

Q4:

(a)

Hepatitis:

Hepatitis is the inflammation of liver caused by virus. Its severity vary from mild level infection to serious liver damage.

Causes of Hepatitis:

Hepatitis is mostly caused by virus.

Other causes are excessive use of alcohol, certain medicines in high dose, and autoimmune disorder.

Types of Hepatitis:

(1) Hepatitis - A

Spread through contaminated food and water.

(2) Hepatitis - B

Transmitted through contact with infected person.

(3) Hepatitis - C

Caused by Hepatitis - C (HCV) virus.

(4) Hepatitis - D

It also caused by virus. Mostly caused in Hepatitis - B patients.

(5) Hepatitis - E

Transmitted through contaminated water.

Effects of Hepatitis:

1) Hepatitis causes liver failure and liver cancer.
Liver Cirrhosis - Liver become scars of functioning properly.

2) The liver's ability to function deteriorates leading to life threats.

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Symptoms of Hepatitis:

- 1) Feeling extreme tiredness.
- 2) Abdominal pain
- 3) Nausea and vomiting.
- 4) Loss of Appetite.
- 5) Stool may turned pale or clay colored.
- 6) Moderate fever.
- 7) Muscle or joint pain.

Prevention:

- i) Hepatitis A and B be prevented through vaccination.
- ii) Adapting safe hygienic practices.
- iii) Avoid sharing needles or any equipment used by Hepatitis patient.
- iv) Limit Alcohol Consumption.
- v) Ensure the blood, that is ~~trans~~ transmitting through transfusion is screened for Hepatitis.

(B)

Foods Preservation:

Food Preservation means extend food's life by slowing down spoilage caused by microorganisms, enzymes, or environmental factors.

Several traditional and scientific methods are being used for food preservation.

Methods for food Preservation:

Following are some of the methods for food preservation.

(i) Physical method:

(a) Refrigeration and freezing:

Microbial growth stops at low temperature and hence keep the food preserved.

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(b) Dehydration:

Removing moisture that is needed for microbial growth.

(c) Vacuum Packaging:

Remove air to reduce oxidation and microbial growth.

(d) Canning:

Seal the food in airtight containers and heat it to destroy microorganisms.

(2) Chemical Methods:

(a) Pickling: Use acid to create an environment unsuitable for microbial growth.

(b) Salt Preservation:

Draws out moisture and inhibits microbial growth.

(c) Sugar Preservation: Act as preservative by reducing water activity in food.

(3) Thermal Method:

(a) Sterilization:

Using high temperature to kill microorganisms.

(b) Blanching:

Briefly boiled food to inactivate enzymes before freezing or drying.

(4) Irradiations:

Using ionizing radiations to kill microorganisms, Pests and Parasites in the food without heating.

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© Part - c

Fertilizers:

Fertilizers are usually the substances provided to the soil to provide the essential nutrients for their growth.

Types of fertilizers:

Based on their composition, fertilizers has two types.

① Organic fertilizers:

Organic fertilizers are mostly obtained from natural sources such as plants and animal waste.

Example:

Manure, Compost, Bone meal are organic fertilizers.

② Inorganic fertilizers:

These are chemical manufacturing fertilizers.

Examples:

Urea, Ammonium Nitrate, Potash are inorganic fertilizers.

Other types of Fertilizers:

① Single nutrient fertilizers (Straight fertilizers):

Such fertilizers contain only one major nutrient.

Example:

Nitrogen fertilizer, Phosphorus fertilizer, Potassium fertilizers.

② Multi-nutrient fertilizers (Compound fertilizers)

Such fertilizers contain more than one major nutrient.

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Example:

NPK fertilizers: Contain Nitrogen, Phosphorus and Potassium.

DAP (Diammonium Phosphate): Supplies both Nitrogen and Phosphorus.

(3) Solid fertilizers:
Powder form, directly mixed with soil.

(4) Liquid fertilizers:
Dissolved in water and applied through spraying.

(5) Foliar fertilizers:
Apply directly to plant leaves.

Part - (d)

Structure of teeth:

Each tooth has two main parts.

(a) Crown:

The visible part of the tooth above the gum.

(b) Root:

Part of the tooth embedded in the jaw bone.

Layers of tooth:

(a) Enamel:

The outermost layer. It protect

decay.

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(b)

(ii) Dentin:

Softer and yellowish, lying beneath enamel. Contains tiny tubes that transmit sensation.

(iii) Pulp:

The inner-most layer, contains blood vessels, nerves, and connective tissues. Supplies nutrients and sensory signals to tooth.

Types of teeth:

Human have four types of teeth.

(1) Incisors:

- These are 8 in number, 4 in upper and 4 in lower jaw.
- Flat and sharp
- Function is cutting food and slicing.

(2) Canines:

- Four in number. Two in each jaw.
- Shape is pointed and sharp
- Function is tearing and ripping food.

(3) Premolars:

- Lying behind the canines.
- They are 8 in number. Four in each jaw.
- Shape is broad and ridge.
- Function is crushing and grinding food.

(4) Molars:

- Back of the mouth. 12 in number, six on each side.
- Shape is large and flat.
- Function is chewing and grinding food.

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Q No 05: (a)

Prokaryotic cell:

- Prokaryotic cells are those which have no ^{true} nucleus.
- These are generally smaller in size i.e. 1-10 μ m.
- It has circular DNA without histones.
- Lack membrane bound organelles.
- Prokaryotic cells are reproduced by binary fission.
- Minimal or absent cytoskeleton.

Eukaryotic cells:

- They have well developed cytoskeleton.
- It has complex cell division. Mitosis and Meiosis is involved.
- Contain membrane bound organelles.
- It has true nuclei.
- Linear DNA, organised into chromosomes.
- Larger in size i.e. 10-100 μ m.

Part - B

Global Warming:

Global warming refers to the long term rise in Earth's average surface temperature due to increase of greenhouse gases in the atmosphere.

Major Contributors of Warming:

Greenhouse gases such as Carbon dioxide (major contributor), Methane, Nitrous oxide, and Chlorofluorocarbons (CFCs) are the major contributors in a green global warming.

Causes of Global Warming:

These are several natural and human factors behind global warming:

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Natural Causes:

Natural causes of global warming are less significant as compared to human impacts. Following are some natural factors behind global warming.

- ① Volcanic eruptions.
- ② Variation of solar radiations

Anthropogenic Causes:

Human activities are the major contributors behind global warming. These are more significant as compared to natural causes. Some of anthropogenic activities that cause global warming, are the following:

- ① Burning of fossil fuels for energy.
- ② Deforestation, resulting in reduction of carbon sinks.
- ③ Industrial process releasing green house gases.
- ④ Unplanned agriculture activities, particularly livestock farming.

Effects of Global Warming:

- Rising Temperature and increasing intensity of heatwave.
- Melting of Glaciers leading to rising sea levels.
- Extreme weather events, leads to hurricanes, droughts, and floods.
- Loss of Biodiversity.
- Release of Carbon dioxide can acidify oceans which can affect marine life.

Solutions to Mitigate Global Warming:

It is impossible to curb Global Warming at once. But by adopting some measures we can reduce Global warming.

- (i) Transition to renewable energy sources
- (ii) Increasing energy efficiency.
- (iii) Reforestation and afforestation.
- (iv) Adapting sustainable agriculture practices.
- (v) Reduce, Reuse, and Recycle waste.

Kyoto Protocol:

Kyoto Protocol is an international treaty adopted on December 11, 1997, in Kyoto Japan. And entered into force on February - 2005. It aimed to combat climate changes by reducing the emissions of greenhouse gases.

Mechanisms for Reducing Emission:

- Allow developed countries to invest in emission-reduction projects in developing countries.
- Permit investment in emission reduction projects in other countries.

Criticism of Kyoto Protocol:

- Limited enforcement mechanism.
- Withdrawal of USA weaken the agreement.
- Exclusion of major developing countries like India and China from binding targets.

Part - C:

Geographic Information System (GIS):

Geo Information System is a system that is used to collect and analyze spatial information. It enable users to interpret spatial data to uncover patterns and relationships.

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Components of GIS:

Hardware Components, Softwares, and spatial data in form of maps and satellite images.

Function of GIS:

The system gathers spatial data through various methods and organises the data efficiently. The system then analyze the data and then visualize it. After visualization, the system create maps based on the data to help users to make decision.

Applications of GIS:

GIS can be used for a variety of purposes such as:

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① Urban Planning: GIS is used infrastructure development, land planning, and environmental monitoring.

② Tracking of natural resource could be done with the help of GIS.

③ Transportation: GIS can be used for route planning and logistic optimization.

④ Agriculture Monitoring, soil analysis, and Precision farming.

⑤ GIS can be widely used in disaster management.

Challenges of GIS:

(i) Outdated data can lead to flawed analysis and decisions

(ii) Operating GIS is a complex job and need an expert to operate the system.

(iii) GIS system is costly and it is difficult for some organisations to implement.

Section II

Q 6:

Part - C :

Given data :

Diameter of a circle = 6cm

Required data :

Circumference of circle = ?

Area of circle = ?

Calculation :

As Diameter is = 6cm

Radius will be $r = \frac{D}{2} = \frac{6}{2}$

$r = 3\text{cm}$

Now Circumference of circle = $2\pi r$

$$C = 2(3.14)(3)$$

$$\therefore \pi = 3.14$$

$$C = 6 \times (3.14)$$

$$\boxed{C = 18.84 \text{ m}}$$

Now Area of Circle $A = \pi r^2$

$$A = (3.14)(3)^2$$

$$A = (3.14)(9)$$

$$\boxed{A = 28.26 \text{ m}^2}$$

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Part - D

Missing number -

(i) 13, 24, 46, 90, 178, _____

Missing number is "354"

The numbers are differentiating with multiples of 27.

(ii) 5, 6, 9, 14, 21, _____

Missing number is 30 -

The numbers are different by consecutive odd numbers

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Q7: Part D:

Calculation:

$$\text{Let the correct result is} = x \times \frac{5}{3}$$

$$\text{Incorrect is} = x \times \frac{3}{5}$$

Error in both results: $E = ?$

$$E = (x \times \frac{5}{3}) - (x \times \frac{3}{5})$$

$$= x \left(\frac{5}{3} - \frac{3}{5} \right)$$

$$= x \left(\frac{5 \times 5 - 3 \times 3}{15} \right)$$

$$= x \left(\frac{25 - 9}{15} \right)$$

$$= x \left(\frac{16}{15} \right)$$

Now to find % error:

$$\text{Percent error} = \left(\frac{\text{Error}}{\text{correct result}} \right) \times 100$$

$$= \left(\frac{x \times \frac{16}{15}}{x \times \frac{5}{3}} \right) \times 100 \%$$

$$= \left(\frac{\frac{16}{15}}{\frac{5}{3}} \right) \times 100 \%$$

$$= \left(\frac{16 \times 3}{15 \times 5} \right) \times 100 \%$$

$$= \left(\frac{48}{75} \right) \times 100 \%$$

$$= \left(\frac{16}{25} \right) \times 100 \%$$

$$= 64 \%$$

$$\boxed{\text{Percent error} = 64 \%}$$

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