

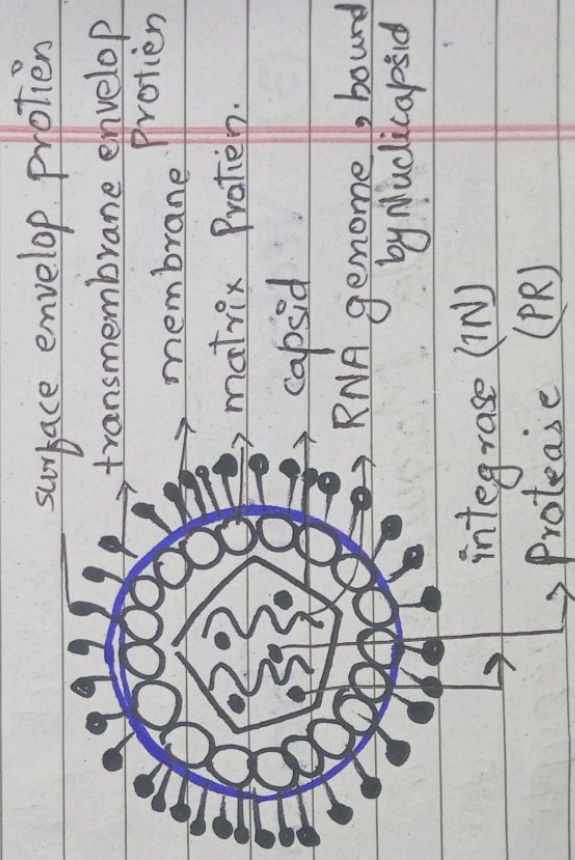
Date: _____

M T W T F S

Q11@ What is dengue? Give a brief account of its causative agents and its symptoms.

1- Definition of Dengue:

Dengue is a viral infection transmitted by mosquitoes, specifically *Aedes* species. It is prevalent in tropical and subtropical regions and poses a significant public health risk due to its high morbidity and occasional severe complications.



2- Causative Agent:

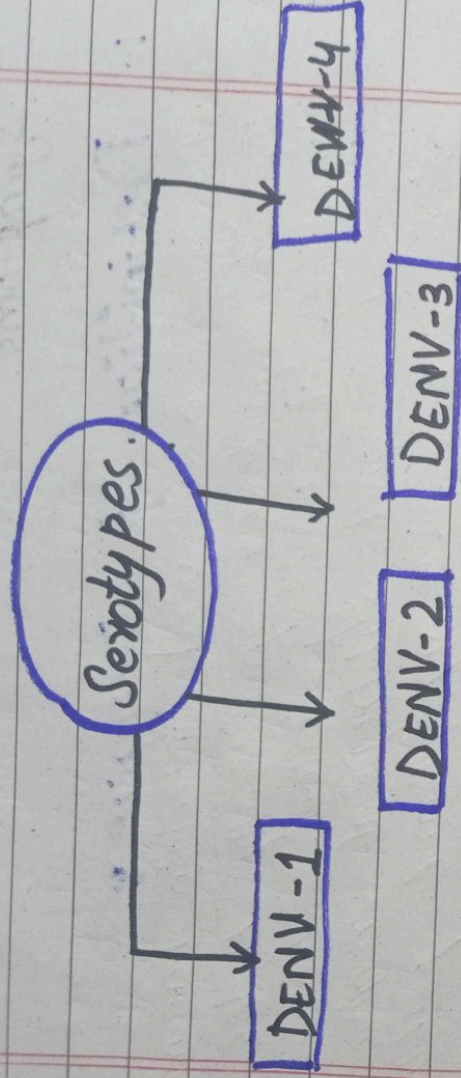
Dengue virus (DENV):

Dengue is caused by the dengue virus, a member of the Flaviviridae family. It has four distinct but related serotypes: DENV-1,

Date: _____

M T W T F S S

DENV-2, DENV-3, and DENV-4.



Infection with one serotype but not to the others, which is why people can contract dengue up to four times.

③ Vectors of Transmission:

Aedes Mosquitoes: The primary carriers of the dengue virus are *Aedes aegypti* and *Aedes albopictus* mosquitoes. These mosquitoes typically breed in standing water near human habitations and are most active during dawn and dusk.

⑤

①

②

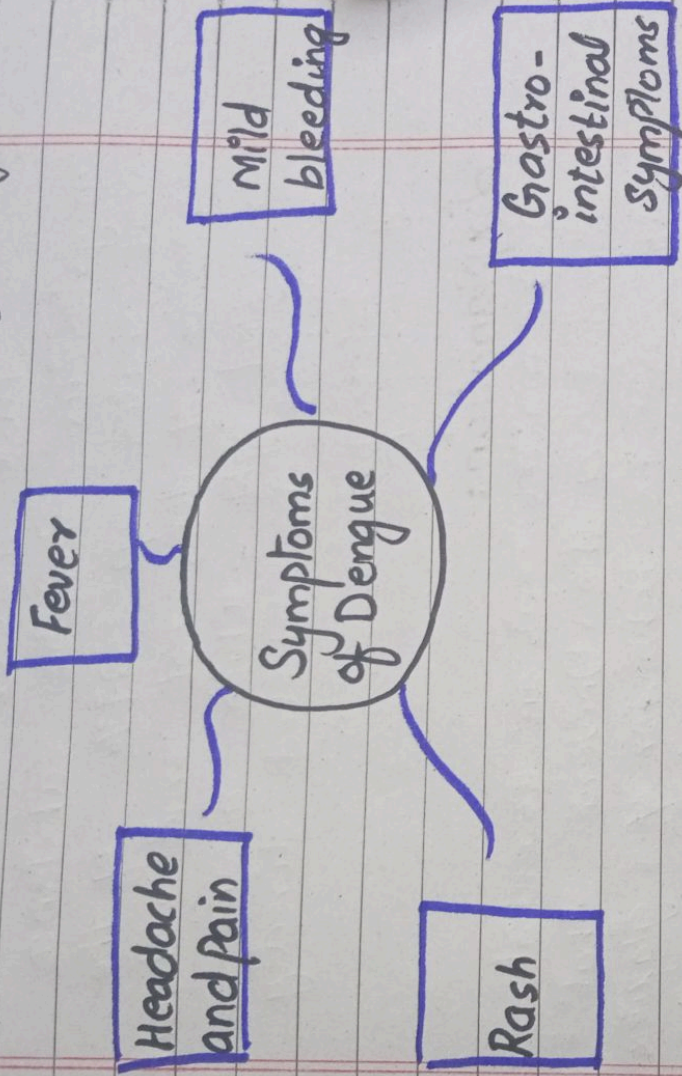
Th S

Date: _____

M T W T F S

4 Symptoms of Dengue:

Following are the symptoms of dengue:



5 Severe Complications:

(a) Dengue Hemorrhagic Fever (DHF)

In some cases, dengue may progress to DHF, characterized by severe bleeding, blood plasma leakage, and low platelet counts.

(b) Dengue Shock Syndrome (DSS)

The most severe form, DSS, involves shock due to fluid loss and can be fatal without prompt medical intervention.

Date: _____

M T W T F S

⑥ Explain dark matter and dark energy.

① Dark Matter:

Dark matter is a mysterious invisible substance that makes up 27% of the Universe. It does not emit, absorb, or reflect light, which means it cannot be detected directly by telescopes.

Explanation:

Dark matter is an essential component of the Universe that influences the behavior of galaxies and plays a critical role in the overall structure and evolution of the Cosmos.

② Function of Dark Matter:

Gravitational Binding

helps bind galaxies together, allowing them to rotate at high speed.

Influence on Cosmic

Microwave

Background

there is tiny fluctuations

providing clues about the Universe's age, composition and evolution.

Formation of

Cosmic Structure

Providing scaffolding for galaxies to form in the early universe

(C) Discuss structure and function of mitochondria. How is it the power house,

(a) Mitochondria:

Mitochondria are double-membrane-bound organelles found in nearly all eukaryotic cells, often referred to as the "power house of the cell". They are responsible for producing adenosine triphosphate (ATP).

Final Structure of Mitochondria

(1)

Outer Membrane:

The outer membrane is smooth and permeable to small molecules and ions due to the presence of porins. It serves as a barrier between the cytosol and the inner environment of the mitochondrion.

(2)

Inner Membrane:

The inner membrane is highly folded into structure called cristae, which increases the surface area for chemical reactions. This membrane is permeable to most ions and molecules.

(3)

Intermembrane Space.

The space between the outer

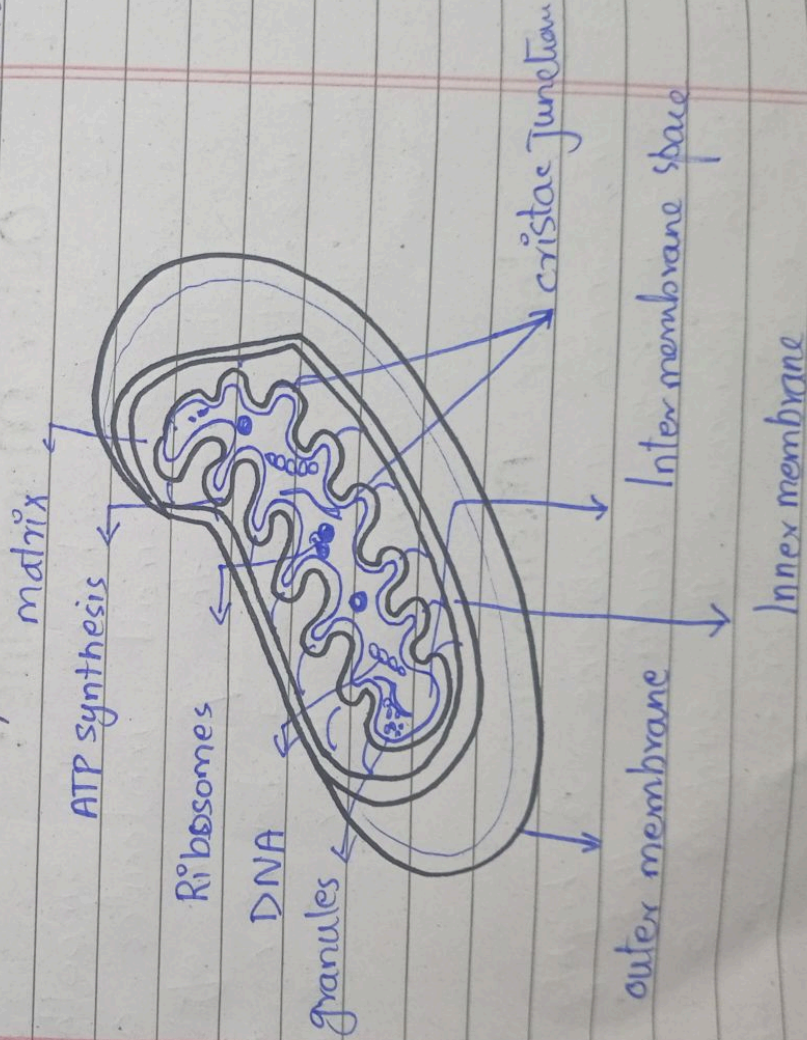
Date: _____

(M) (T) (W) (T) (F) (S)

and inner membranes, where protons are pumped during electron transport, contributing to the proton gradient necessary for ATP production.

(4) Matrix

The inner compartment containing enzymes for the Krebs cycle, mitochondrial DNA (mtDNA), ribosomes, and various metabolic substrates. This matrix is the site of important metabolic reactions.



Date: _____

M T W T F S

③ Dark Energy:

Dark Energy is an even more mysterious force that makes up about 68% of the universe. It is believed to be responsible for the accelerated expansion of the Universe, pushing galaxies apart at increasing rate. Unlike dark matter which has gravitational pull, dark energy exerts a repulsive force the counteracts gravity on large scales.

• Explanation:

Dark energy is dominant force in the Universe, shaping its expansion and influencing its long-term evolution.

Function of Dark Energy:

Cosmic Expansion	Influencing the Universe's fate	Influence on Large-Scale structure
Responsible for the observed accelerated expansion of the Universe	→ Determine the ultimate fate of the Universe. → It continues to drive expansion, the Universe could reach "Big Freeze"	Shapes the structure of the universe by acting against gravitational attraction

Date: _____

Comparison of Dark matter and Dark Energy:

Aspect	Dark Matter	Dark Energy
Composition	Unknown likely particles	Unknown Possibly a field or vacuum energy
Role in the Universe	Adds gravitational pull binds galaxies	Causes accelerated expansion
Percentage of Universe	~27%	~68%
Detection	Indirect (gravitational effects)	Indirect (cosmic expansion)

Function of Mitochondria.

① ATP Production:

Mitochondria generate adenosine triphosphate (ATP), the energy currency of the cell, primarily through oxidative phosphorylation.

② Cellular Respiration:

Mitochondria are key players in cellular respiration, which includes:

- (a) Glycolysis.
- (b) Krebs cycle (Citric Acid cycle).
- (c) Oxidative phosphorylation.

③ Regulation of Metabolism:

Mitochondria regulates various metabolic pathways, including metabolism of carbohydrates, lipids and proteins.

③ Apoptosis:

Mitochondria plays a role in programmed cell death (apoptosis) by releasing cytochrome c, which activates caspases and triggers the apoptotic pathway.

④ Emotional Responses:

It processes emotions.

Date: _____

M T W T F S

Date: _____

Mitochondria as the Powerhouse.

Mitochondria are called the powerhouse of the cell because:

Energy Production

They produce ATP through oxidative phosphorylation which provides energy for various cellular processes.

Efficiency

Mitochondria efficiently convert the energy stored in nutrients into usable energy ATP through a series of biochemical reactions.

Adaptability

They can adjust ATP production based on the cell's energy demands, making them essential for maintaining cellular homeostasis.

Date:

M T W T F S

Q2 Give Structure and function of Human brain. why it is control center?

Structure Of Human Brain:

1- Cerebrum.

It is the largest part divided into two hemispheres and four lobes (frontal, Parietal, temporal, occipital). It controls higher functions like thinking movement, and sensation.

2- cerebellum:

It is located at the back, it coordinates balance and movement.

3- Brain stem:

It connects the brain to the spinal cord and controls basic functions like breathing and heart rate.

4. Diencephalon:

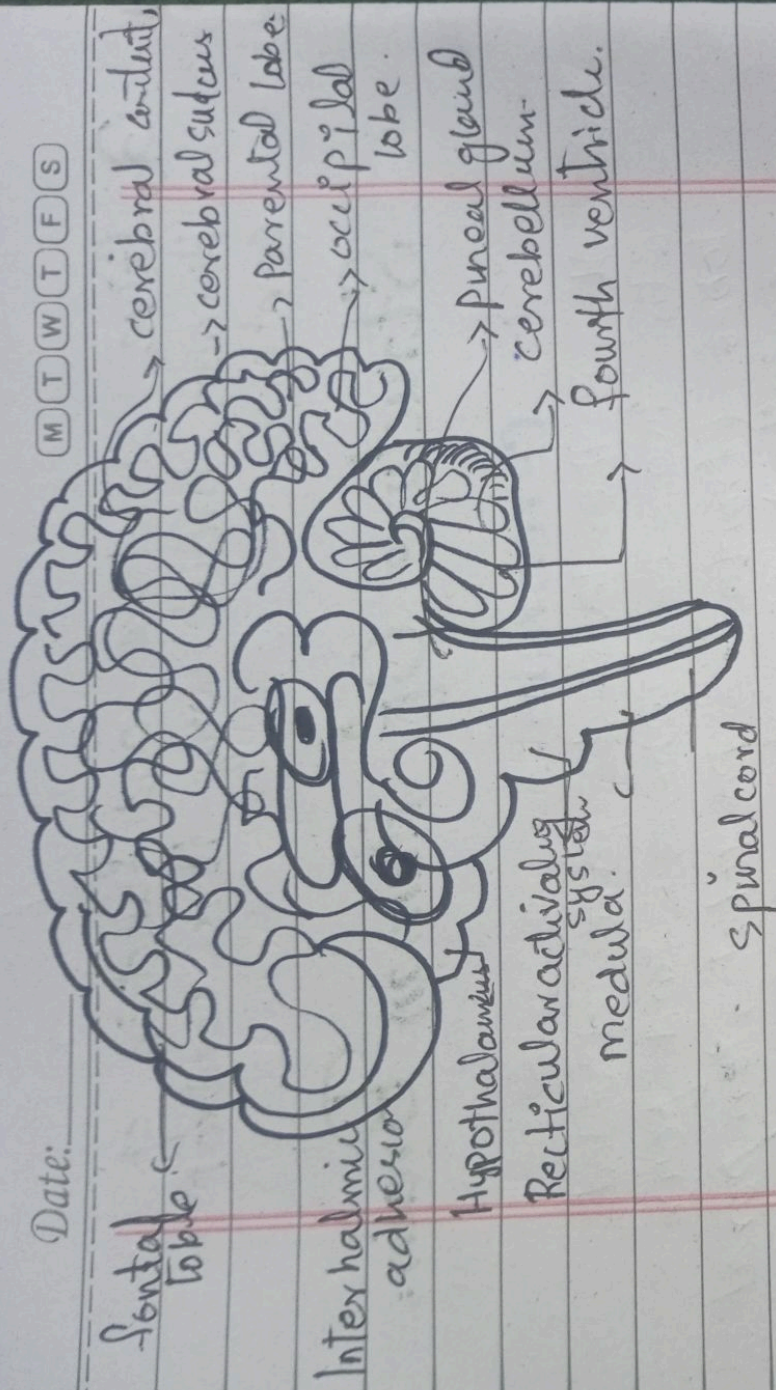
It includes the thalamus (sensory relay) and hypothalamus (regulates body temperature, hunger, and thirst).

5. Limbic System

It involved in emotions and memory, including structures like the hippocampus and amygdala.

Date: _____

M T W T F S



Function of Human Brain:

① Cognition:

Helps in thinking, learning, and memory.

② Sensory Processing:

Interprets sensory information (sight, sound, touch).

③ Motor Control:

Coordinates movements

④ Homeostasis Regulation:

maintains internal balance (temperature, hunger)

Date: _____

M T W T F S

Why is the brain the control center?

Because

(a) It integrates information from the body and environment.

(b) It coordinates bodily functions and movements.

(c) It regulates vital processes like breathing and heart rate.

(d) It enables complex thought and decision-making.

Date: _____

M T W T F S

⑤ DRM (Disaster Risk Management).

Disaster Risk management refers to the systematic process of identifying, assessing, and reducing the risks of disasters. It encompasses a range of activities aimed at minimizing the impact of disasters on communities and ensuring their preparedness for potential hazards.

DRM Involves.

- ① **Risk Assessment:**
It identifies hazards and vulnerabilities to evaluate the potential impact of disasters.
- ② **Prevention and mitigation:**
It implements measures to reduce the likelihood of disasters and lessen their effect.
- ③ **Preparedness:**
It develops plans and strategies to ensure communities are ready to respond effectively in the event of a disaster.
- ④ **Response:**
It coordinates immediate actions.

Date:

M T W T F S

to address the needs of affected populations during and after disaster.

③ Recovery

It implements strategies to restore and improve the resilience of communities after a disaster.

→ Situation Of DRM In Pakistan

Pakistan is prone to variety of natural disasters, including earthquakes, floods, and draughts. making it effective DRM crucial.

Here is the overview.

④ Vulnerability to disaster:

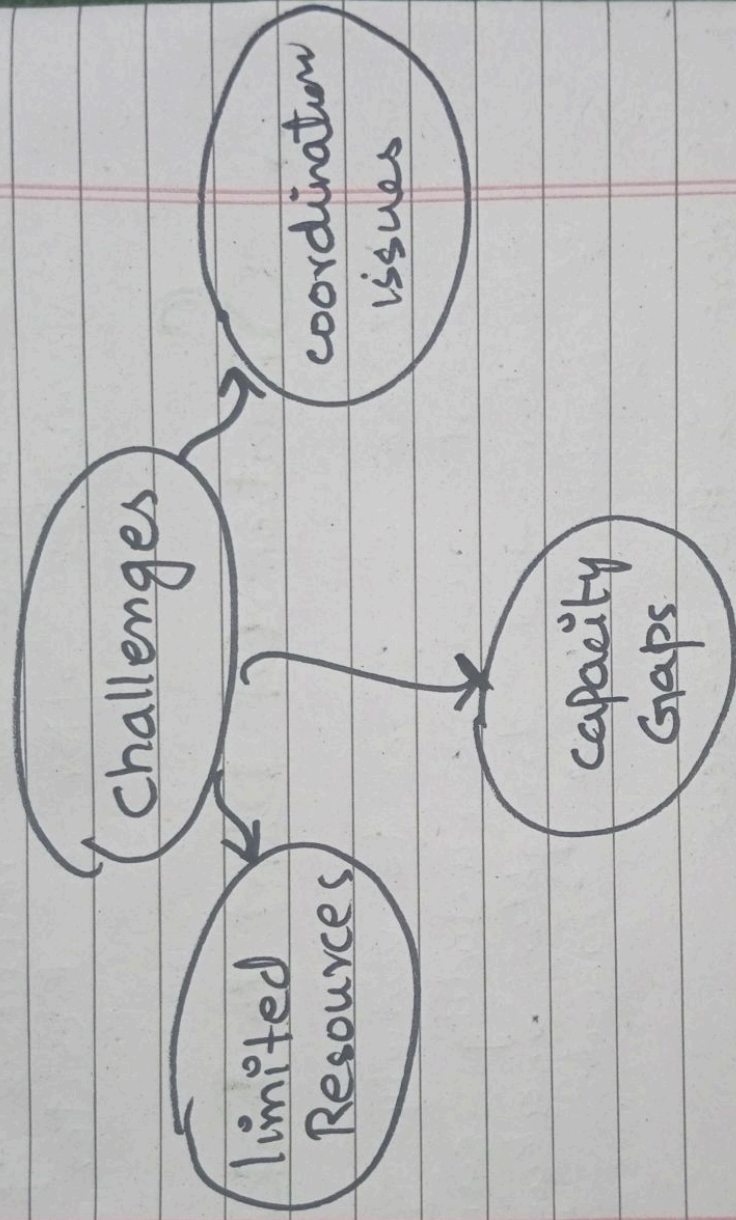
Pakistan is one of the most disaster-prone countries in the world, facing significant risks from climate change including increasing frequency and intensity of floods, heatwaves, and glacial lake outburst floods.

⑤ Legislative frame work.

The National Disaster Management Act 2010 established the

Date: _____

National Disaster Management Authority (NDMA) to lead disaster management efforts
Provincial disaster management efforts.



Recent Developments:

The government has been increasingly focusing on climate resilience and disaster preparedness in the light of the recent climate-related disaster, emphasizing the need for sustainable development practices.

Date: _____

(M) (T) (W) (T) (F) (S)

② Fat-Soluble Vitamins:

Fat-soluble vitamins are a group of vitamins that dissolve in fats and oils and are stored in the body's fatty tissue and liver.

Types of Fat-Soluble Vitamins:

① Vitamin A (Retinol)

① **Function:** It is essential for vision, immune function, and skin health. It helps in maintenance of healthy epithelial tissues and is important for reproductive health.

② Sources

liver, fish, oils, dairy products, carrots, spinach, and greens leaves.

② Vitamin D

Function: Crucial for calcium absorption, bone health and immune function.

Sources: Sunlight exposure, fortified fish, dairy products, fatty egg yolks.

Date: _____

M T W T F S

iii Vitamin E

(a) Function:

Acts as an antioxidant, protecting cells from oxidative damage. It plays a role in immune function and skin health.

(b) Sources:

Nuts, seeds, vegetable oils, green leafy vegetables and cereals.

iv Vitamin K:

(a) Function:

It is important for blood clotting and bone health. It helps in the synthesis of proteins required for blood coagulation and bone metabolism.

(b) Sources:

leafy green vegetables (like kale and spinach), broccoli, and fermented foods.

Absorption And Storage:

(i) Absorption:

Fat-soluble vitamins are absorbed along with dietary fat through the intestinal lining. Bile salts released during digestion facilitate their absorption.

(ii) Storage:

These vitamins can be stored in the liver and adipose (fat) tissues, allowing the body to draw on these reserves when needed.

Deficiency And Toxicity:

Deficiency:

A deficiency in any of the fat-soluble vitamins can lead to specific health issues, such as:

- night blindness (Vitamin A)
- rickets (Vitamin D)
- anemia (Vitamin K)
- Increased bleeding (Vitamin K)

Date: _____

M T W T F S

Toxicity:

Because they are stored in the body, excessive intake of fat-soluble vitamins can lead to toxicity.

Example:

High doses of Vitamin A can cause liver damage, headaches and dizziness.