

Section 1 (Science)

Q₄ (2M) What is hepatitis? Explain its causes, symptoms and prevention.

(A) Hepatitis :-

Hepatitis is an inflammation of the liver. It can be caused by viral infections, alcohol consumption, autoimmune diseases or exposure to toxic substances. There are five main types of hepatitis: A, B, C, D and E.

Causes of Hepatitis :-

Following are the causes of Hepatitis :-

1) Viral Infections :-

Hepatitis A and E are typically transmitted through ingestion of contaminated food or water. Hepatitis B, C and D are usually spread through contact with infected body fluids, such as blood, vaginal secretions and semen.

2) Alcohol and Drugs :-

Excessive alcohol consumption and certain drugs cause liver inflammation.

3) Autoimmune Disease :-

In some cases, the body's immune system attacks liver cells, leading to hepatitis.

4) Toxins :-

Exposure to toxic substances, including certain medications, can cause hepatitis.

Symptoms of Hepatitis

Acute Hepatitis :-

Acute Hepatitis have fatigue, nausea, vomiting, abdominal pain, loss of appetite, dark urine, and jaundice.

Chronic Symptoms :-
Chronic hepatitis can lead to liver cirrhosis, liver cancer, and liver failure.

Prevention of Hepatitis :-
Following are some of the preventive measures for hepatitis :-

1) **Vaccination :-**
Vaccines are available for hepatitis A and B. Hepatitis E vaccine is available in some regions.

2) **Hygiene Practice :-**
Practicing good hygiene, such as handwashing and safe food handling, can help prevent hepatitis A and E.

3) **Safe Practice :-**
Using safe injection practices, avoiding sharing needles, and practicing safe sex can help prevent hepatitis B, C, and D.

4) **Avoiding Alcohol and Drugs :-**
Limiting alcohol consumption and avoiding illicit drugs can reduce the risk of alcohol-related hepatitis.

Q4) Elaborate a few methods of food preservation.

Food preservation involves various techniques to prevent food from spoiling, ensuring it remains safe and edible for longer periods.

1. **Refrigeration :-**

Storing food at low temperatures (0 to 5°C) slows down the growth of bacteria, yeasts, and mold.

a) **Freezing :-**

At temperatures below -18°C , the growth of microorganisms is significantly inhibited.

3) Canning :-

This method involves placing food in sealed containers and heating them to destroy micro-organisms. The vacuum seal prevents new bacteria from entering.

4) Drying :-

Removing moisture from food inhibits the growth of bacteria, yeast and mold.

5) Salting :-

Adding salt to food draws out moisture and creates an inhospitable environment for micro-organisms.

4. Explain fertilizers. What are their types?

Fertilizers are substances added to soil or plants to supply essential nutrients, enhance growth, and improve crop yield.

Types of Fertilizers

Following are the types of fertilizers

- 1 Organic Fertilizers
- 2 Inorganic Fertilizers
- 3 Nitrogen Fertilizers
- 4 Phosphorus Fertilizers
- 5 Potassium Fertilizers
- 6 Compound fertilizers

40 What is the anatomy of a human tooth?

People have two sets of teeth in their lives, the primary teeth also called baby teeth and the permanent

teeth

Teeth Types :-

- 1 Incisors 8
- 2 Canines 4
- 3 Premolars 8
- 4 Molars 12

Anatomy of a human tooth

A human tooth consists of the following parts:

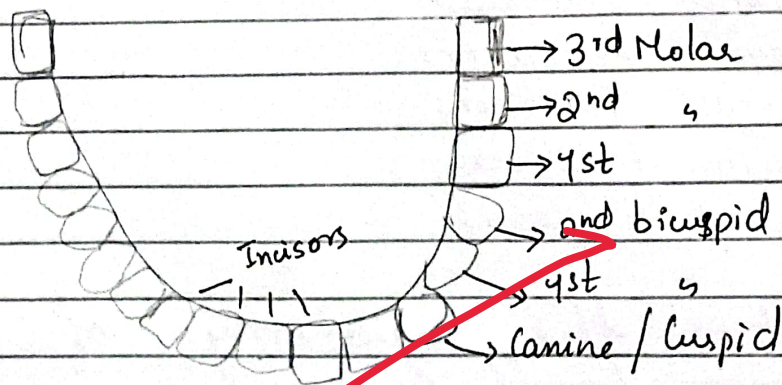
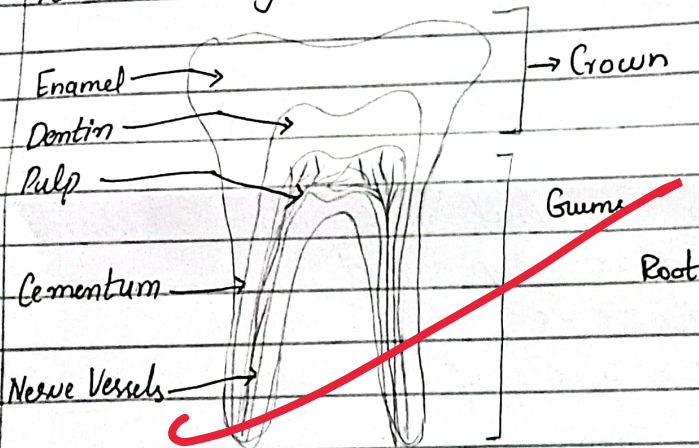
Enamel : The hard, outer layer

Dentin : The layer beneath the enamel

Pulp : The innermost part containing nerves and blood vessels

Cementum : A layer covering the root.

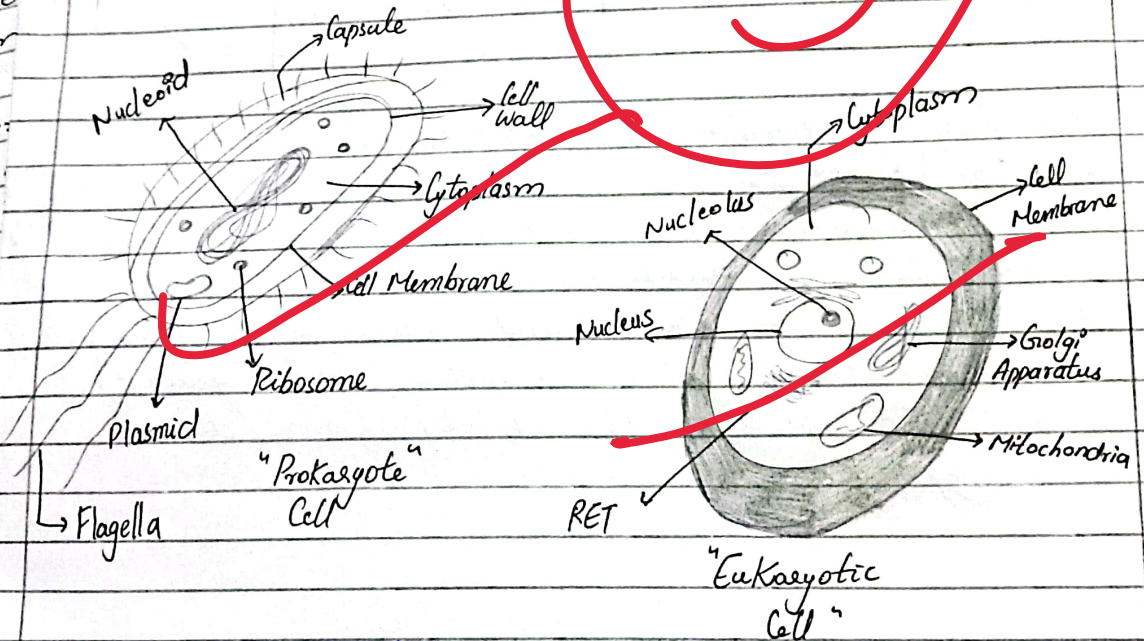
Periodontal Ligament : Connects the tooth to the bone



Structure of Tooth

Q) Differentiate between a eukaryotic and Prokaryotic cell.

Feature	Eukaryotic Cells	Prokaryotic Cells
Nucleus	Present	Absent
Cell Size	Larger (10-100 micrometers)	Smaller (1-5 micrometers)
Organelles	Membrane-bound organelles present	No membrane-bound organelles
DNA Structure	Linear DNA with histones	Circular DNA with histones
Cell Division	Mitosis and Meiosis	Binary fission
Ribosomes	Larger (80S)	Smaller
Examples	Animals, plants, fungi, protists	Bacteria, archaea



B) What is global warming? What is the Kyoto Protocol?

Global Warming :-

The gradual increase in Earth's average surface temperature due to the buildup of greenhouse gases in the

in the atmosphere.

Kyoto Protocol :-

An international treaty adopted in 1997 that commits its parties to reduce greenhouse gas emissions to combat global warming.

(k) Write a detailed note on GIS ?

GIS (Geographic Information System)

A system that captures, stores, analyzes, and presents spatial or geographic data. It helps in mapping, urban planning, environmental management, and resource management by visualizing data in a spatial context.

(l) Briefly describe antioxidant

Antioxidant :-

Molecules that inhibit oxidation and neutralize free radicals, preventing cell damage. They are found in various food, such as fruits, vegetables, nuts and grains, and help protect the body from diseases and aging.

Explain complex concepts in simple terms.

Use real-life examples.

Include diagrams and flowcharts for competitive edge.

Discuss practical applications of scientific concepts.

Show all steps and working for calculations.

Use diagrams and graphs

Section-II

Q If sum of the 3-digit is 15. Sum of 10th and unit digit is 12.
 (a) The difference of the unit digit from 10th digit is equal to 2.
 What is the three digit number.

Let hundred digit be = H

Let tens digit be = T

Let Units digit be = U

1. Sum of the digit is 15
 $H + T + U = 15 \rightarrow \textcircled{1}$

2. Sum of the tens and units digit is 12
 $T + U = 12 \rightarrow \textcircled{2}$

3. Difference between units digit and tens digit is 2
 $U - T = 2 \rightarrow \textcircled{3}$

Solving Equation :-

$$U - T = 2$$

$$U = T + 2$$

→ Substitute $U = T + 2$ into the equation $\textcircled{2}$ $T + U = 12$

$$T + (T + 2) = 12$$

$$2T + 2 = 12$$

$$2T = 10$$

$$\boxed{T = 5}$$

→ Now find U using $U = T + 2$

$$U = 5 + 2$$

$$\boxed{U = 7}$$

→ Using equation $H + T + U = 15$ to find H

$$H + 5 + 7 = 15$$

$$H + 12 = 15$$

$$\boxed{H = 3}$$

So the 3 digit number is 357

Qr (c) Diameter of a circle is 6cm. Find circumference and area of circle.

Formula

$$\text{Circumference} = \pi \times \text{Diameter}$$

$$\text{Area} = \pi \times \left(\frac{\text{Diameter}}{2}\right)^2$$

$$\text{Circumference} = \pi \times 6\text{cm} \approx 18.85\text{cm}$$

Area :

$$\text{Radius} = \frac{\text{Diameter}}{2} = \frac{6}{2} = 3\text{cm}$$

$$\text{Area} = \pi \times (3\text{cm})^2 \approx 28.27\text{cm}^2$$

So, the circumference is approximately 18.85cm, and the area is approximately 28.27cm²

(d) Identify the missing number

1. 13, 24, 46, 90, 178, 354

2. 5, 6, 9, 14, 21, 30