

Date: _____

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Q#2(a)

Lipids

"Lipids are naturally occurring organic compounds."

Lipids provide 9-1 calories per gram.

The basic unit of lipids is

triglycerides. These are present in foods and body. ~~The other class~~

They contain fatty acids and glycerol. The other class is

phospholipids. They are present in animals and plants. They

contain fatty acids, glycerol, low molecular weight alcohol.

Types of lipids:

Saturated fats:

These are solid at room temperature and also known as solid fats. They are present in animal foods (milk, cheese, meat), food made with butter. They cause high

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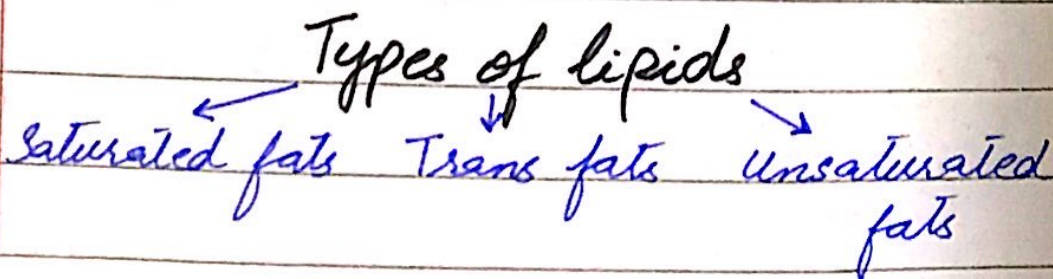
cholesterol level in body.

Trans fats:

They are changed by a process known as hydrogenation. They are ~~solid~~ at ~~room~~ temperature. This process makes them harder at room temperature. They cause high cholesterol level. They are present in processed foods like cookies.

Unsaturated fats:

They are liquid at room temperature. They maintain the cholesterol level. They are of two types: monosaturated fats and polyunsaturated fats.



Functions of lipids:

Lipids are source for fat soluble vitamins like A, D, E, K.

Lipids are components of enzyme system.

Important component of cell membrane in Eukaryotic cells.

Protect important organs of body like heart and kidney.

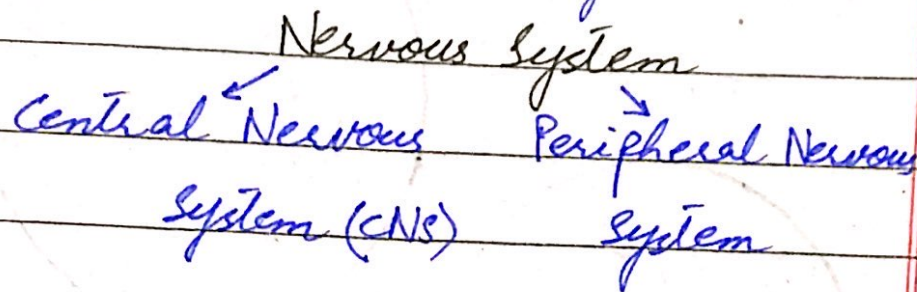
Regulate membrane permeability.

Deficiency of lipids
↓
Low energy provision

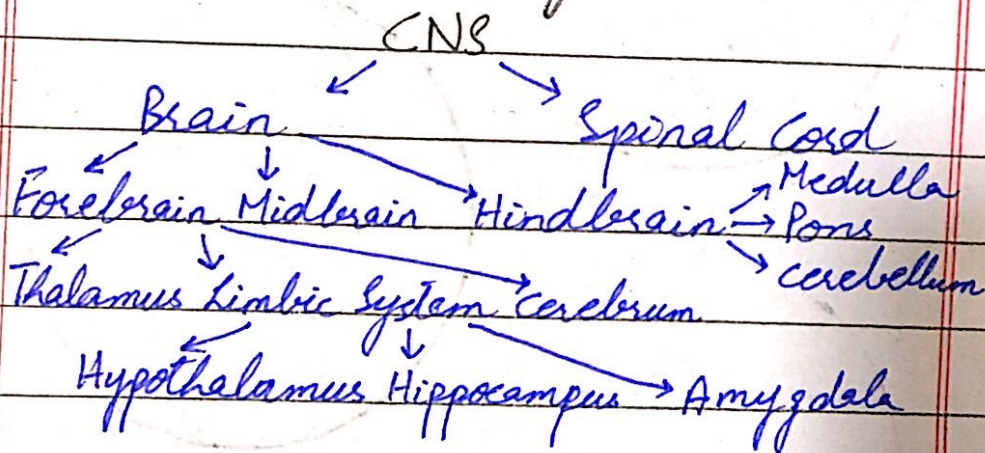
Excess of lipid
↓
High cholesterol level
↓
Heart issues

Human Nervous System

Nervous system consists of Central Nervous System and Peripheral Nervous System



Central Nervous System:



CNS is a processing center. It receives and sends information to PNS.

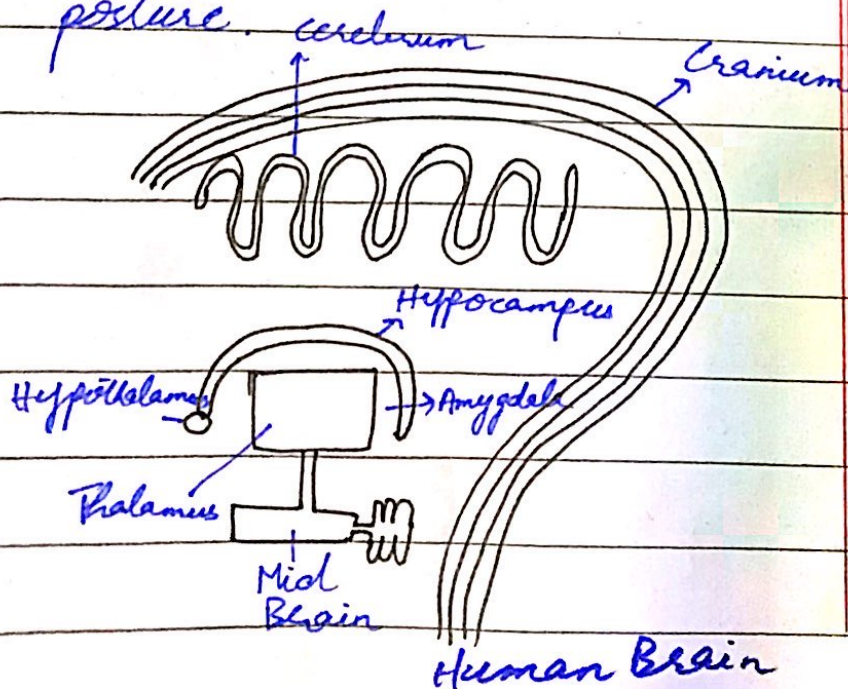
1) Brain:

Brain has 3 parts ^{3m} Forebrain,

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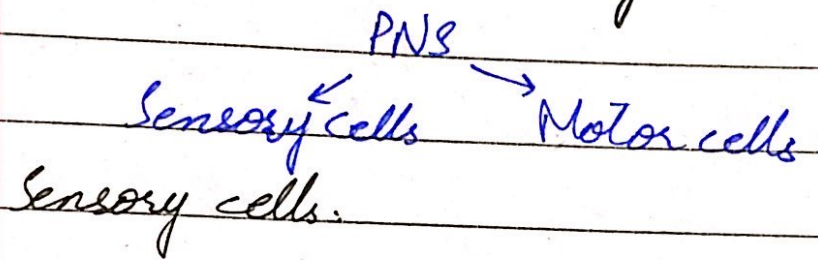
Thalamus receives information from 5 senses and send to limbic system. Limbic system control thirst, hunger, long term memory and emotions. Cerebrum is the large part of brain. It is associated with thought and action. Midbrain connects fore brain and hind brain. It controls the reflex and movement of eyes. In Hindbrain, medulla oblongata controls heart rate, breathing, blood pressure. Pons control sleep cycle and cerebellum controls body balance and posture.



2) Spinal cord:

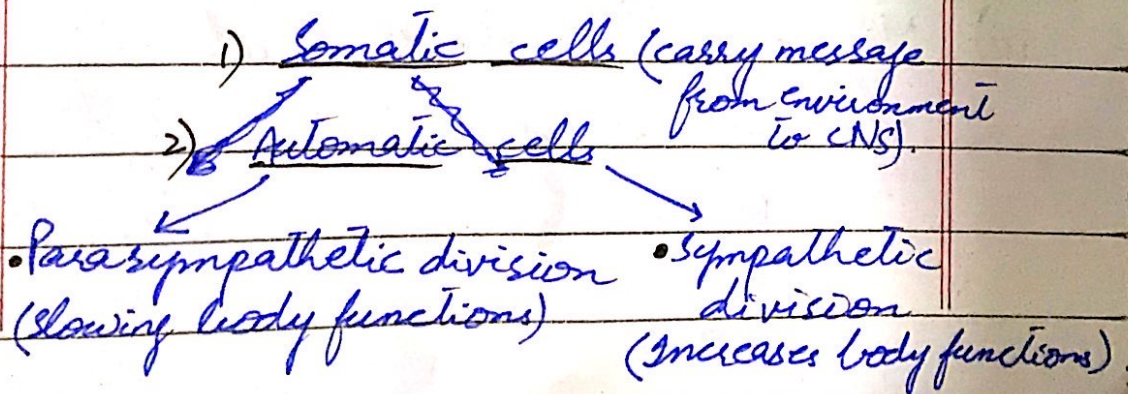
These are the bundle of nerve tissue, extends from lower part of brain down through spine. Various nerves branch out through entire body which forms the PNS.

Peripheral Nervous System:



Sensory cells carry message to CNS.

Motor cells carry signal from CNS to internal organs. Motor cells contain somatic cells and autonomic cells.



Energy conservation and its sustainable use

a) Measures for energy conservation and sustainable use:

i) Reduction in usage:

Several measure should be taken to minimize the energy usage in domestic, agricultural and industrial sectors. For example, electricity consumption in different sectors are:

Household: 49.7 GWh

Commercial: 7.8 GWh

Industry: 26.2 GWh

Agriculture: 10.07 GWh

Others: 6.6 GWh

iii) Minimum line losses and efficient transmission:

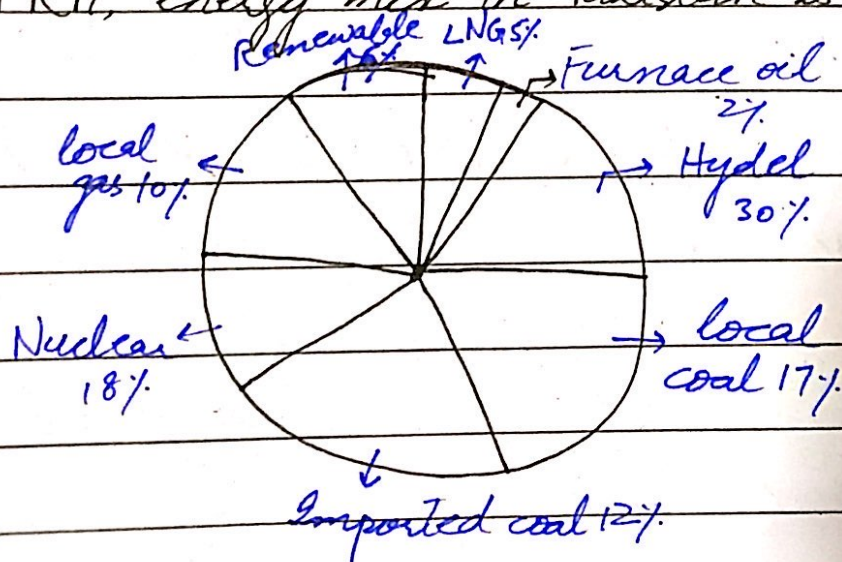
By ^{minimum} line losses and efficient

Transmission. energy can be stored.

For example, according to Economic survey of Pakistan 23-24, Pakistan's installed capacity is 42131 MW and Transmission capacity stands at 22000 MW.

Renewable energy resources:

Renewable energy resources can reduce the economic cost and provide the sufficient energy for all the consumers. Pakistan should also shift to renewable energy resources like solar, wind and thermal energy. According to the report of NEPRA, energy mix in Pakistan is



Energy Policy measures to reduce energy consumption:

Policies should be taken to reduce the energy consumption.

According ^{to} Green Transport project, Pakistan aims to convert 30% of all cars and 50% of motorcycles to electric-powered.

Biomass energy should be introduced:

Energy, which is abstracted from wood and crop residues, will minimize the economic cost and reduce the climate change.

Measures should be taken to geothermal energy:

Geothermal energy is produced from underground hot water and steam resources.

It will guarantee the sustainable consumption of energy.

Anti-Oxidants

Formation of free radicals:

Cells contain both positive and negative charges. When cells exposed to oxygen, oxidation occurs. These cells gain oxygen and loses Hydrogen electron so, charged particles left without pairs, these are known as free radicals.

Oxidation thus caused.

- Damage to nerve cell in brain
- Deterioration of eye lens
- Arthritis
- Heart disease
- Acceleration of aging process

Anti-oxidants fight against these free radicals:

Free radicals caused because of cigarette smoke, sun, drinking alcohol and large amounts of heavy metals. To minimize their effects anti-oxidants are taken.

Anti-oxidants ^{are present in} include vitamin E, C, A, Zinc, Iron, selenium.

How do anti-oxidants work:

Anti-oxidants donate electron to free radicals. These free radicals are converted into pairs which neutralize their harmful reaction.

Examples of anti-oxidants

Butylated Hydroxy Anisole

Butylated Hydroxy Toluene

Propyl Gallate

Anti-oxidants are present in several food:

Foods which contain vitamins and minerals are rich in anti-oxidants. For example, grapes, blue-berrries, green vegetables and nuts.

Difference between Eukaryotic and Prokaryotic cells

Eukaryotes and prokaryotes are similar in cell membrane, cytoplasm, and DNA and ribosomes. However, there are several difference between eukaryotic and prokaryotic cells.

Prokaryotes

Eukaryotes

- | | |
|---|--|
| <ul style="list-style-type: none">• Prokaryotes has no nucleus. | <ul style="list-style-type: none">• Eukaryotes have nucleus. |
| <ul style="list-style-type: none">• Prokaryotes have no membrane-bound organelles. | <ul style="list-style-type: none">• Eukaryotes have membrane bound organelles. |
| <ul style="list-style-type: none">• Prokaryotes are smaller and simpler. | <ul style="list-style-type: none">• Eukaryotes are larger and complex. |
| <ul style="list-style-type: none">• In prokaryotes, DNA is floating freely around the cell. | <ul style="list-style-type: none">• In eukaryotes, DNA helds within its nucleus. |
| <ul style="list-style-type: none">• They divide by binary fission. | <ul style="list-style-type: none">• They undergo mitosis. |
| <ul style="list-style-type: none">• Example: Bacteria | <ul style="list-style-type: none">• Example: animals, plants, fungi. |

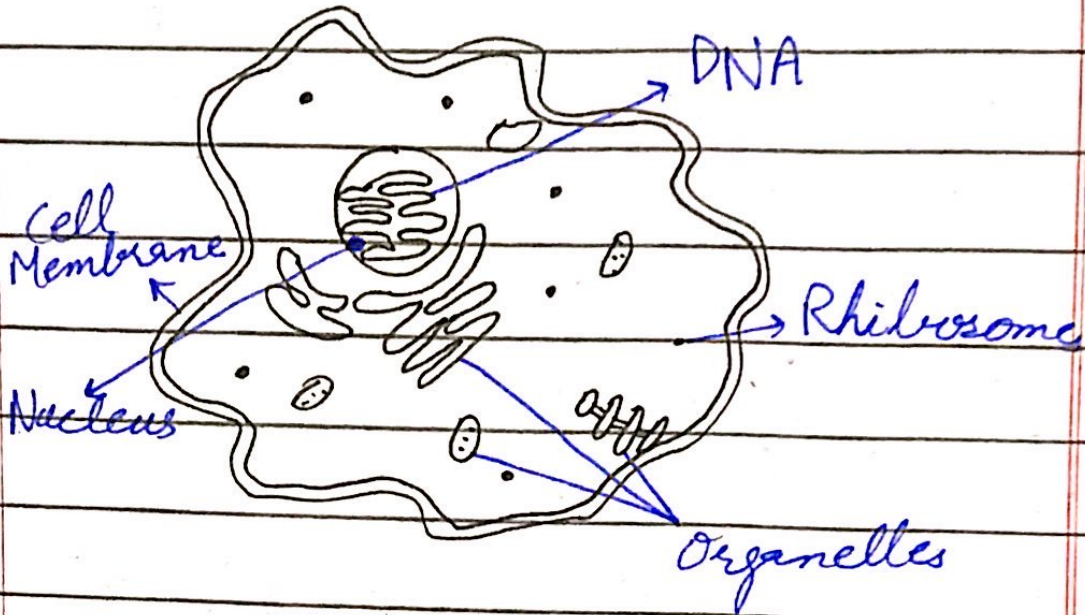


Figure: Eukaryotic cells

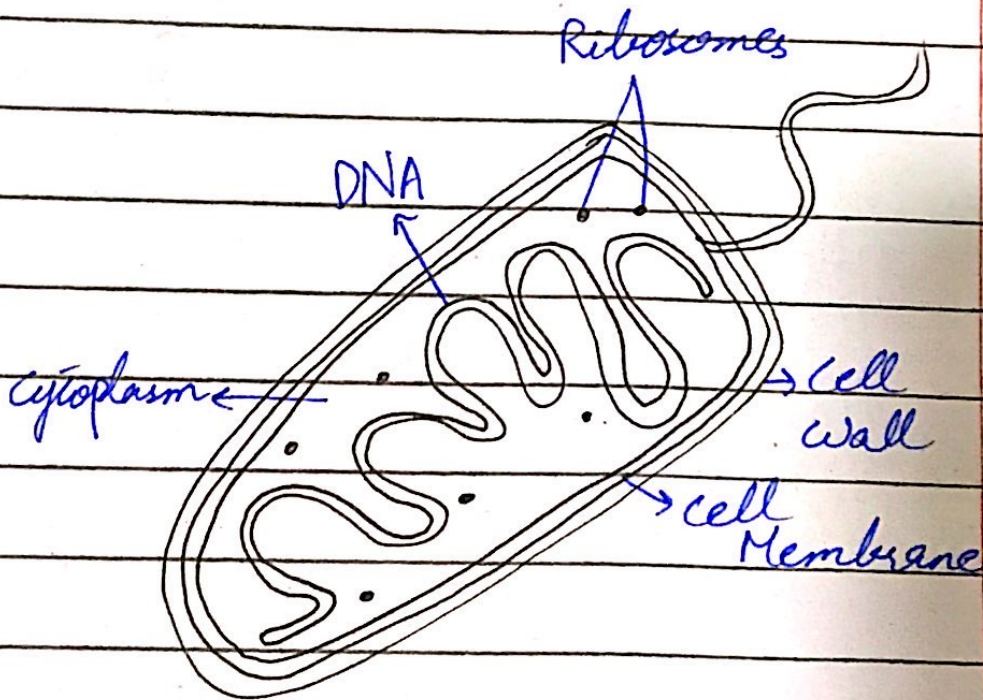


Figure: Prokaryotic cells