

Q#1

What is hepatitis? causes symptoms and prevention?

Answer:-

Hepatitis is the inflammation of the liver often caused by viral infections, but result from other factors such as alcohol use, toxins or certain medications. It plays a key role in metabolism, detoxification and digestion so inflammation can disrupt its normal functions.

Causes of hepatitis:

Hepatitis A (HAV) ^{≡ viral infections:-}

caused by consuming food or water contaminated with the virus. It is typically spread through poor sanitation and hygiene. It is also spread through food and water carrying the virus.

Hepatitis B (HBV)

It spread through contact with infected blood or bodily fluids, including sexual contact, sharing needles and from mother to child during child birth.

Hepatitis C (HCV)

It primarily spread through blood to blood contact, often sharing a needles, and unclean medical equipments. It has low risk of spreading through sexual contact. It is also caused by breast milk.

Hepatitis D (HDV)

It occurs in people infected with hepatitis B. It spread through contact with infected blood.

Hepatitis E (HEV)

It transmitted through consumption of contaminated water particularly in regions with poor sanitation.

2 Alcohol use:

Chronic heavy drinking can lead to alcoholic hepatitis.

3 Toxins

Exposure to certain chemicals or toxins such as industrial chemicals or medications.

4 Autoimmune diseases:

In autoimmune hepatitis, the body's immune system mistakenly attack liver cells, leading to inflammation.

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Non-Alcoholic fatty liver disease:-

Fat buildup in the liver without alcohol consumption, which can lead to inflammation and scarring over time.

Symptoms:-

The symptoms of hepatitis depends on the cause and severity of infection.

Common symptoms include:-

- ↳ Fatigue
- ↳ Jaundice (yellowing of the skin and eyes)
- ↳ Nausea and vomiting
- ↳ Abdominal pain
- ↳ Loss of appetite
- ↳ Dark urine
- ↳ Clay-coloured stool
- ↳ Fever
- ↳ Muscle or joint pain

in some cases hepatitis can be asymptomatic in the early stages or it can be chronic and lead to liver damage, cirrhosis or liver cancer if left untreated.

Prevention:-

1 Vaccination:-

Vaccine available for hepatitis A and B. Vaccination is the most effective way to prevent from these types.

2 Good hygiene:

For hepatitis **A** and **E** washing hands thoroughly with water, especially after using bathroom and handling food, is important.

3 safe practices:

Avoid sharing needle or personal items that may have come in contact with blood.

Safe sex practice can prevent from hepatitis B and C.

4 Avoiding alcohol:

Limiting and avoiding alcohol can help prevent alcoholic hepatitis.

5 screening and safe medical practices:

Ensure that blood products are screened for hepatitis viruses and always use of sterilized needles and medical equipment can prevent from it. Especially in Pakistan's government hospitals this step should be followed.

Hepatitis:

Hepatitis is a condition that can range from mild to severe, with some types potentially leading to chronic liver diseases like cirrhosis and liver cancer.

Prevention mainly focuses on vaccination, good hygiene, safe food practices and avoiding liver-damaging substances.

Early diagnosis and treatment are crucial for managing hepatitis and preventing long-term complications.

Q#2

Elaborate few methods of food preservation:

Food preservation is any of a number of methods by which food is kept from spoilage after harvest or slaughter. It refers to methods used to extend the shelf life of food, prevent spoilage and maintain its nutritional value, texture and flavour. Techniques are used based on the type of a food. There are some methods of food preservation.

Methods:-

Physical methods:-

↳ Canning

↳ Freezing

↳ Drying

↳ Smoking

↳ Vacuum sealing

Chemical methods

↳ Pickling

↳ Sugar preservation

↳ Fermentation

I Canning:

Physical method:-

It involves placing food in airtight container and then heating them and kill microorganisms that cause spoilage. The process cause vacuum that prevent air from entering and recontaminating the food.

Types of canning:

Water bath canning

Pressure canning

Advantage: ↳ long shelf life,

↳ convenient storage

↳ allows for a variety of food

↳ to be preserved.

Disadvantage:

↳ nutrient loss from high heat

↳ time consuming

I Freezing:

slow down the growth of microorganisms and preserves the texture and nutritional value of food by turning water in the food into ice

Advantage: Retain most of the food nutrients and texture

Disadvantage: Freezer burn can occur if food isn't properly wrapped

II Drying:

Drying removes moisture from food which is necessary for microbial growth. The lack of water makes it difficult for bacteria, molds, yeast to thrive. Types:

I Air drying

II Sun drying

III Oven drying

IV Dehydrators

III Salting

It is one of the oldest methods of food preservation. It works by drawing moisture of the food which inhibits growth of (bacteria) microorganisms
Used in: meat, fish, and some vegetables

Smoking:

It involves exposure of food to smoke from burning wood or other material. It is commonly used for meats and fish.

Method: Food is either cold smoked (at low temperature) or hot-smoked.

Vacuum sealing:

Vacuum sealing involves removing air from plastic bag and sealing it tightly around the food. This method prevents oxygen from reaching the food, which inhibits the growth of aerobic bacteria and molds.

Chemical method:

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Pickling:

Pickling preserve food in an acidic solution usually vinegar or brine. The acid prevent spoilage of food by lowering the pH which inhibits grow of bacteria.

Fermentation:

Fermentation is a natural process that uses beneficial bacteria or yeast convert sugars in food into alcohol or acids which act as preservatives common in dairy products, vegetables and beverages.

Sugar preservation:

Sugar acts as a preservative by drawing moisture out of food and creating an environment that not appropriate to microorganisms. It is commonly used for preserving fruits.

The fruit is (commonly) often cooked with sugar to make jams, jellies and preserves or it can be candied by coating in sugar.

Conclusion:

Food preservation is an essential process for extending the shelf life of food, maintaining its nutritional value and preventing foodborne illnesses. The method chosen depends on the type of food, available resources and the desired flavour and texture outcomes.

Q#3

Explain Fertilizers & Type

Fertilizers are substances added to soil or plants to supply essential nutrients that promote healthy growth and improve agricultural productivity. It helps replenish nutrients that may lack in the soil, ensuring plants receive necessary elements for development.

Types of Fertilizers:

Organic Fertilizers:

↳ They are derived from natural sources such as plants, animals or minerals.

Examples: Compost, manure, bone meal
These improve soil structure and encourage beneficial microbial activity.

Inorganic Fertilizers:

↳ They are manufactured chemical process and provide specific nutrients.

Example: Urea, Ammonium nitrate and superphosphate.

They offer rapid nutrient availability but can harm soil health over time.

Complete Fertilizers:

↳ contain all three primary nutrients.

↳ Nitrogen (N) & Phosphorus (P) & Potassium (K)

Examples NPK fertilizer

These provide balanced nutrition for plants.

Nitrogen Fertilizers

↳ primarily provide nitrogen, which is essential for leaf and stem growth.

Examples: ammonium sulphate, Urea

Excess nitrogen can lead to environmental issues like water pollution

Slow-release fertilizers

↳ or gradually release nutrients over time reducing the risk of over fertilizers

Examples: coated urea, organic fertilizers (composts)

The fertilizers provide consistent nutrient supply with less risk of leaching.

↳ Each type of fertilizer serve differently needs based on plant requirements and soil conditions.

Q#1 Explain lipids: Types & functions

Lipids:

Lipids are naturally occurring substance. It is mostly commonly known as fats and oils. Lipids provide 9.1 Calorie energy program. They contribute to cell structure, provide stored fuel and also take part in many biological process.

Types of lipids:

⇒ Saturated fat

⇒ Trans fat

Saturated fat

It is solid at room temperature

It is mostly present in animal

foods such as milk, cheese

and meat. poultry and fish have

less fat than red meat. saturated

fat can raise cholesterol. A healthy

diet has less than 10% of saturated fat

Trans fat:

oil is a fat that has been changed by a process called hydrogenation. The process increases the shelf life of fat.

- Present in:
- ↳ Processed snack foods, chips
- ↳ cookies

Unsaturated fat

oil is liquid at room temperature. oil is mostly in oils from plants. oil help improve cholesterol level in a body. Types:

- ↳ Monosaturated
- ↳ poly saturated

Monosaturated:

Present in

↳ Avocado, nuts and vegetable oils

Polysaturated:

Present in

• vegetable oil such as

↳ soybean ↳ sunflower ↳ soybean oil

Fun

Functions of lipids:

lipid perform several biological functions:-

Storage:

lipids are storage compounds. Triglyceride serve as reserve energy of the body.

important components:-

They are important components of cell membrane structure of eukaryotic cells.

Role in membrane permeability:-

Regulates membrane permeability source of fat soluble vitamins

They serve as a fat soluble vitamins like A, D, E, and K

electrical insulators

act as electrical insulators to the nerve fibres where the myelin sheath contains lipids

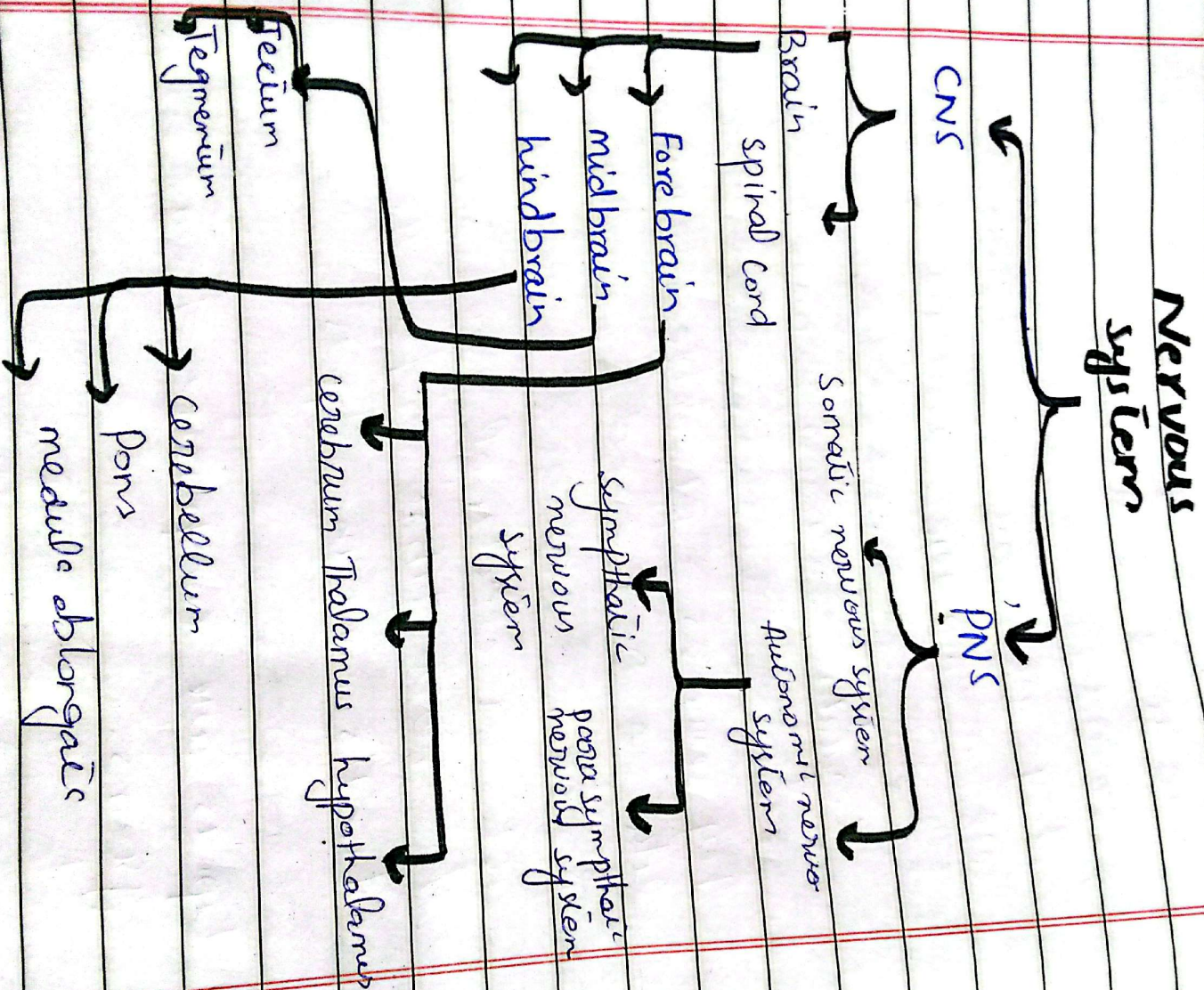
Component of enzymes:

Lipids are component of some enzyme systems.

Role of Brown fat

Body temperature maintenance is done by brown fat

Q12. Nervous system of the human body:



Q#3

Hydrogen bonding:

Interaction involving a hydrogen atom is called hydrogen bonding. It is a special type of dipole-dipole interaction that occurs when a hydrogen atom covalently bonded to a highly electronegative atom interacts with a lone pair of electrons on another electronegative atom.

Types of hydrogen bond:

intramolecular hydrogen bonding

between molecules of

EX#1. water (H_2O)

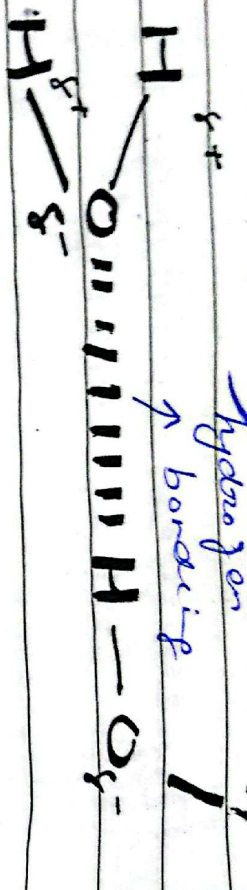
intermolecular hydrogen bonding

Example#

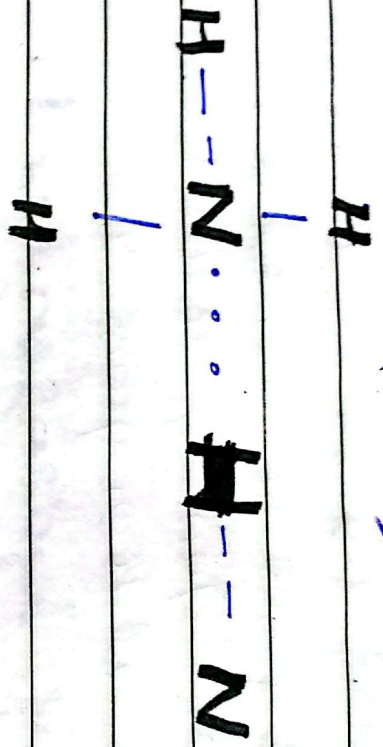
ortho-nitro phenol

Examples of hydrogen bonding:

Water (H₂O)



Ammonia (NH₃)



Hydrogen Fluoric Acid (HF)



Section #2

(a)

9) If sum of (3) digits number is 15.
 Sum of 10th unit digit is 12. The
 difference of the unit from 10th digit
 is equal to 2. What is the three
 digit number?

Answer:

① — Sum of three digit = 15
 $a + b + c = 15$
 Sum of 10 and unit digit is = 12

② — $a + b + c = 12$

difference of 10 unit digit and the unit is 2.

③ — $b - c = 2$

Solve B and c:

2nd $(b + c)$ 3rd $(b - c)$

Add the (2) equations:

$$(b + c) + (b - c) = 12 + 2$$

$$2b = 14$$

$$b = \frac{14}{2} = 7$$

$$\boxed{b = 7}$$

Put in $(b + c)$

$$7 + c = 12$$

$$c = 12 - 7$$

$$\boxed{c = 5}$$

Find a:

$$b = 7$$

$$c = 5$$

$$a + b + c = 15$$

$$a + 7 + 5 = 15$$

$$a + 12 = 15$$

$$a = 15 - 12$$

$$a = 3$$

The three digit number is

$$\overline{abc} = 375$$

(b)

Given:

$$\text{Ratio of size} = 2:3:4$$

$$\text{Weight of each slice} = 40\text{ gm}$$

$$\text{Price of smaller pizza} = \text{Rs } 320$$

Calculations:

number of slices:

$$2x + 3x + 4x = 18$$

$$9x = 18$$

$$x = \frac{18}{9}$$

$$x = 2$$

number of slices of each pizza:

$$\text{small pizza} = 2(2) = 4 \text{ slices}$$

$$\text{Medium pizza} = 3(2) = 6 \text{ slices}$$

$$\text{Large pizza} = 4(2) = 8$$

$$\text{Total} = 4 + 6 + 8 = 18$$

$$\text{Total weight} = \text{Total slices} \times \text{weight of each slice}$$

$$= 18 \times 40$$

$$\boxed{\text{Total weight} = 720 \text{ gm}}$$

$$\text{small pizza slice} = 4$$

$$4 \text{ slice} = \text{RS } 390 = \frac{390}{4}$$

$$1 \text{ slice} = \text{RS } 80$$

$$18 \text{ slices} = 80 \times 18$$

$$\boxed{= 1440 \text{ Rs}}$$

Q# Diameter of the circle is 6cm. Find circumference and area of circle:-

Circumference =

$$C = \pi \times d$$

Area

$$A = \pi \times r^2$$

Given: $d = 6$

$$r = \frac{d}{2} = \frac{6}{2} = 3 \text{ cm} \rightarrow \frac{6}{2}$$

$$C = \pi \times 6 = 6\pi \approx 18.85$$

$$A = \pi \times (3)^2 = \pi \times 9 = 9\pi \approx 28.27$$

Final answer

Circumference = 18.85 cm

Area = 28.27 cm²

Q₄

Identify the missing

13, 24, 46, 90, 178,

$$24 - 13 = 11$$

$$46 - 24 = 22$$

$$90 - 46 = 44$$

$$178 - 90 = 88$$

differen is 11, 22, 44, 88

next differ

$$88 \times 2 = 176$$

Add next diff

$$178 + 176 = 354$$

13, 24, 46, 90, 178, 354

②

5, 6, 9, 14, 21

$$6 - 5 = 1$$

$$9 - 6 = 3$$

$$14 - 9 = 5$$

$$21 - 14 = 7$$

difference or 1, 3, 5, 7 increases
by +2

next difference

$$7 + 2 = 9$$

Add next difference

$$21 + 9 = 30$$

5, 6, 9, 14, 21, 30