers and are labeled with the NPK ratio, which indicates the relative amounts of each nutrient in the fertilizer.

- Q6)
    - What is Carbon Sink? Discuss

A carbon sink is a natural or artificial reservoir that absorbs and stores carbon dioxide (CO2) from the atmosphere. Carbon sinks play an important role in regulating the levels of CO2 in the atmosphere and in mitigating the impacts of climate change.

There are two main types of carbon sinks: terrestrial sinks, which are found on land, and ocean sinks, which are found in the oceans. Terrestrial carbon sinks include forests, grasslands, and other vegetated areas, which absorb CO2 through the process of photosynthesis. Ocean carbon sinks include the surface waters of the oceans, which absorb CO2 through a process called the solubility pump, as well as the deep oceans, which absorb CO2 through a process called the biological pump.

Carbon sinks are important because they help to remove excess CO2 from the atmosphere, which would otherwise contribute to climate change. They play a critical role in the global carbon cycle, which is the movement of carbon between the atmosphere, land, and oceans.

However, carbon sinks are not permanent and can be disrupted by a variety of factors, including deforestation, land use change, and climate change. This can reduce the capacity of carbon sinks to absorb and store CO2 and contribute to the accumulation of CO2 in the atmosphere.

In summary, a carbon sink is a natural or artificial reservoir that absorbs and stores CO2 from the atmosphere. Carbon sinks play an important role in regulating the levels of CO2 in the atmosphere and in mitigating the impacts of climate change. There are two main types of carbon sinks: terrestrial sinks, which are found on land, and ocean sinks, which are found in the oceans.

- Write a note on soil texture

Soil texture refers to the relative proportions of sand, silt, and clay in a soil. Soil texture is an important factor in determining the physical and chemical properties of soil, as well as its suitability for growing different types of plants.

Soil texture is typically classified according to the USDA soil textural triangle, which divides soils into twelve different textural classes based on the proportions of sand, silt, and clay. The textural classes range from sands (which are composed largely of sand-sized particles) to clays (which are composed largely of clay-sized particles).

The three main soil textural classes are sands, silts, and clays. Sand-sized particles are the largest and have a diameter of between 0.05 and 2.0 millimeters. Silt-sized particles have a diameter of between 0.002 and 0.05 millimeters. Clay-sized particles are the smallest and have a diameter of less than 0.002 millimeters.

Soil texture is important because it affects the water-holding capacity, nutrient-holding capacity, and drainage of soil. For example, sandy soils have a lower water-holding capacity and are more prone to drought, while clay soils have a higher water-holding capacity and are more prone to waterlogging. Silt soils have intermediate properties between sands and clays.

In summary, soil texture refers to the relative proportions of sand, silt, and clay in a soil. Soil texture is an important factor in determining the physical and chemical properties of soil, as well as its suitability for growing different types of plants.

- Q7) Write all that you know about the BTAP (Billion Tree Afforestation Project) KPK

The Billion Tree Afforestation Project (BTAP) is a reforestation and afforestation project that was launched in 2014 by the government of Khyber Pakhtunkhwa (KPK), a province in Pakistan. The goal of the project is to plant and restore 100 billion trees in the province by 2023, in order to help combat climate change, protect the environment, and promote economic development.

The BTAP is being implemented by the Khyber Pakhtunkhwa Forest Department, with support from various local and international organizations. The project has received funding from the World Bank, the Global Environment Facility, and other donors.

The BTAP aims to plant a variety of tree species, including both native and exotic species, in a range of different ecosystems, including forests, grasslands, and agroforests. The project is also working to restore degraded and deforested lands and to promote the sustainable management of forests.

The BTAP has had significant success in planting and restoring trees in Khyber Pakhtunkhwa. As of 2021, the project has planted over 84 billion trees, which has contributed to a significant increase in forest cover and the conservation of biodiversity in the province.

In summary, the Billion Tree Afforestation Project (BTAP) is a reforestation and afforestation project that was launched in 2014 by the government of Khyber Pakhtunkhwa (KPK), a province in Pakistan. The goal of the project is to plant and restore 100 billion trees in the province by 2023, in order to help combat climate change, protect the environment, and promote economic development. The BTAP has had significant success in planting and restoring trees in Khyber Pakhtunkhwa and has contributed to a significant increase in forest cover and the conservation of biodiversity in the province.

2020

1. Discuss the solar system and differentiate a star from a planet.

The solar system is the collection of celestial objects that orbit around the sun, including the eight planets and their moons, dwarf planets, asteroids, comets, and other small bodies. The solar system also includes the sun, which is a medium-sized star located at the center of the solar system.

A star is a celestial object that is composed of gas and plasma, and that generates energy through nuclear fusion reactions. Stars are the largest and most luminous objects in the universe, and they play a critical role in the evolution of the cosmos. The sun is a star, and it is the primary source of light and heat for the solar system.

A planet is a celestial object that orbits around a star and that is large enough to be spherical in shape due to its own gravitational force. Planets are composed of rock, metal, or gas, and they may have moons or other small bodies orbiting around them. The solar system contains eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune.

There are several key differences between stars and planets. Stars are much larger and more massive than planets, and they generate energy through nuclear fusion reactions. In contrast, planets do not generate their own energy and rely on the energy received from their host star. Stars are also much brighter and more luminous than planets, and they are often visible from great distances in the universe.

In summary, the solar system is the collection of celestial objects that orbit around the sun, including the eight planets and their moons, dwarf planets, asteroids, comets, and other small

bodies. A star is a celestial object that is composed of gas and plasma, and that generates energy through nuclear fusion reactions, while a planet is a celestial object that orbits around a star and that is large enough to be spherical in shape due to its own gravitational force. Stars are much larger and more massive than planets, and they generate energy through nuclear fusion reactions, while planets do not generate their own energy

2. Discuss the causes of air pollution and how it can be controlled?

Air pollution is the presence of harmful substances, such as gases, particulates, and biological molecules, in the Earth's atmosphere. These substances can have detrimental effects on human health, as well as on the natural environment and on the climate.

There are many different causes of air pollution, including human activities and natural sources. Human activities that contribute to air pollution include the burning of fossil fuels (such as coal, oil, and natural gas) for energy, transportation, and industry; agriculture and livestock production; and the use of chemicals and other substances in manufacturing and other processes. Natural sources of air pollution include volcanic eruptions, wildfires, and dust storms.

There are several ways to control and reduce air pollution. Some of the most effective strategies include:

- Reducing the use of fossil fuels and transitioning to clean, renewable energy sources, such as solar and wind power
- Improving fuel efficiency and reducing vehicle emissions through the use of electric and hybrid vehicles and public transportation
- Implementing strict emissions standards and regulations for industries and vehicles
- Promoting energy-efficient practices and technologies in homes, buildings, and other structures
- Protecting and conserving forests and other natural areas, which help to absorb and filter pollutants from the air
- Promoting sustainable agriculture and livestock production practices
- Educating the public about the importance of air quality and ways to reduce air pollution

In summary, air pollution is the presence of harmful substances, such as gases, particulates, and biological molecules, in the Earth's atmosphere. There are many different causes of air pollution, including human activities and natural sources. To control and reduce air pollution, it is important to reduce the use of fossil fuels, improve fuel efficiency and vehicle emissions, implement strict emissions standards and regulations, promote energy-efficient practices and

technologies, protect and conserve natural areas, promote sustainable agriculture and livestock production practices, and educate the public about the importance of air quality.

3. Describe human digestive system.

The human digestive system is a complex system of organs and tissues that work together to break down food, absorb nutrients, and eliminate waste. The main organs of the digestive system include the mouth, esophagus, stomach, small intestine, large intestine, rectum, and anus.

The process of digestion begins in the mouth, where food is mechanically broken down by chewing and mixed with saliva, which contains enzymes that begin to break down food chemically. The chewed and partially digested food, called a bolus, is then swallowed and moves down the esophagus through a process called peristalsis, which is the rhythmic contraction and relaxation of the esophageal muscles.

The stomach is a muscular sac that is located between the esophagus and the small intestine. It stores and mixes food with stomach acid and enzymes, which continue to break down the food chemically. The small intestine is a long, narrow tube that is located between the stomach and the large intestine. It is the main site of nutrient absorption in the body, and it is lined with tiny finger-like projections called villi, which increase the surface area for absorption.

The large intestine is a wider tube that is located between the small intestine and the rectum. It absorbs water and electrolytes from the remaining undigested material and forms the feces, which are eliminated from the body through the rectum and anus.

In summary, the human digestive system is a complex system of organs and tissues that work together to break down food, absorb nutrients, and eliminate waste. The main organs of the digestive system include the mouth, esophagus, stomach, small intestine, large intestine, rectum, and anus. The process of digestion begins in the mouth, and the main site of nutrient absorption is the small intestine. The large intestine absorbs water and electrolytes from the remaining undigested material and forms the feces, which are eliminated from the body through the rectum and anus.

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4. Internet brought a revolution in social networking What are the important social networking services freely available and how it facilitates human life?

Social networking services are online platforms that allow people to connect with each other and share information, ideas, and content. The internet has greatly facilitated the development and growth of social networking services, which have become an integral part of modern life for many people. Some of the most important social networking services that are freely available and their founding dates include:

1. Facebook: Facebook is one of the most popular social networking services in the world, with over 2.7 billion monthly active users. It was founded in 2004 by Mark Zuckerberg and allows users to create a personal profile, connect with friends and family, and share text, photos, videos, and links.
2. Twitter: Twitter is a microblogging platform that was founded in 2006 and allows users to send and read short messages, called tweets, of up to 280 characters. It is a popular platform for sharing news, opinions, and updates in real-time.
3. Instagram: Instagram is a photo and video sharing platform that was founded in 2010 and allows users to take and share pictures and videos, as well as edit and enhance them with filters and other tools. It is particularly popular among younger users.
4. LinkedIn: LinkedIn is a professional networking platform that was founded in 2002 and is used by job seekers, businesses, and professionals to connect with each other and share job opportunities, industry insights, and professional development resources.
5. Reddit: Reddit is a social news and discussion platform that was founded in 2005 and allows users to submit and vote on content, such as links, text posts, and comments. It is organized into topic-specific forums, called subreddits, which cover a wide range of topics.

Social networking services have facilitated human life in a number of ways. They have made it easier for people to connect with each other and stay in touch, regardless of their location. They have also provided a platform for people to share and discover new information and ideas. In addition, social networking services have created new opportunities for businesses to connect with customers and promote their products and services. Finally, social networking services have enabled people to participate in online communities and engage in discussions about topics that are of interest to them.

In summary, social networking services are online platforms that allow people to connect with each other and share information, ideas, and content. Some of the most important social networking services that are freely available and their founding dates include Facebook (2004), Twitter (2006), Instagram (2010), LinkedIn (2002), and Reddit (2005). These platforms

have facilitated human life by making it easier for people to connect with each other, share and discover new information and ideas, and participate in online communities.

5. Hepatitis is a viral disease and caused many deaths in Pakistan. How this virus is

spread and how such a patient should be treated?

Hepatitis is a viral infection that causes inflammation of the liver. There are several types of hepatitis viruses, including hepatitis A, B, C, D, and E. Hepatitis A and E are primarily transmitted through contaminated food and water, while hepatitis B, C, and D are transmitted through blood and bodily fluids.

Hepatitis B and C are the most common types of hepatitis in Pakistan and can be spread through:

- Sharing needles or other injection drug equipment
- Having unprotected sex with an infected partner
- Receiving a contaminated blood transfusion
- Being born to a mother who has hepatitis B or C
- Using contaminated personal hygiene items, such as razors or toothbrushes

Symptoms of hepatitis can range from mild to severe and may include fever, fatigue, loss of appetite, nausea, vomiting, abdominal pain, dark urine, and jaundice (yellowing of the skin and whites of the eyes).

Treatment for hepatitis depends on the type and severity of the infection. Some types of hepatitis, such as hepatitis A and E, can resolve on their own, while others, such as hepatitis B and C, may require antiviral medications to manage the infection. In severe cases, a liver transplant may be necessary.

To prevent the spread of hepatitis, it is important to practice good hygiene, including washing hands frequently and properly cooking and storing food, and to use safe injection practices and safe sex practices. Vaccines are also available for hepatitis A and B.

In summary, Hepatitis is a viral infection that causes inflammation of the liver and can be transmitted through contaminated food and water, as well as through blood and bodily fluids. Symptoms of hepatitis can range from mild to severe and may include fever, fatigue, loss of appetite, nausea, vomiting, abdominal pain, dark urine, and jaundice. Treatment for hepatitis depends on the type and severity of the infection and may include antiviral medications or, in severe cases, a liver transplant. To prevent the spread of hepatitis, it is important to practice

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good hygiene, use safe injection and sex practices, and get vaccinated for hepatitis A and B.

6. What are the different sources of renewable energy sources?

Renewable energy sources are forms of energy that can be replenished or regenerated over a relatively short period of time, compared to nonrenewable energy sources, such as fossil fuels. Some of the most common sources of renewable energy include:

1. **Solar energy:** Solar energy is generated from the sun's rays, and it can be harnessed using photovoltaic panels or concentrated solar power systems.
2. **Wind energy:** Wind energy is generated by the movement of air, and it can be harnessed using wind turbines.
3. **Hydroelectric energy:** Hydroelectric energy is generated by the movement of water, and it can be harnessed using dams or run-of-the-river hydroelectric systems.
4. **Geothermal energy:** Geothermal energy is generated by heat from the Earth's core, and it can be harnessed using geothermal power plants.
5. **Biomass energy:** Biomass energy is generated from organic materials, such as wood, agricultural waste, and landfill gas, and it can be harnessed through the use of biofuels or biogas.
6. **Ocean energy:** Ocean energy is generated from the movement of tides, waves, and temperature differences in the oceans, and it can be harnessed using tidal turbines, wave energy converters, and ocean thermal energy conversion systems.

In summary, renewable energy sources are forms of energy that can be replenished or regenerated over a relatively short period of time, compared to nonrenewable energy sources. Some of the most common sources of renewable energy include solar energy, wind energy, hydroelectric energy, geothermal energy, biomass energy, and ocean energy.

7. Cell is the basic unit of living organism. Discuss the structure of an animal cell.

The cell is the basic unit of life in all living organisms, and it is the smallest unit that can perform all the functions necessary for life. Animal cells are one type of cell that is found in animals, and they have a number of characteristic features that help them to carry out their functions.

- One of the key features of animal cells is the **cell membrane**, which is a thin, flexible barrier that surrounds the cell and separates the inside of the cell from the external environment. The cell membrane is made up of lipids and proteins, and it helps to protect the cell and maintain its shape.

- Inside the cell, the cytoplasm is a gel-like substance that contains all of the cell's organelles and other structures. The cytoplasm is where many of the cell's chemical reactions take place.
- One of the important **organelles** found in animal cells is the nucleus, which is the cell's control center. The nucleus contains the cell's DNA, which carries the genetic information that is passed down from one generation to the next.
- Other **organelles** found in animal cells include the endoplasmic reticulum and the Golgi apparatus, which help to transport and modify proteins and other substances within the cell; the mitochondria, which produce energy for the cell; and the lysosomes, which contain enzymes that help to break down waste and other materials.
- Animal cells may also contain other structures, such as cilia, flagella, and microvilli, which help the cell to move or absorb nutrients.

In summary, animal cells are the basic unit of life in animals, and they have a number of characteristic features that help them to carry out their functions. These features include the cell membrane, cytoplasm, nucleus, and various organelles, such as the endoplasmic reticulum, Golgi apparatus, mitochondria, and lysosomes. Animal cells may also contain other structures, such as cilia, flagella, and microvilli, which help the cell to move or absorb nutrients.

Discuss the structure of an animal cell in the simplest words

An animal cell is the basic unit of life in animals, and it is made up of several key parts that work together to keep the cell healthy and functioning properly.

The cell membrane is a thin layer that surrounds the cell and helps to protect it. The cytoplasm is a gel-like substance inside the cell that contains all of the cell's organelles. The nucleus is the control center of the cell, and it contains the cell's DNA.

Other important parts of the animal cell include the endoplasmic reticulum, which helps to transport and modify proteins and other substances; the Golgi apparatus, which helps to package and transport materials; the mitochondria, which produce energy for the cell; and the lysosomes, which contain enzymes that help to break down waste and other materials.

Animal cells may also contain cilia, flagella, and microvilli, which help the cell to move or absorb nutrients.

In summary, an animal cell is made up of several key parts, including the cell membrane, cytoplasm, nucleus, and various organelles such as the endoplasmic reticulum, Golgi

apparatus, mitochondria, and lysosomes. These parts work together to keep the cell healthy and functioning properly.

Differences b/w animal and plant cell

Animal cells and plant cells are both types of eukaryotic cells, which are cells that have a defined nucleus and organelles surrounded by a membrane. However, there are several key differences between animal cells and plant cells:

1. Cell wall: Plant cells have a cell wall that is made of cellulose and surrounds the cell membrane. The cell wall provides additional support and protection for the cell. Animal cells do not have a cell wall.
2. Chloroplasts: Plant cells have chloroplasts, which are organelles that contain chlorophyll and are used for photosynthesis. Animal cells do not have chloroplasts.
3. Central vacuole: Plant cells have a large central vacuole, which is a sac-like structure that stores water and other materials. Animal cells do not have a central vacuole, but they may have small vacuoles for storage.
4. Size and shape: Plant cells are typically larger and more rectangular in shape, while animal cells are smaller and more rounded.

In summary, animal cells and plant cells are both types of eukaryotic cells, but they have several key differences, including the presence of a cell wall, chloroplasts, and a central vacuole in plant cells, and the absence of these structures in animal cells. Plant cells are also typically larger and more rectangular in shape, while animal cells are smaller and more rounded.

Here are 10 differences between animal cells and plant cells in a table format:

Animal cells	Plant cells
Do not have a cell wall	Have a cell wall made of cellulose
Do not have chloroplasts	Have chloroplasts for photosynthesis

Animal cells	Plant cells
Do not have a central vacuole	Have a large central vacuole for storing water and other materials
Typically smaller and more rounded in shape	Typically larger and more rectangular in shape
Do not have a cell plate	Have a cell plate during cell division
Do not have a cell plate	Have a cell plate during cell division
Do not have plasmodesmata	Have plasmodesmata for communication between cells
Do not have stomata	Have stomata for gas exchange
Do not have a cuticle	Have a cuticle to protect the plant's surface
Do not produce their own food	Produce their own food through photosynthesis

In summary, animal cells and plant cells have several key differences, including the presence of a cell wall, chloroplasts, a central vacuole, a cell plate, plasmodesmata, stomata, and a cuticle in plant cells, and the absence of these structures in animal cells. Plant cells are also typically larger and more rectangular in shape, while animal cells are smaller and more rounded. Additionally, plant cells are able to produce their own food through photosynthesis, while animal cells must obtain their nutrients from other sources.

2021

1. Discuss the causes of the air pollution?

Air pollution is the presence of harmful substances in the air that can cause harm to human health and the environment. There are several causes of air pollution, including:

1. Emissions from vehicles: The burning of fossil fuels, such as gasoline and diesel, in vehicles releases a variety of pollutants into the air, including carbon dioxide, carbon monoxide, nitrogen oxides, and particulate matter.
2. Industrial emissions: Many industries, such as power plants, factories, and refineries, release pollutants into the air as a result of their manufacturing processes. These pollutants may include sulfur dioxide, nitrogen oxides, and particulate matter.
3. Agricultural activities: Agricultural activities, such as animal farming and the use of pesticides and fertilizers, can also contribute to air pollution.
4. Waste incineration: Incinerating waste, such as household garbage and medical waste, can release pollutants into the air, including particulate matter and dioxins.
5. Natural sources: Natural sources, such as wildfires and volcanic eruptions, can also

contribute to air pollution.

In summary, there are several causes of air pollution, including emissions from vehicles, industrial emissions, agricultural activities, waste incineration, and natural sources. These pollutants can harm human health and the environment.

2. What is climate change and what are the consequences of the climate change?

Climate change is the long-term alteration in the Earth's climate, including changes in temperature, precipitation, and other weather patterns. Climate change is primarily driven by the increasing levels of greenhouse gases in the atmosphere, which trap heat and cause the Earth's surface temperature to rise.

The main causes of climate change are human activities, such as the burning of fossil fuels, deforestation, and the use of certain industrial processes. These activities release greenhouse gases into the atmosphere, which contribute to the warming of the Earth's surface.

The consequences of climate change are wide-ranging and can include:

1. Rising sea levels: As the Earth's temperature increases, the polar ice caps and glaciers melt, causing sea levels to rise. This can lead to flooding and coastal erosion.
2. Extreme weather events: Climate change can lead to more frequent and severe heatwaves, droughts, storms, and other extreme weather events.
3. Damage to ecosystems: Climate change can cause the loss of biodiversity and damage to ecosystems, as plants and animals struggle to adapt to changing conditions.
4. Health impacts: Climate change can have negative impacts on human health, including respiratory problems, heat stroke, and the spread of diseases.
5. Agricultural impacts: Climate change can affect agriculture by altering growing seasons and crop yields.

In summary, climate change is the long-term alteration in the Earth's climate, and it is primarily driven by the increasing levels of greenhouse gases in the atmosphere. The consequences of climate change can include rising sea levels, extreme weather events, damage to ecosystems, health impacts, and agricultural impacts.

Climate change refers to the long-term change in the Earth's climate, particularly the increase in average global temperatures that has occurred over the past century. This change is largely due to human activities, such as the burning of fossil fuels, deforestation, and agricultural practices, which have released large amounts of greenhouse gases, such as carbon dioxide,

into the atmosphere. These gases trap heat from the sun, causing the Earth's temperature to rise.

The consequences of climate change are widespread and varied, and they can affect both human societies and natural ecosystems. Some of the potential consequences of climate change include:

1. Rising sea levels: As the Earth's temperature rises, the polar ice caps and glaciers are melting, leading to a rise in sea levels. This can cause flooding and erosion in coastal areas and small island nations.
2. Extreme weather events: Climate change can lead to more frequent and severe extreme weather events, such as heatwaves, droughts, hurricanes, and floods. These events can cause damage to infrastructure, disrupt food production, and affect human health.
3. Loss of biodiversity: As the Earth's climate changes, many species may be unable to adapt to the new conditions, leading to a loss of biodiversity. This could have cascading effects on ecosystems and the services they provide.
4. Agricultural impacts: Climate change can affect the growing conditions for crops, leading to declines in productivity and food security.
5. Human health impacts: Climate change can affect human health through a variety of mechanisms, including the spread of diseases, heat-related illnesses, and air pollution.

In summary, climate change is the long-term change in the Earth's climate, largely due to human activities, which have released large amounts of greenhouse gases into the atmosphere. The consequences of climate change are widespread and varied, and they can affect both human societies and natural ecosystems. Some of the potential consequences include rising sea levels, extreme weather events, loss of biodiversity, agricultural impacts, and human health impacts.

3. Describe the respiratory system in a human body?

The respiratory system is a body system that is responsible for breathing and the exchange of gases, such as oxygen and carbon dioxide, between the body and the environment. It is made up of several organs and structures, including:

1. The nose: The nose is the organ responsible for the sense of smell and for filtering and humidifying the air that we breathe.
2. The pharynx: The pharynx, or throat, is a muscular tube that connects the nose and mouth to the larynx (voice box) and the esophagus (food pipe).
3. The larynx: The larynx is a small, muscular organ located at the top of the trachea

(windpipe). It contains the vocal cords, which produce sound when air passes over them.
4. The trachea: The trachea is a tube that extends from the larynx to the bronchi (airways). It is lined with cilia (tiny hairs) that help to filter out dust and other particles from the air we breathe.
5. The bronchi: The bronchi are two tubes that branch off from the trachea and lead to the lungs. They are lined with cilia and mucus, which help to keep the airways clear of debris.
6. The lungs: The lungs are a pair of spongy, elastic organs located in the chest. They are responsible for exchanging gases between the body and the environment. The left lung is slightly smaller than the right lung to allow space for the heart.
7. The alveoli: The alveoli are tiny, grape-like structures located at the end of the bronchi in the lungs. They are lined with thin walls and are where the exchange of gases occurs. Oxygen from the air we breathe diffuses into the bloodstream through the alveoli, while carbon dioxide from the bloodstream diffuses into the alveoli to be exhaled.

In summary, the respiratory system is a body system that is responsible for breathing and the exchange of gases between the body and the environment. It is made up of the nose, pharynx, larynx, trachea, bronchi, lungs, and alveoli. The respiratory system works to provide the body with oxygen and remove carbon dioxide from the body.

Describe the Excretory system in a human body?

The excretory system is a body system that is responsible for removing waste products and excess substances from the body. It is made up of several organs and structures, including:

1. The kidneys: The kidneys are a pair of bean-shaped organs located in the lower back. They filter the blood to remove waste products and excess substances, such as urea and creatinine. The kidneys also help to regulate the balance of electrolytes, such as sodium and potassium, in the body.
2. The ureters: The ureters are tubes that carry urine from the kidneys to the bladder.
3. The bladder: The bladder is a muscular sac located in the lower abdomen. It stores urine until it is ready to be expelled from the body.
4. The urethra: The urethra is a tube that carries urine from the bladder out of the body.
5. The liver: The liver is a large organ located in the upper right abdomen. It plays a vital role in the excretory system by producing bile, which helps to digest fats and absorb fat-soluble vitamins. The liver also filters the blood to remove toxins and other substances that may be harmful to the body.
6. The skin: The skin is the largest organ in the body and plays a role in excretion by releasing sweat, which helps to regulate body temperature and remove excess water and

electrolytes from the body.

In summary, the excretory system is a body system that is responsible for removing waste products and excess substances from the body. It is made up of the kidneys, ureters, bladder, urethra, liver, and skin. The excretory system helps to maintain the balance of substances in the body and keep it functioning properly.

4. What do you know about the working system of computer?

A computer is a device that processes and stores data and is capable of performing a wide range of tasks based on a set of instructions, known as a program. The main components of a computer system include:

1. The central processing unit (CPU): The CPU is the “brain” of the computer, responsible for executing instructions and carrying out the various tasks that the computer is programmed to perform. It is made up of two main parts: the control unit, which fetches and decodes instructions, and the arithmetic logic unit (ALU), which performs arithmetic and logical operations on data.
2. Memory: Memory refers to the storage areas within a computer that are used to store data and instructions. There are two main types of memory: primary memory (also known as RAM) and secondary memory (also known as storage). Primary memory is volatile, meaning it is wiped clean when the computer is turned off, while secondary memory is non-volatile and is used to store data and instructions permanently.
3. Input/output devices: Input devices allow a user to input data and instructions into the computer, while output devices allow the computer to display the results of its processing. Examples of input devices include the keyboard, mouse, and touchpad, while examples of output devices include the monitor and printer.
4. The motherboard: The motherboard is the main circuit board in a computer and is responsible for connecting all of the other components together. It contains the CPU, RAM, and other components, as well as connectors for input/output devices and peripherals.
5. Peripherals: Peripherals are devices that are connected to the computer and are used to perform additional tasks or enhance its capabilities. Examples of peripherals include printers, scanners, and speakers.

In summary, a computer is a device that processes and stores data and is capable of performing a wide range of tasks based on a set of instructions. It consists of a central processing unit, memory, input/output devices, a motherboard, and peripherals. The various components of a computer work together to execute instructions and perform tasks.

5. How antibiotics works?

Antibiotics are medications that are used to treat infections caused by bacteria. They work by inhibiting the growth or killing bacteria, thereby allowing the body's immune system to clear the infection. There are several ways that antibiotics can do this, including:

1. Interfering with the synthesis of the bacterial cell wall: Some antibiotics, such as penicillins and cephalosporins, work by inhibiting the synthesis of the bacterial cell wall. The cell wall is a protective layer that surrounds the cell and helps to keep it intact. When the synthesis of the cell wall is inhibited, the cell becomes weak and may eventually burst, killing the bacteria.
2. Inhibiting the synthesis of proteins: Other antibiotics, such as tetracyclines and aminoglycosides, work by inhibiting the synthesis of proteins in bacteria. Proteins are essential for the growth and function of bacteria, so inhibiting their synthesis can kill the bacteria or prevent them from growing and multiplying.
3. Interfering with DNA replication: Some antibiotics, such as quinolones and rifampin, work by inhibiting the replication of bacterial DNA. DNA is the genetic material that carries the instructions for making proteins and other molecules. When DNA replication is disrupted, the bacteria are unable to divide and replicate, which can lead to their death.
4. Disrupting the cell membrane: Some antibiotics, such as polymyxins, work by disrupting the cell membrane of bacteria. The cell membrane is a thin layer that surrounds the cell and helps to protect it from the outside environment. When the cell membrane is disrupted, the bacteria become vulnerable to the surrounding environment and may die.

In summary, antibiotics are medications that are used to treat infections caused by bacteria. They work by inhibiting the growth or killing bacteria in a variety of ways, including interfering with the synthesis of the cell wall, inhibiting the synthesis of proteins, interfering with DNA replication, and disrupting the cell membrane.

How antibiotics works in simple words?

Antibiotics are medications that are used to treat infections caused by bacteria. They work by either killing the bacteria or preventing them from growing and reproducing. This allows the body's immune system to clear the infection. Antibiotics work in different ways, depending on the specific type of antibiotic and the type of bacteria it is targeting. Some antibiotics work by attacking the structure of the bacteria, while others work by disrupting the processes the bacteria need to survive and reproduce. In general, antibiotics are most effective when they are taken as prescribed and the entire course of treatment is completed.

6. What do you know about vertebrates and invertebrates?

Vertebrates and invertebrates are two main classes of animals based on their body structure and the presence or absence of a backbone.

Vertebrates are animals that have a backbone, or vertebral column, made up of bones or cartilage. Vertebrates are further divided into five main subgroups:

1. Fish: Fish are aquatic vertebrates that are adapted for life in water. They have gills, fins, and a streamlined body shape to help them swim efficiently.
2. Amphibians: Amphibians are vertebrates that are adapted for both aquatic and terrestrial environments. They have moist, permeable skin and are often able to absorb oxygen through their skin as well as through their lungs. Examples of amphibians include frogs, salamanders, and caecilians.
3. Reptiles: Reptiles are vertebrates that are adapted for life on land. They have dry, scaly skin and are often ectothermic, meaning their body temperature is regulated by the environment. Examples of reptiles include snakes, lizards, and turtles.
4. Birds: Birds are vertebrates that are adapted for flight. They have feathers, beaks, and wings, and are often able to maintain a high body temperature through the process of thermoregulation.
5. Mammals: Mammals are vertebrates that are characterized by the presence of mammary glands and the ability to produce milk to nourish their young. They are also often able to maintain a high body temperature through thermoregulation. Examples of mammals include humans, primates, and carnivores.

Invertebrates, on the other hand, are animals that do not have a backbone. Invertebrates are a diverse group of animals that include everything from insects and arachnids to mollusks and echinoderms. Invertebrates make up the majority of known animal species and can be found in a wide variety of habitats, from the oceans to the land.

In summary, vertebrates are animals that have a backbone, while invertebrates are animals that do not have a backbone. Vertebrates are further divided into five main subgroups: fish, amphibians, reptiles, birds, and mammals. Invertebrates are a diverse group of animals that include everything from insects and arachnids to mollusks and echinoderms.

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7. Discuss the composition, function and sources of protein?

Proteins are large, complex molecules that are essential for the structure, function,

and regulation of the body's tissues and organs. They are made up of smaller molecules called amino acids, which are joined together in long chains. There are 20 different amino acids that can be used to make proteins, and the specific sequence of amino acids determines the protein's structure and function.

Proteins have a wide range of functions in the body, including:

1. Structural: Proteins are an important component of the body's tissues and organs, and are often used to provide structural support. Examples of structural proteins include collagen, which is found in connective tissue, and keratin, which is found in hair and nails.
2. Enzymatic: Proteins called enzymes are responsible for catalyzing chemical reactions in the body. They help to speed up or facilitate the chemical reactions that are necessary for life.
3. Transport: Proteins called carrier proteins are responsible for transporting substances across cell membranes. They bind to specific molecules and help to move them into or out of cells.
4. Hormonal: Proteins called hormones are responsible for regulating various functions in the body. They are produced by glands and are released into the bloodstream, where they bind to receptors on target cells and trigger specific responses.
5. Immunological: Proteins called antibodies are produced by the immune system to help protect the body against infection and disease. They are able to recognize and bind to specific foreign substances (such as bacteria and viruses) and help to neutralize them.

Proteins can be obtained from a variety of sources, including both animal and plant sources. Animal sources of protein include meat, poultry, fish, eggs, and dairy products. Plant sources of protein include beans, nuts, seeds, and grains. It is generally recommended that people consume a variety of protein sources to ensure that they are getting all of the essential amino acids that they need.

In summary, proteins are complex molecules that are essential for the structure, function, and regulation of the body's tissues and organs. They are made up of smaller molecules called amino acids and have a wide range of functions, including structural, enzymatic, transport, hormonal, and immunological. Proteins can be obtained from both animal and plant sources.

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Differentiates between DNA and RNA.

DNA (deoxyribonucleic acid) and RNA (ribonucleic acid) are two types of nucleic acids that play important roles in the storage and expression of genetic information. While they have some similarities, there are also several key differences between DNA and RNA:

1. Structure: DNA is a double-stranded molecule that consists of two strands of nucleotides wound around each other to form a helix. Each strand is composed of a sugar molecule called deoxyribose, a phosphate group, and one of four nitrogenous bases (adenine, guanine, cytosine, or thymine). RNA is a single-stranded molecule that consists of a chain of nucleotides. Like DNA, it has a sugar molecule (ribose) and a phosphate group, but it has a different set of nitrogenous bases (adenine, guanine, cytosine, and uracil).
2. Function: DNA is the genetic material that stores the instructions for the synthesis of proteins and other molecules that are essential for the function and development of an organism. It is found in the nucleus of cells and is passed down from parent to offspring during reproduction. RNA is involved in the expression of genetic information. It carries the instructions for the synthesis of proteins from DNA to the ribosomes, where proteins are synthesized.
3. Replication: DNA replication is the process by which DNA is copied during cell division. It occurs in a semi-conservative manner, meaning that each of the two strands of the double helix serves as a template for the synthesis of a new complementary strand. RNA synthesis, on the other hand, occurs through a process called transcription, in which the genetic information in DNA is copied into RNA.

In summary, DNA and RNA are two types of nucleic acids that are involved in the storage and expression of genetic information. DNA is a double-stranded molecule that stores genetic information and is found in the nucleus of cells, while RNA is a single-stranded molecule that carries genetic information from DNA to the ribosomes, where proteins are synthesized. DNA replication occurs during cell division, while RNA synthesis occurs through transcription.

Here are some key differences between DNA and RNA in a table format:

DNA	RNA
Double-stranded molecule	Single-stranded molecule
Consists of two strands of nucleotides wound around each other	Consists of a chain of nucleotides
Sugar molecule is deoxyribose	Sugar molecule is ribose
Nitrogenous bases include adenine, guanine, cytosine, and thymine	Nitrogenous bases include adenine, guanine, cytosine, and uracil
Stores genetic information	Carries genetic information from DNA to the ribosomes, where proteins are synthesized
Found in the nucleus of cells	Found in the nucleus and cytoplasm of cells
Replication occurs during cell division	Synthesis occurs through transcription

In summary, DNA and RNA are two types of nucleic acids that are involved in the storage and expression of genetic information. DNA is a double-stranded molecule that stores genetic information and is found in the nucleus of cells, while RNA is a single-stranded molecule that carries genetic information from DNA to the ribosomes, where proteins are synthesized. DNA replication occurs during cell division, while RNA synthesis occurs through transcription.

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