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GISA-TEST-2

BATCH-01/ONLINE.

Q1(a)

Ans.

Cell

- The word cell derived from Latin word cellula which means small rooms
- Cells are the basic building blocks of all living organism. Consider as basic unit of life.
- Human body consists of trillions of cells.
- It consists of various organelles that work together to maintain life

Cytoplasm

Structure, Cytoplasm is a jelly like semi fluid substance found between the nucleus

and cell membrane.

- It contains water, salts and organic molecules
- It also called as house of organelles like Endoplasmic reticulum, Golgi apparatus, Mitochondria etc

Function

- It provides support & shape to the cell.
- It act as a medium for chemical reactions.
- Also store nutrients and waste products
- It act. as a mean of transport of genetic materials
- It facilitate movement of materials within the cells.

ii) Plastids

Structure → only present in plants

- plastids are double membrane bounded organelles that contains pigments of different colours
- There are 3 types of plastids.
 - a) Chloroplast
 - b) Chromoplast
 - c) Leucoplast

a) Chloroplast

- These are Plastids that present in green parts of the plants.
- It contains chlorophyll

b) Chromoplast

- These are the coloured parts pigments that provide colours to plants other than green.

c) Leucoplast

- These are the colourless pigment and present in underground parts of plants.

Function:

- Chlorophyll found in chloroplast take part crucial role in photosynthesis.
- Chromoplast that give colour to fruits & flowers helps to attract insects for pollination.
- Leucoplast store essential nutrients including starch, oils or protein.

iii) Nucleus Structure

- It is - a spherical organelle, surrounded

by Nuclear membrane
→ It contains nucleoplasm, chromatin (DNA) and a nucleolus. & discovered by Robert Brown.

Function:

- It controls all the cellular activities including growth, metabolism and reproduction
- It stores genetic information (DNA), responsible for inheritance
- Also regulates protein synthesis through RNA.

Q1(b)

Ans

Structure of Nephron.

- A Nephron is the structural and functional unit of kidney, responsible for blood filtration and urine formation.
- Each kidney contains approximately 1 to 1.5 million Nephron
- The structure of Nephron mainly consist of Bowman's capsule & Glomerulus, PCT, loop of Henle, DCT, collecting duct etc

• Bowman's Capsule & Glomerulus

- Bowman's capsule is a cup shaped structure that surrounds the glomerulus
- A glomerulus is a network of blood capillaries
- It performs ultrafiltration.

• Proximal Convoluted Tubule

- PCT located after the Bowman's capsule, it has microvilli to increase absorption.
- It reabsorbs glucose, amino acids, vitamins and salt into blood & maintain pH

• Loop of Henle

- It consists of a descending limb (permeable to water) and ascending limb (impermeable to water)
- It concentrates urine by absorbing water & salt

• Distal Convoluted Tubule

- It regulates ion balance (Na^+ , K^+), pH, BP by responding to hormones like aldosterone.
- It is a short nephron segment b/w loop of Henle and collecting duct

Collecting Duct

→ The last part of a long twisting tube that collects urine from Nephrons and perform final reabsorption under the influence of ADH hormone.

Functions of Nephron

• Filtration

It removes waste, toxins and excess substance from blood.

• Reabsorption

It reabsorbs essential nutrients, water and ions back into the bloodstream.

• Secretion

It actively removes additional waste and ions into the tubule and do secretion.

• Urine formation

It concentrates waste into urine also maintain water and electrolytes balance.

• Homeostasis

It also regulates blood pressure, pH, blood volume to maintain homeostasis.

Q1(c)

Ans

Causes of Smog

Industrial pollution:

The main cause of smog is industrial pollution because factories emit sulphur dioxide and other chemical matter during production processes.

Vehicle emission

→ The next cause of smog is the heavy traffic in cities like Lahore, Karachi produces a large amount of Nitrogen Oxide and also Volatile organic Compound. These emissions contribute to smog.

Burning Fossil Fuels:

→ When fossil fuels are burned, they release a large amount of CO_2 , NO_2 and other GHGs.

→ Power plants burning coal in India and China create dense smog due to excessive emission.

Agricultural Activities

→ Agricultural activities like burning of crop also contribute to smog.

→ Like each winter, an estimation is that 3.6 - 5 of 8.5 million tons of rice residue is burnt to plant wheat in Punjab which ~~is~~ is the main cause of smog largely in Punjab.

Natural Causes

Natural causes of smog include volcanic eruption emit SO_2 , Forest fires (California wildfire release smoke) and dust storms.

Preventions.

→ Reduce Vehicle emission:

- Encourage people to use public transportation, carpooling and electric vehicles to lower emissions.
- Promote cycling and walking for short distances, which not only reduce pollution but also improve health.
- Like London have implemented electric buses and bike-sharing system to reduce emission, we should also take this type of actions.

→ Promote Clean energy

- The next step to prevent from smog is that replace fossil fuels with renewable energy resources such as solar, wind, hydropower to minimize emission.
- Like Germany has shifted to renewable energy, reducing reliance on coal based power plants.

→ Control of industrial pollution.

- Government has to enforce strict regulation to monitor industrial emission.

→ Also industries should install filters or scrubbers to remove pollutants before releasing in air

→ Develop industrial zones far from the residential areas to minimize exposure of harmful gases.

Avoid Crop burning

→ Introduce modern agriculture techniques like mulching and composting to manage crop residues without burning.

→ Provide awareness programs and financial assistance to farmers for adopting eco-friendly practices.

→ Also by promoting the use of Biodegradable Waste management system to replace burning, we can control smog.

Increase Plantation

→ For this purpose, launch tree plantation drives in urban areas to absorb pollutant and improve air quality, as trees are essential part to reduce pollution and smog.

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Q1(d)

Ans.

Solid waste management

→ Solid waste management is the process of collecting, transporting, processing, recycling and disposing of solid materials into a safe and eco-friendly manner.

→ Its objectives to reduce negative impacts of waste on public health and on environment.

Weaknesses of SWM

Lack of Proper Planning

→ The main weakness of SWM of Pakistan is the absence of a national-level strategy and effective policies for waste management.

→ It is due to the poor coordination among government authorities.

Insufficient Infrastructure

→ The next weakness is inadequate waste collection vehicles, equipment and dumping sites, even most of the cities lack sanitary landfills and proper disposal system.

Poor recycling Practices.

→ The another weakness of SWM is recycling depends mainly on informal workers rather than organized system
→ These workers collect recyclable materials like plastics, metals, papers etc however they lack training

No waste Segregation

→ Another or main weakness of SWM in Pakistan is that waste is not separated at the source, mixing recyclable, organic and hazardous waste.

→ This makes recycling and treatment more difficult.

Low waste collection rate

→ In Pakistan only 50-60% of waste is collected in urban areas, while in rural areas no formal waste collection and management system exist.

Financial Problem

→ The government does not provide enough funding for modern waste management technologies due to this, most of the work relies on manual labor which is less efficient.

Weak Law enforcement

→ In Pakistan, the laws related to waste management such as Pakistan environmental protection act (PEPA) are not strictly followed, which lead to violation.

Lack of Awareness

→ Many people are unaware of proper waste disposal methods. So, there is need to educate people about recycling and reducing waste.

Q3(a)

Ans:

Human Eye Working

→ The human eye works like a camera allowing us to see by focusing light onto a sensitive layer called Retina. The detail of working of eye are as follows:-

Entrance of Light

- In human eye, light first enters through the cornea.
- Cornea is the transparent outer layer.
- The cornea bends and the incoming light help to focus them properly.

Control of Light

- After the light passing through the cornea, light enters into pupil.

→ pupil is the opening in the center of Iris.

→ Then Iris (coloured part of eye) control the size of pupil to adjust the amount of light entering the eye.

→ However in bright light, pupil become smaller to reduce light entry while

→ In dim light, pupil becomes larger to allow more light inside.

Focus (Lens)

→ After that light then passes through the lens, which focuses it further onto the retina.

→ For this, the ciliary muscles surrounding the lens change its shape to adjust focus for near and far objects.

Image formation

→ Retina is a light sensitive layer located at the back of eye

- It contains photoreceptor cells called rods and cones.
- Rods detect dim light and help in black and white vision.
- Cones detect bright light and allow us to see colours.
- Then retina converts light rays into electrical signal.

Signal Transmission

- After that the optic nerve carries these signals from retina to brain.
- The brain processes these signals to form a clear and upright image of the object we see.

X ————— X

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Q 3(d)

Ans.:-

GIS

→ It is abbreviated as Geographic Information System.

→ It can be defined as a system used to collect, store, analyze and display geographic data.

→ It helps in mapping, analyzing trends and managing spatial data.

→ Its components include hardware, software, maps and users for managing data.

GPS

Its abbreviation is Global Positioning System.

It can be defined as a satellite based system used to find out exact locations on earth.

It provides location, direction and navigation information.

Its components include satellites, receivers and signals for positioning.

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Its function is that it is used for creating maps and studying geographic pattern.

→ Examples of use:
Urban planning,
disaster management
and environmental
studies

Its function is that it is used for tracking positions, guiding routes and measuring distance.

Example of use:
Vehicle navigation,
and
military
operations

Q3(b)

Ans

Malaria

→ Malaria is the world's largest parasitic disease. It is caused by the plasmodium (parasite) through the bite of mosquito in human.

→ Every year 300-500 million people affect from this disease, 3 million people die, most of them are child under 5 years.

Symptoms

→ The symptoms of Malaria are below.

- High fever with chills and sweating is the first symptom.
- Headach and muscle pain also feel by the patient.
- Fatigue with weakness can also feel.
- In severe cases Anemia and Jaundice also see in patients.
- Nausia, Vomit and may be diarrhea.

Preventive Measures

Use of Nets

→ The main prevention is that to use mosquito nets and repellent to prevent from mosquito bites.

Use of Sleeved clothes

Another prevention is that use long-sleeved

clothes and also ^{use} covered shoes to prevent from mosquito biting on open areas of body.

Drain Stagnant water

→ It is the most important prevention to drain stagnant water where mosquitoes breed like ponds and puddles.

Use Spray

→ To prevent from Malaria, should spray insecticides and also use mosquito coil.

Take Medicines

→ At last, should take Anti-Malarial medicines when travelling to malarial affected region

Dengue

→ Dengue (The break bone fever) is a infectious viral disease. It is a mosquito ~~bore~~ ^{bite} disease caused by one

of four closely related virus known as DEN-1, DEN-2, DEN-3 and DEN-4 virus.

→ This disease is endemic in more than 100 countries throughout Africa, America, Asia...etc

Symptoms :-

→ The 1st main symptom of Dengue is suddenly high fever (upto 104°F) with severe headache and pain behind the eyes.

→ Next symptom is the pain in joint and muscle.

→ Skin become rash and red spot found on skin.

→ Nausea, vomiting and fatigue are also the symptoms.

→ In severe cases, bleeding from nose, gums or under the skin which may lead to dengue hemorrhagic fever.

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Prevention

Use of nets and repellent :-

→ Avoid from mosquito bites by using repellents, mosquito nets and screens on windows and doors.

Wear light coloured clothes

→ To prevent from mosquito, should wear light coloured clothes with long sleeves and pants.

Use insecticides

→ Next prevention is that use insecticides and keep surroundings clean and dry.

Eliminate standing water

→ Also eliminate standing water in pots, tires and containers to stop mosquito breeding.