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Q₁ Dengue (break-bone fever) Def/Sx/Tx/Prevention?

Ans:- Introduction:

Dengue is a viral infection caused by the dengue virus (DENV), transmitted to humans through the bite of infected mosquitoes. Dengue virus represents a major emerging arthropod-borne pathogen. Dengue virus infects 100-400 individuals annually. The disease is endemic to more than 100 countries throughout Africa, the Americas, the Eastern Mediterranean, South-East Asia and the Pacific. Dengue is transmitted by several species of mosquitoes of the genus *Aedes*, principally *A. aegypti*.

No need for an introduction for a 5 marks answer

Symptoms:

Most people with dengue have mild or no symptoms but if they do occur, they usually begin 4-10 days after infection and last for 7-10 days. Symptoms may include:

- High fever (104°F)
- Severe headache
- Pain behind the eyes
- Muscle and joint pain
- Nausea
- Vomiting
- Swollen glands
- Rash.

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Individuals who are infected for the second time are at a greater risk of severe - dengue whose symptoms are:

- severe abdominal pain
- Persistent vomiting
- Rapid breathing
- bleeding gums and nose
- restlessness
- Blood in vomit or stool
- Being very thirsty

Treatment:

- There is no specific treatment for dengue. The focus is on treating pain symptoms.
- Acetaminophen (paracetamol) is often used to control pain.
- Sometimes the doctors prescribe drugs that are used to treat malaria.
- IV fluids are given to prevent dehydration.
- For severe dengue, hospitalization is often needed.

Prevention:-

To protect yourself:

- Stay away from heavily populated residential areas.
- Use mosquito repellents even indoors.
- When outdoors wear long sleeve shirts, and long pants tucked with socks.
- Use mosquito nets when sleeping.

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Q₂) Hepatitis, def / Types / Transmission / Sx / Tx?

Ans -

Hepatitis:

It is an inflammatory condition in which inflammation of the liver is caused by viruses, bacterial infections, or by continuous exposure to alcohol, drugs, or toxic chemicals, such as those found in aerosol sprays and paint.

Symptoms:

- General weakness and fatigue
- Loss of appetite
- Fever
- abdominal pain and tenderness.
- Jaundice: yellowing of skin and eyes that occurs when liver fails to breakdown excess yellow-colored bile-pigments in the blood.

Types of hepatitis:

(a) Hepatitis A virus:

It lives in the feces in the intestinal tract

⇒ Transmission:

It is spread when an infected person doesn't wash their hands after defecating and then handle food. It can also contaminate the drinking water through raw sewage.

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⇒ Symptoms :-

Along with the general hepatitis symptoms, it can cause the following symptoms:

- Nausea
- Fatigue
- Diarrhea.

⇒ Treatment:

There is no treatment of hepatitis A. Most people will recover on their own. But in some serious cases liver transplant may be required.

(b) Hepatitis B virus:

It lives in blood and other bodily fluids.

⇒ Transmission:

It is spread from person to person through unprotected sexual contact through sharing of needles or any sharp objects that break the skin. Babies born of infected mothers have 10 to 95 percent chance of getting infected.

⇒ Treatment:

The only drug currently available for the hepatitis B virus is Interferon.

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which is only effective 30-35 percent. Liver transplant is beneficial for the infected person but the virus remains in the blood even after the transplant. And may attack the infected liver.

(c) Hepatitis C virus:

⇒ Transmission:

It is a slowly spreading infection that is primarily spread by intravenous drug users. It can also be spread by sharing razors, toothbrushes and contaminated needles with infected persons, and from mother to child during childbirth.

⇒ Treatment:

Interferon is used in combination with an antiviral drug ribavirin. Although this works only for 20-30% of patients.

General preventions of hepatitis:

- Safe and effective vaccines are available for hepatitis A and B.
- Immune globulin injections can prevent hep A & B if given within two weeks of exposure.
- HCV, HGV and HEV have no vaccines and the prevention against these is to reduce exposure to the bodily fluids of the infected persons.

Q) - Classification of carbohydrates.

Ans) -

Carbohydrates:

Carbohydrates are the most abundant organic compound on earth. It is estimated that more than 50% of the organic content on Earth is made up of carbohydrates. The name carbohydrate is derived from two words: "carbo" meaning carbon and "hydrate" meaning water. The ratio of carbon, oxygen and hydrogen in these molecules is:

1 (carbon) : 2 (Hydrogen) : 1 oxygen.

As we can see the formula: $C_n(H_2O)_n$

Uses of carbohydrates:

(i) Source of energy:

- Carbohydrates are used as main source of energy in animals. During respiration C-H bonds are broken and provide energy.

(ii) Storage molecules:

- They are stored in cells as reserve food for future use.

(iii) Structural building material:

- Cellulose is structural component in plants.
- Chitin forms the exoskeleton of arthropods.

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Classification of carbohydrates:

(a) Monosaccharide:

- Simplest carbohydrates.
 - "mono" = one, "saccharon" = sugar.
 - They are building units that combine to form other carbohydrates.
 - They have a chain of carbon atoms called "carbon backbone".
 - On the basis of number of carbon atoms in this chain; monosaccharides are classified.
 - Soluble in water.
- Trioses = 3-carbon backbone
 - Pentoses = 5-carbon backbone
 - Hexoses = 6-carbon backbone

Examples:

(i) Glucose:

- Most abundant monosaccharide in humans.
- 6-carbon sugar.
- Chemical formula

(ii) Fructose:

- Most abundant carbohydrate in plants.
- It is the sweetest sugar (30% sweeter than glucose).
- Many soft drinks are sweetened with "high fructose corn syrup".

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(b) Disaccharides:

→ Combination of two monosaccharides form a disaccharide. During this process of linking removes a water molecule. Thus this process is called dehydration synthesis.

→ They are soluble in water but are too big to pass through the cell membrane.

Examples:



(c) Polysaccharides:

They are most abundant carbohydrates in nature. They are composed of hundreds or thousands of monosaccharide units.

Three polysaccharides are most important to living organisms. They are Starch, glycogen and cellulose.

Examples:

(i) Starch:

- Most important source in human diet
- Formed in plants
- Commonly found in seeds
- Amylose is a component of starch.

(ii) Glycogen:

- It is also called animal starch
- Useful for cell functions
- Most abundant in liver and muscle cells

(iii) Cellulose:

- Found only in Plants
- Structural component of plant cell wall
- Cotton and paper = 95% cellulose
- Wood = 50% cellulose
- Humans cannot digest the cellulose found in plants.
- It acts as a roughage in human diet which helps in digestion.

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Q) Classification and functions of Proteins.

Ans) Proteins:

The name protein is derived from the Greek word 'proteos' meaning 'Prime Importance'.

Characteristics:

- They are polymers of amino acids.
- They are colorless and tasteless.
- There are 10,000 different types of proteins in the human body.
- Their solubility depends upon the PH (Solubility increases with increasing acidity and alkalinity).
- They contain elements, carbon, hydrogen, oxygen and nitrogen.
- They may also contain Phosphorus, Iron, Copper, Iodine, Zinc and Sulphur.

Classification of Proteins:

(A) On the basis of physical & Chemical properties:

① Simple Proteins:

Those proteins which only contain amino acids as their structural component and no "non-protein" part is attached to them. On decomposition with acids they liberate constituent amino acids.

They are mostly globular. Examples are cellulose, globulin, collagen etc.

### ② Compound / conjugated Proteins:

Those proteins which are attached to some non-protein group which is called 'prosthetic group' are known as compound proteins. Examples are lipo-proteins, Phospho-protein etc.

### ③ Derived proteins:

Proteins which are derived from simple or compound proteins from the action of heat, enzymes or any chemical agent. Their examples are: Peptones, Peptides and proteoses.

## (B) Based on the structure of Proteins:

### ① Primary proteins:

Primary structure of protein is the linear structure of amino acids, joined together by peptide bonds, that make up the polypeptide chain.

### ② Secondary protein:

When the linear, unfolded structure of the polypeptide chain assumes the helical structure. This represents the regular folding pattern of the chain.

### ③ Tertiary Protein:

The three-dimensional structure assumed by the bending and twisting of the polypeptide chain is known as tertiary protein. The linear structure of the polypeptide chain is turned into the globular structure.

### Importance of Proteins:

- The basic foundational structure of the human body.
- Used in the building and repairing of tissues.
- Can be used as fuel when the carbohydrate intake is low.
- One of the 'macronutrients' so large quantities are necessary for healthy living.

Q) Classification of Lipids.

Ans):

→ Lipids.

The word lipids is derived from the word "Lipos" meaning fat. Primary building blocks of lipids are fatty acids, glycerol & sterols.

→ Characteristic:

- ① They are the most heterogeneous group of substances.
- ② They are insoluble in water.
- ③ They are soluble in organic compounds like ether, alcohol and acetone.
- ④ Fats, oils and sterols are the most important lipids found in nature.
- ⑤ They have an important role in human diet.

→ Classification:

① Simple lipids:

They are compounds of fatty acids and glycerol. eg: fats and oils.

② Compound lipids:

These are the compounds of fatty acids with glycerol and possess additional groups also. For example: Phospholipids, Glycolipids, lipoprotein.

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### ③ Derived lipids:-

They are compounds derived from simple and compound lipids through hydrolysis. For example: Sterols, Vitamin D, Terpenes etc

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