1. SENSATIONS AND RESPONSES

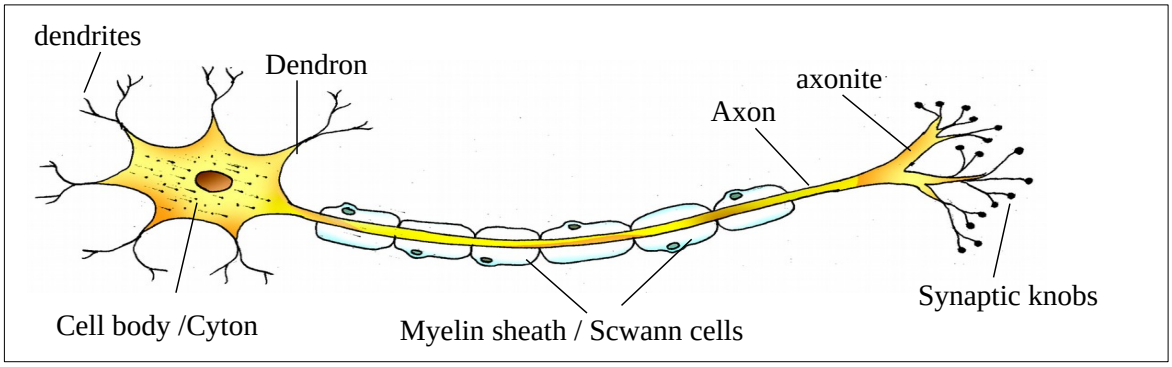
For **SSLC 2022**

Class 10 Biology - **Focus Area covered Notes**
റഷീദ് ഓടക്കൽ GVHSS Kondotty 9846626323

Chapter 1 video link : https://youtu.be/Crzs2t3r7Hs

1. Name the parts included in our nervous system.
Brain, spinal cord, nerves and receptors.

2. The structural and functional units of the nervous system ? Neurons (nerve cells).



A neuron has mainly the following parts; a **cyton** (cell body), impulse receiving **dendron**s (branches are known as dendrites), impulse transmitting **axon** (branches are axonites) and **synaptic knob**s for secreting neurotransmitter. In certain neurons, the nerve fibres are covered by **myelin sheath**, made up of white shining Schwann cells.

3. The protective covering of nerve fibres (axons) ? Mention its function.
Myelin sheath.

* Provide nutrients and oxygen to the axon.
* Accelerate impulses.
* Act as an electric insulator.
* Protects the axon from external shocks.
* Gives white appearance ('white matter') to the neural parts.

4. Table showing the function of different parts of nerve cell.

Dendrite	Receives impulses
Dendron	Carries impulses from dendrite to the cell body
Cyton / Cellbody	Passes impulses to the axon.
Axon	Carries impulses from the cell body to outside.
Axonite	Carries impulses to the synaptic knob
Synaptic knob	Secretes neurotransmitter

5. Name the swollen ends of axon . How is it important in the transmission of impulse ?
Synaptic knobs, from which neurotransmitter secretes. (When impulses reach at the synaptic knobs, a chemical substance, known as neurotransmitter, released in the synaptic cleft. This chemical stimulates the adjacent dendrites to form new electric impulses.)

6. Give example for neurotransmitter.
Acetyl choline (Dopamine is another example).

7. How is the impulse (the electrical message conducted through nerves) transmits ?

Impulse due to stimulus → dendrites → dendrons → cyton → axon → axonites → synaptic knob → secretion of neurotransmitter to the synaptic cleft → Stimulation in the adjacent dendrites → Impulse forms.

8. Name the two types of neurons ?
Sensory neurons – (carry impulses from different body parts to the brain and spinal cord)
Motor neurons - (carry impulses from the brain and spinal cord to various parts of body)

9. Define a nerve ?
A nerve is a group of axons or nerve fibres, covered by connective tissue.

10. Show different kinds of nerves with their functions in a table.

Sensory nerves (consists of sensory neurons)	Carry impulses from sense organs to the brain and spinal cord
Motor nerves (consists of motor neurons)	Carry impulses from brain and spinal cord to different organs
Mixed nerves (consists of sensory and motor neurons)	Carry impulses from brain and spinal cord to different organs and vise versa

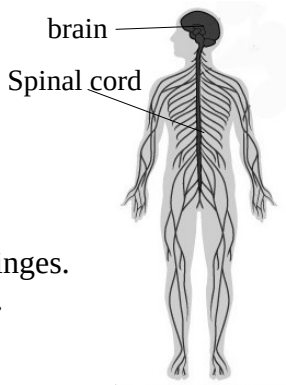
11. How is human nervous system classified ?

Central Nervous System

- Brain
- Spinal cord

Peripheral Nervous System

- Cranial nerves (12 pairs)
- Spinal nerves (31 pairs)



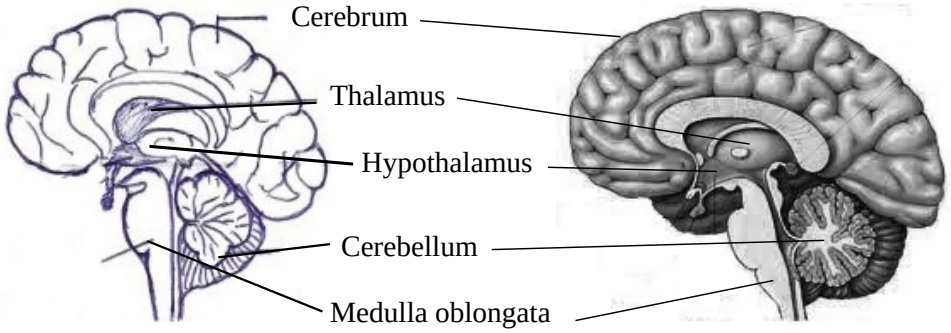
12. The protective measures for human brain ?
Inside a hard skull and is covered by a three layered membrane, called the meninges. Cerebrospinal fluid, a fluid formed inside the meninges, also protects the brain.

13. The outer covering of brain and spinal cord ? Ans: Meninges.

14. The fluid which provides nutrients and oxygen to brain tissues ? Give its function ?
Cerebrospinal fluid (CSF).

- CSF provides nutrients and oxygen to brain tissues.
- Regulates the pressure inside the brain.
- Protects brain from injuries.

15. Name the functional parts of human brain.
Human brain has outer cerebrum, cerebellum and medulla oblongata and inner thalamus and hypothalamus.



16. Table showing different parts of brain, peculiar feature and functions of each.

Part of brain	Features	Function
Cerebrum	The largest part of the brain with many fissures and folds in its cortex. Cerebral cortex is seen as grey matter and inner medulla as white matter.	-Centre of thought, imagination, intelligence and memory. -Centre of feeling senses. -Controls voluntary movements.
Cerebellum	The second largest part, seen as two flaps.	Coordinates muscular activities and maintains equilibrium of the body.
Medulla oblongata	The rod shaped lower part	Controls involuntary actions like heart beat and breathing.
Thalamus	The seat of cerebrum	Acts as relay station of impulses to and fro the cerebrum and also analyses the impulses.
Hypothalamus	Seen just below the thalamus	Plays a major role in the maintenance of homeostasis.

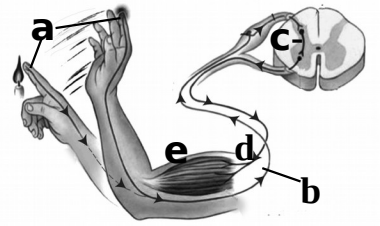
17. There are many fissures and folds in the cerebral cortex (the peripheral part of brain). What is the advantage of this ?
This is an adaptation to include more number of neurons and there by increase the efficiency of cerebrum.

18. Any mild injury to the medulla oblongata may lead to sudden death. Why ?
Medulla oblongata controls involuntary actions like heart beat and breathing. Any mild injury to medulla oblongata results malfunctioning of breathing and heartbeat and this may lead to death.

19. The central nerve, seen as the continuation of medulla oblongata ? How is this part protected ?
Spinal cord. It is protected inside the vertebral column and is covered by the meninges.

20. Define **Reflex action**.
Reflex action is the accidental and involuntary responses of the body, in response to a stimulus. 2 types,
a. Cerebral reflexes (Eg:-Blinking of eyes, sudden fright when hearing a loud noise or seeing a snake, sneezing)
b. Spinal reflexes (Eg :- On touching hot object, the hand is withdrawn, withdrawal of the leg when a spine pierce in to the feet)

21. Define **Reflex arc**: Reflex arc is the pathway of impulses in a reflex action. This includes,
a. stimulus receiving receptor
b. sensory neuron c. inter neuron
d. motor neuron e. effecting muscles.



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22. The table showing neural disorders, reason and symptoms.

Disorder	Cause	Symptom
Alzheimer's	Continuous degeneration of neurons due to the accumulation of an insoluble protein.	Complete loss of memory.
Parkinsons	Degeneration of specific ganglia in the brain due to the deficiency of **dopamine**	Loss of body balance. Tremor in muscles, flow of saliva
Epilepsy	Discharge of irregular electrical impulses from brain.	Fits (due to uncontrolled muscular contractions), frothy discharge from mouth, clenching of teeth, unconsciousness

23. Name a neurotransmitter, which is secreted in the brain. What will happen when the production of this hormone cease in a person ?
Dopamine. The deficiency of dopamine may result a disease called parkinsons.

2. WINDOWS OF KNOWLEDGE

For **SSLC 2022**

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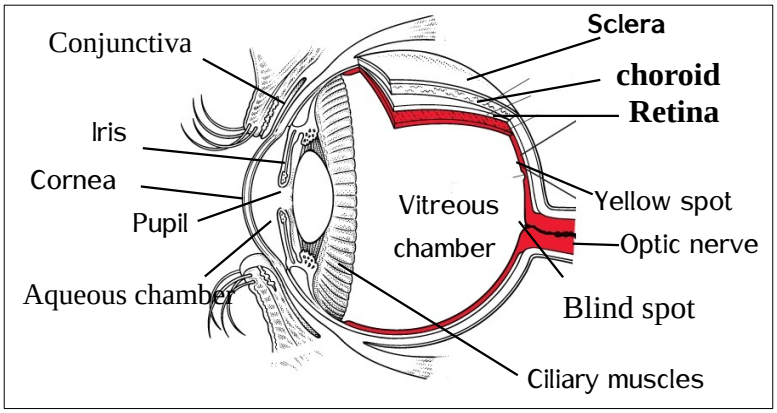
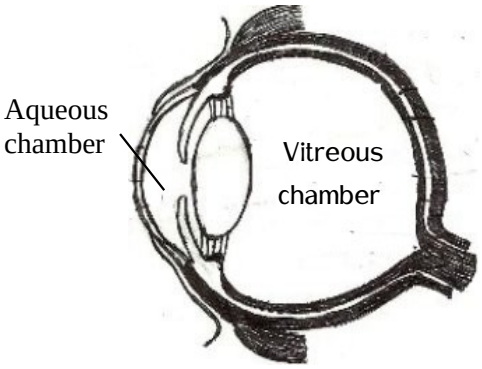
Chapter 2 video link : https://youtu.be/AHheE-usSwA

1. How are our eyes protected?
- Bony eye socket (orbit) - External eye muscles - Eyelids - Eyelashes -- Eyebrow
- Tears with lysozyme, an enzyme which destroys germs) and - Conjunctiva .

2. Which are the 3 layers of human eye ?
a. **Sclera** –The outermost, strong layer, that gives shape. Its transparent anterior portion is the **cornea**.
b.**Choroid**- Middle layer of blood capillaries, which supply nutrients and oxygen.
Its anterior dark screen with pupil is the **iris**. A convex lens is placed behind the iris.
c. **Retina-** The innermost layer on which, the image forms. The optic nerve starts from the retina.

3. The fluids filled in the chambers of eye , position and function ?
* **Aqueous humor** – A watery fluid seen in the aqueous chamber [between cornea and lens] , oozes from the blood. This fluid supplies nutrients and oxygen to cornea and lens.
* **Vitreous humor** - A jelly like fluid filled with in the vitreous chamber [between lens and retina], helps to maintain the shape of eyeball.





4. Slightly projected transparent anterior part of the sclera ? Ans: Cornea.

5. The transparent membrane which protects the sclera, except the cornea ? Ans: Conjunctiva.

6. The dark coloured anterior part of choroid is --------, which contains the pigment melanin. Ans: Iris.

7. The aperture at the centre of iris ? Ans: Pupil.

8. The antagonistic muscles in the iris that regulate the size of eye pupil ?
Radial muscles (pupillary dilator) and Circular muscles (pupillary constrictor).

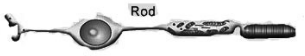
9. When bright light falls, the eye pupil --------- ?
- Constricts [due to the contraction of the circular muscles]

10. The muscles, which adjust the curvature of eye lens, seen behind the iris ?
Ciliary muscles.

11. Compare and contrast between the **photoreceptors** seen on the retina.

Photoreceptor	Containing pigment	Function	Related disorder
Rod cells	Rhodopsin	Vision under dim light	Night blindness
Cone cells	Photopsin / Iodopsin	Vision under intense light	Colour blindness

Receptor region of the rod cells is rod shaped and contain the pigment rhodopsin, which will be stimulated under dim light. Receptor region of the cone cells is cone shaped and contain the pigment photopsin (iodopsin) which will be stimulated under intense light.



Under dim light, rhodopsin dissociates to form retinal and opsin to produce impulses from rod cells.Under intense light, photopsin(iodopsin) dissociates to form retinal and opsin to produce impulses from cone cells. The red, green & blue types of cone cells provide us with colour vision.

12. Vitamin A help us for better vision. Give reason.
Retinal, the visual pigment found in the photoreceptors, is formed from vitamin A.

13. Compare between Blind spot and Yellow spot.
Blind spot is a part of retina from where the optic nerve begins. No photoreceptors at this spot, hence no vision. **Yellow spot** is the point of highest vision in the retina, where more cone cells seen. Images form in and around the yellow spot.

14. Point on retina lacking vision : Blind spot ;
Point of highest vision in retina : --------- ? Ans: Yellow spot.

15. What are the changes occur in retina when images focus on it ? (Describe that how vision is possible.)

When light rays from the object fall on the lens, a small, real inverted image forms on the retina. When the image is formed under dim light, rhodopsin in the rod cells dissociate to produce impulses and when the image is formed under intense light, photopsin in the cone cells dissociate to produce impulses. These impulses are transmitted through the optic nerve.
The brain coordinates the images from both eyes (*binocular vision*) to feel perfect vision.

16. Experience of vision - Flowchart.

Light rays from the object → Cornea → Aqueous humor → Pupil → Lens → Vitreous humor → Image forms on retina → Stimulation in the photo receptors → Dissociation of rhodopsin / photopsin → Impulses → Optic nerve → Coordination of images by cerebrum → Perfect vision.

17.Table which shows reason of various disorders and diseases that affect on our eyes.

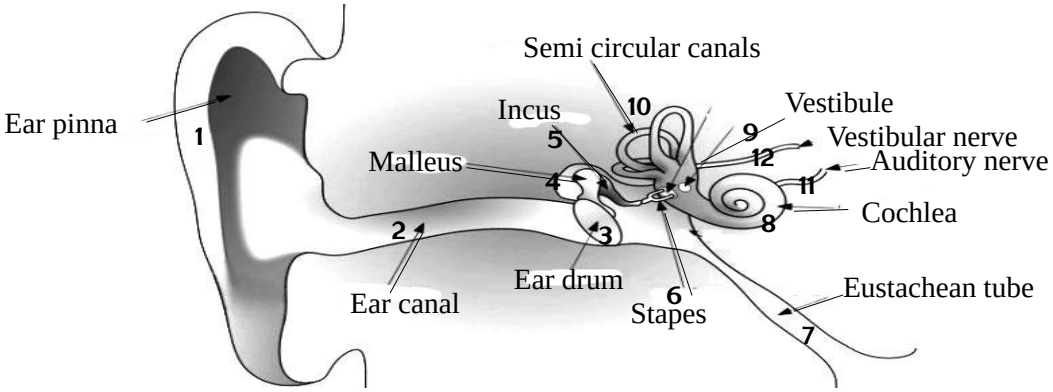
Disorder/Disease	Reason or Symptom	Remedy
Night blindness	Due to the deficiency of vitamin A, no clear vision in dim light.	Vitamin A
Colour blindness	Due to the defect cone cells which detect red and green colours and fails to detect those colours	-
Xerophthalmia	Prolonged deficiency of vitamin A results dry conjunctiva and cornea	Vitamin A

18. The condition by which certain colours cannot recognize : Colour blindness ;
Decreased vision in dim light : ---------- ? Ans: Night blindness.

19 .---------- and ---------- are the two conditions of eye due to the deficiency of vitamin A.
Night blindness and Xerophthalmia (dry conjunctiva and cornea).

20. The functions of human ear ? Ans: Hearing, body balance.

21. The main parts of human ear ? Functions ?



External Ear
1. Ear pinna
2. Auditory canal
3. Ear drum / Tympanum

Middle Ear
4. Malleus
5. Incus
6. Stapes
(Ear ossicles)
7. Eustachian tube

Internal Ear
8. Cochlea
9. Vestibule
10. Semicircular canal
11. Auditory nerve
12. Vestibular nerve

Pinna	Carries sound waves to them auditory canal.
Auditory canal	Carries sound waves to the tympanum
Tympanum	Separates the middle ear from the external ear. It vibrates in resonance with sound waves
Ear ossicles (malleus, incus,stapes)	Amplify and transmit the vibrations of the tympanum to the internal ear.
Eustachian tube	Connects the middle ear and the pharynx. Protects the tympanum by balancing the pressure on either side of the tympanum.
Oval window	Spreads the vibration of ear ossicles to the inner ear.
Round window	Helps in the movement of fluid inside the cochlea.
Cochlea	Functions in hearing. It contains the cluster of auditory receptors (hair cells) and fluids (endolymph & perilymph).
Auditory nerve	Carries impulse from cochlea to the centre of hearing in brain (cerebrum).
Vestibular apparatus	(vestibule and the 3 semicircular canals) Functions in body balancing.
Vestibular nerve	Carries impulse from vestibular apparatus to brain (cerebellum).

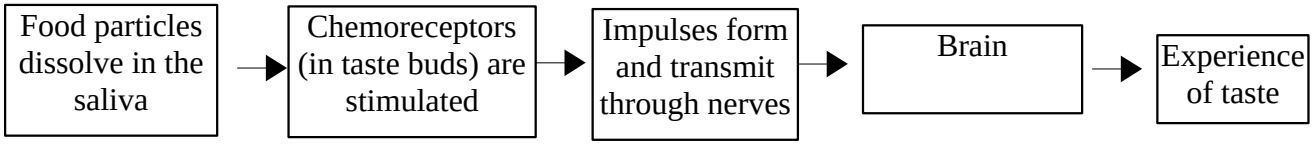
22. When sound waves enter to the ear, ... starts to vibrate. Ans: Ear drum (tympanum)

23. Name the bones of ear ossicles. Ans: Malleus, Incus, Stapes. (stapes is the smallest bone)

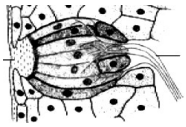
24. The tube that connects the middle ear to the pharynx ? What is its function ?
Eustachian tube. It helps to regulate the pressure inside the middle ear.

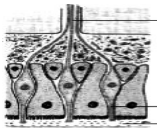
25. The different taste buds of the tongue.
Sweet, salt, sour, bitter, Umami. Other tastes are created by the brain from the primary tastes.

26. The flowchart of sensing taste.



27. Recognize the figure A and B.

 A

 B

Ans: A. Taste bud with chemoreceptors B. Olfactory receptors.

28. How can we feel smell ?
When particles enter to the nose and disperse in the mucus, the olfactory receptors in the mucus membrane get stimulate and the impulses reach the brain through the olfactory nerve. Brain helps to feel the sense of smell.

29. The ability of shark to sense smell is sharp. Why?
Shark has highly sensitive olfactory receptors.

3. CHEMICAL MESSAGES FOR HOMEOSTASIS

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Chapter 3 video link : https://youtu.be/8CiEnU-EA8E

1. The chemical substances, secreted by the endocrine glands ?
⟶ **Hormones**.
The hormones secreted by these 'ductless glands' are discharged directly in to blood, and each hormone act at its own target cells, having specific receptors for accepting the same hormone.

2. The table showing various endocrine glands and their hormones.

*__Hypothalamus__ -Releasing hormones.-Inhibitory hormones, Oxytosin, Vasopressin(ADH).
Pituitary - Tropic hormones (TSH, ACTH, GTH), Somatotropin (STH/Growth hormone), Prolactin.
Pineal - Melatonin.
Thyroid - Thyroxine. Calcitonin.
Parathyroid - Parathormone.
Thymus - Thymosine.
Adrenal - Cortisol, Aldosteron, Sex hormones, Epinephrine (Adrenalin), Norepinephrine (Noradrenalin).
Pancreas - Insulin, Glucagon.
Gonads - Estrogen, Progesterone (by ovaries), Testosterone (by testes)

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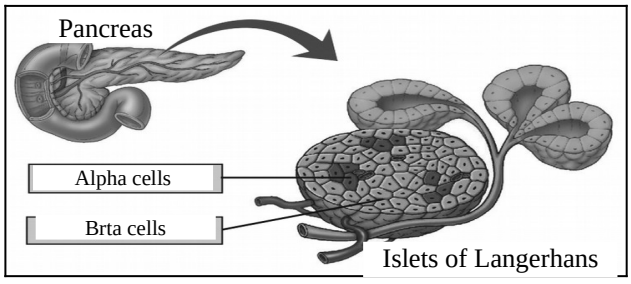
3. What is the normal level of glucose in blood ?
Name the hormones which maintain this rate ?
70 – 110 mg /100 ml blood.
Insulin, Glucagon.



4. How is the normal blood glucose level maintained?
This rate is maintained by the antagonistic activities of insulin and glucagon, released from Islets of Langerhans of the pancreas.
When glucose increases in blood, beta cells in the Islets of Langerhans secretes **insulin**. It accelerates the process of glucose intake by the cells and conversion of the excess glucose in to glycogen.
When glucose decreases in blood, alpha cells in the Islets of Langerhans secretes **glucagon**, which converts glycogen and amino acids in to glucose.

5. Islets of Langerhans : Alpha cells : Glucagon ;
Islets of Langerhans : Beta cells : ….....? Ans: Insulin.

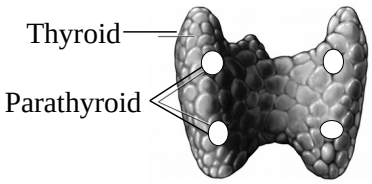
6. Diabetes mellitus /പ്രമേഹം ?

Nov 14:
World Diabetes Day

The blood glucose level more than 126mg/100ml in FBS test.
Reason: Either the deficiency or the inactivity of insulin hormone.
Symptoms: Increased appetite and thirst and frequent urination)

7. A test to detect the presence of glucose in urine ?
Benedict Test. (Add 2 ml Benedicts solution to 2 ml urine and heat mildly, observe the colour change)

8. Patients having diabetes mellitus usually takes insulin injection. Why ?
Insulin maintains the normal rate of glucose in our blood.



9. Name the endocrine glands that maintain the normal level of calcium ?
Thyroid and parathyroid.

10. The hormones which maintain the normal rate of calcium in our blood ?
Calcitonin of thyroid gland, Parathormone of parathyroid gland.

11. What is the normal level of calcium in blood ? How is it maintained ?
9-11 mg /100 ml blood.

When the level of calcium in blood increases, thyroid gland secretes **calcitonin**, which lowers the level of calcium in blood, by depositing excess calcium in bones or by preventing the mixing of calcium with blood (from the bones).

When the level of calcium decreases , parathyroid gland secretes **parathormone**, which increases the level of calcium by helping in its re-absorption from kidneys or by preventing the deposition of calcium in bones.

12. Name the growth disorders related to the growth hormone (somatotropin / STH) of the pituitary.

Dwarfism - The condition characterised by stunted physical growth due to decreased production.
Gigantism – Excessive growth of the body due to increased production of Somato Tropic Hormone.
Acromegaly – Excessive growth of the bones on face, jaws and fingers due to the prolonged production of STH even after the growth phase.

13. Mention the symptoms of acromegaly.
Excessive physical growth with excessive growth of the bones on face, jaws and fingers.


acromegaly


gigantism

dwarfism

14. Hormonal disorders:

Dwarfism	Stunted growth of bones due to under secretion of somatotropin in children.
Gigantism	Growing tall and heavy due to over secretion of somatotropin in children.
Acromegaly	Excessive growth of the bones on face, jaws and fingers due to the prolonged production of somatotropin even after the growth phase.
Diabetes mellitus	The condition of excessive loss of glucose through urine due to deficiency or inactivity of insulin.

15. Define pheromones. How is it useful to animals ?

Pheromones are chemical substances that are secreted by certain animals to the surroundings to facilitate communication.

It help in attracting mates, informing about food, determining the path of travel, signalling dangers, help honey bees and termites to live in colonies etc.

16. Give examples of pheromones

The **musk** in the musk deer,
The **civeton** in civet cat ,
Bombycol in female silkworm .

17. Ants can follow one after another during their trail. How is this possible ?
Because of the chemicals, *pheromones*, that released to their surroundings.

18. How are pheromones helpful in agricultural fields ?
Pheromone traps are used for pest control in agricultural fields.
19. How the life activities are controlled and coordinated in plants ?
Certain plant hormones (plant growth regulators) control and coordinate life activities in plants.

20. Table showing the natural plant hormones and their activities.

Plant hormones	Activities
Auxin	Cell growth, cell elongation, promoting terminal buds growth, fruit formation.
Cytokinin	Cell growth, cell division, cell differentiation.
Gibberellin	Stimulates break down of stored food to facilitate germination, sprouting of leaves
Ethylene	Ripening of leaves and fruits, excess amount causes dropping of leaves and fruits.
Abscisic acid	Dormancy of embryo, dropping of ripened leaves and fruits.

21. Name the plant hormone in gaseous form. Ans: Ethylene.
22. The uses of artificial or synthetic plant hormones in agricultural sector.
Used for flowering, ripening and harvesting fruits at the same time, to increase fruit size, for the sprouting of roots etc.

4. KEEPING DISEASES AWAY

Class 10 Biology - **Focus Area covered Notes**
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1. **Chapter 4 video link**: https://youtu.be/ATMx2PyPVKQ

Causing micro organisms (pathogens/germs)	Examples of Diseases
* Bacteria * Viruses * Fungi * Protozoa	- Tuberculosis, Ratfever, Diphtheria. - AIDS, Nipah, Covid 19, Hepatitis. - Athletes foot, Ringworm. - Malaria.

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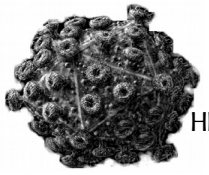
2. An air borne bacterial disease that affects mainly the lungs ? Name the pathogen.
Tuberculosis. Pathogen is Mycobacterium tuberculosis. (spread through air).

3. Common symptoms of tuberculosis ?
Loss of body weight, fatigue and persistent cough.
4. The vaccine, ----------, is used against tuberculosis. Ans: **BCG** vaccine.
5. Medicine for tuberculosis ? Ans: Antibiotics.
6. Define AIDS ?
AIDS (Acquired Immuno Deficiency Syndrome) is a condition of a gradual decrease of immunity by the destruction of lymphocytes by **HIV** (Human Immunodeficiency Virus).
Any pathogen can act in such condition, is a dreadful situation.
7. What are the ways by which HIV spreads ?


HIV

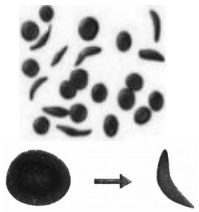
- Through body fluids.
- By sharing needle and syringe used by HIV affected persons.
- Through unprotected sexual contact.
- From HIV infected mother to her foetus.

8. What are the precautions that can be taken against the infection of HIV ?
- Conduct HIV test before receiving blood from a donor.
- Do not share needle and syringe already used by others. - Have safety in sexual relationship.

9. The organisms that cause **malaria** ? How is it spread ?
The protozoan, 'plasmodium'. Spread through anopheles mosquitoes.
10. Symptoms of malaria ?
High fever with shivering and profuse sweating are major symptoms.
Also headache, vomiting, diarrhoea, anaemia ..

11. Bacteria : Prokaryotes,
Protozoa : ---------- ? (Eukaryotes).

12. Examples for genetic disease ?
Haemophilia (blood does not clot) and sickle cell anaemia.



13. What is **haemophilia** ? Mention its symptoms.
Due to the defect of genes, deformities occur in the sequencing of amino acids of haemoglobin, and RBCs become sickle shaped. Oxygen carrying capacity of red blood cells decreases. Such patients will be anaemic and weaken.

14. Tired or weak due to iron deficiency : Anaemia,
Tired or weak due to genetic defect : ---------- ? Ans: sickle cell anaemia

15. Define **cancer**. Reason and mode of treatment ?
The condition by which uncontrolled division of cells and their spread to other tissues occur.
Reasons :- Environmental factors, smoking, radiations, viruses, hereditary factors and alterations in genetic material may lead to the transformation of normal cells in to cancer cells.
Treatment :- Surgery, Chemotherapy, radiation therapy.
Early diagnosis of cancer is important in the treatment.

16. A few diseases affect the domestic animals:

Foot and mouth disease (കുളമ്പുരോഗം)	Virus
Anthrax, Inflammation of udder (അകിടുവീക്കം)	Bacteria

17. List out diseases that are common in plants. Name the category of pathogen of each.

Blight disease of paddy, Wilt disease of brinjal	-Bacteria
Mosaic disease in peas and tapioca, Bunchy top of banana	- Virus
Quick wilt in pepper, Bud rot of coconut	- Fungus

5. SOLDIERS OF DEFENSE

Class 10 Biology - **Focus Area covered Notes**
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1. Defense mechanisms in our body ? **Chapter 5 video link** : https://youtu.be/gkcdpUx6HWg
-Body coverings (Skin and mucous membrane)
-Body secretions (Mucus, saliva, tears, urine, sweat, sebum, ear wax, HCl …)
-Body fluids (Blood and lymph)

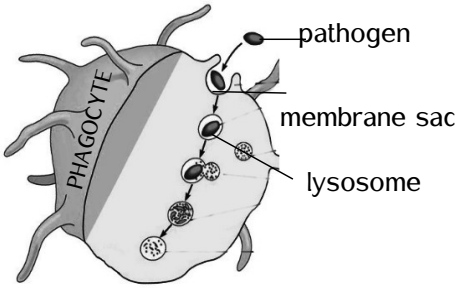
2. 'Our skin is referred as a fort of defense'. How?
The outer epidermis of the skin have a protein called **keratin**, prevents germs from entering it.
Sebum, produced by the sebaceous glands makes skin oily and water proof.
Sweat, produced by the sweat glands have disinfectants to destroy germs.
Skin also contain useful bacteria, which indirectly prevent germs.

3. Various secretions to defend pathogens in different body parts.

Body part	Body secretion	Body part	Body secretion
Eye	- Tears with lysozyme.	Ear	-Ear wax
Nose, Trachea	- Mucus.	Mouth	-Saliva with lysozyme.
Stomach	- HCl in the gastric juice.	Intestines	- Mucus.

4. The main warriors of the body ?
White blood cells (Monocytes, Basophils, Neutrophils, Eosinophils and Lymphocytes)
The real warriors are the lymphocytes. [B-lymphocytes produce antibodies against pathogens)

5. Define the defense mechanism, phagocytosis ?
Phagocytosis is the process of engulfing and destroying germs by certain white blood cells, (called the *phagocytes*).
Process:- -Phagocyte reach near the pathogen.
-Engulfs the pathogen in the membrane sac.
-Membrane sac combines with lysosome.
-The enzyme in the lysosome destroys the pathogen.
-Phagocyte expels the remnants.



6. Give examples for phagocytes. Ans: Monocytes and neutrophils.

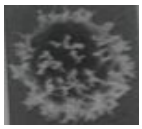
7. What is specific defense ?

The defense mechanism that identifies the structure of each antigen and destroys it specifically is called specific defense. Lymphocytes destroys pathogens specifically.

[**Antigens** are foreign bodies or pathogens that enter the body and stimulate the defense mechanism]

8. B-lymphocytes : Mature in the bone marrow;

T-lymphocytes : ---------- ? Ans: Mature in the thymus gland.



9. Name the chemical substances, produced by B-lymphocytes against foreign bodies(antigens).

How these substances destroy germs ?

Antibodies. B-lymphocytes destroy germs by disintegrating tbacterial cell membrane, neutralise their toxins, and stimulate the other white blood cells.

10. How is T-lymphocytes destroy germs ?

T-lymphocytes stimulate the other white blood cells and also destroy cancer cells as well as virus affected cells.

11. Define **vaccines** ?

Vaccines are substances,given in advance to prevent certain diseases.

Dead, inactive, alive but neutralized germs or toxins are used as vaccines.

12. Who started **immunization** ?

Doctor Edward Jenner. [Smallpox vaccine , the first vaccine, was invented by him]

[The immunization programmes got the name vaccination from the Latin word '*vacca*' meaning cow, in memory of the cowpox experiments of Jenner.]

13. How do vaccines induce immunity ?

By the presence of the antigens (vaccines), lymphocytes become activated and produce antibodies. These antibodies remain in the body for long time to provide immunity against such antigens.

Vaccine	Against which Disease
BCG	Tuberculosis
OPV	Polio
Pentavalent	Diphtheria, Pertussis, Tetanus Hepatitis-b, Hib
MMR	Mumps, Measles, Rubella
TT	Tetanus

BCG= Bacillus Calmette-Guerin
OPV= Oral polio vaccine
Hib= Haemophilus influenza -type b
TT= Tetanus toxoid

14. Define: * Antigen * Antibody * Antibiotics

Any foreign body that stimulates the defense system is called as an antigen.

Antibodies are chemical substances, produced by the B lymphocytes against antigens.

Antibiotics are medicines that are extracted from microorganisms like bacteria, fungi, etc. and used to destroy bacteria.

15. The first antibiotics (penicillin)was synthesized by ---------- ?

Alexander Fleming (in 1928 from a fungus, *penicillium notatum.*)

16. Though antibiotics are useful medicine, its use should be with great care. Why ?

(**Side-effects** of antibiotics ?)

- Regular use develops immunity in pathogens against antibiotics.
- Destroy useful bacteria in the body.
- Reduces the quantity of certain vitamins in the body.

17. What is **blood transfusion** ? Give example for instances that need blood transfusion.

Blood transfusion is the transfer of blood from one person to other. It can be done in the situations like heavy loss of blood in accidents, surgical operations and in the treatment of blood cancer.

18. What all things should be taken care of while transfusing blood?

Healthy people in the age 18-60 can donate blood, once in 3 months.

Pregnant and breast feeding women as well as person with communicable disease should not donate blood.

Prior to blood transfusion, blood group testing is necessary.

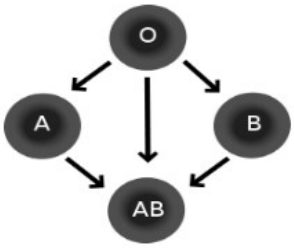
19. Name the major blood groups.
A, B, AB, O
[Carl Landsteiner proposed blood grouping on the basis of A, B antigens seen on the surface of RBC]

20. On what basis, blood groups are called as positive or negative ?
Those blood with Rh factor (antigen D) on the surface of RBC are termed as positive group blood and those with out Rh are termed as negative group blood.

21. Why is that not possible to receive blood from all persons ?
If blood is not compatible, the antigen in the received blood will react with the antibody in the recipient's blood of so as to clot RBC (agglutination).

22. Table showing different blood groups, antigen, possible antibody and group that can receive the blood.

Blood Gr	Antigen present	Antibody	Whom can receive each
A	A	Anti-b	A, AB
B	B	Anti-a	B, AB
AB	A, B	--	AB
O	--	Anti-a, Anti-b	A, B, AB, O



23. Prepare apt slogans to encourage blood donation.
Blood donation is life donation.
You can save a valuable life, through donating your blood.
Donating blood is not harmful to our health, instead, it is a noble deed.

6. UNRAVELLING GENETIC MYSTERIES

Class 10 Biology - **Focus Area covered Notes**
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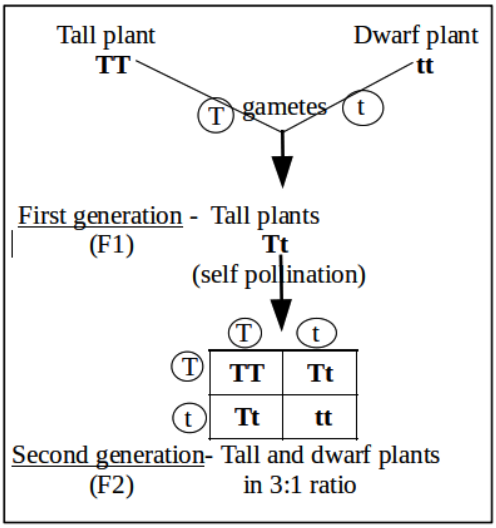
Chapter 6 video link : https://youtu.be/lah9Cq1Nxg8

For **SSLC 2022**

1. What is genetics (Hereditary science) ?
Genetics is the branch of science that deals with heredity and variations.
- **Heredity** is the transmission of characters from parents to their offsprings.
- **Variations** are the features seen in offsprings that are different from their parents.

2. Who is known as 'the Father of Genetics' ? Why is he known as so ?
Gregor Johann Mendel.
The inferences from his hybridization experiments in pea plants led the foundation of genetics.

3. Considering one pair of contrasting traits (tallness-dwarfness) in garden pea plants, Mendel got plants in 3:1 ratio in the second (F2) generation:



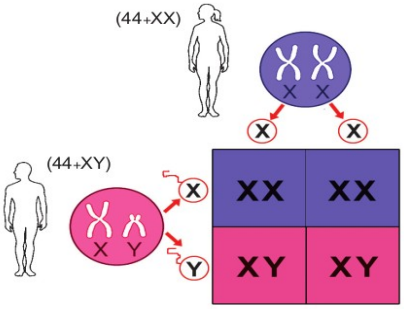
The main inferences of Gregor Mendel:
- A trait is controlled by the combination of two factors.
- One trait is expressed (dominant trait) and the other remains hidden (recessive trait) in F1 generation.
- The trait which remains hidden in the first generation appears in the second generation.
- The ratio of the dominant and recessive traits in the second generation is 3:1 .

4. The hereditary factors, first described by Gregor Mendel, are now known as ------ ? Ans: **Genes**.

5. What are '**genes**' ?
Genes are parts of DNA that control metabolic activities and responsible for specific characteristic feature.

6. Define the term '**allele**' ?
Alleles are the different forms of a gene that controls a trait.

7. How many chromosomes are seen in each cell of human being ?
46 chromosomes (23 pairs)
Out of which, 44 (22 pairs) are somatic chromosomes and 2 (one pair) are sex chromosomes.
[**44+XX** will be **female** and **44+XY** will be **male]**

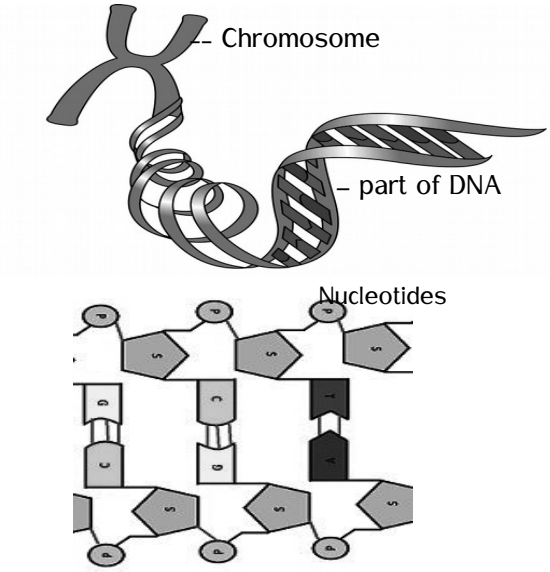


8. The two types of sex chromosomes ?
X and Y chromosomes.
[XY in males and XX in females]

9. Y chromosome of male gamete : Male child ;
X chromosome of male gamete : ---------- ?
Ans: Female child

10. Who proposed the double helical model of DNA ?
James Watson and Francis Crick (in1953)

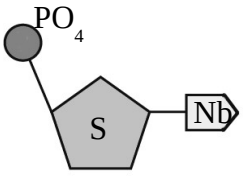

11. Explain the Watson-Crick model of **DNA**.



Chromosome contains DNA and it is made up of several nucleotides. DNA is a double helical structured molecule. The two long strands of DNA contain deoxyribose sugar and phosphate groups, and its steps are made of pairs of nitrogen bases. The nitrogen base, adenine pairs with thymine and the nitrogen base, cytosine pairs with guanine.

In other words, DNA molecule is made up of four kinds of nucleotides, namely adenine nucleotide, thymine nucleotide, cytosine nucleotide and guanine nucleotide.

12. Define a **nucleotide**.
Nucleotides are the basic units of nucleic acids, (DNA, RNA).
A nucleotide is made up of a sugar molecule, a phosphate group and a nitrogen base.



13. Molecules seen in the nucleic acids that contain nitrogen and are alkaline in nature ?
Nitrogen bases.

14. Adenine : Thymine;
Guanine : ---------- ? Ans: Cytosine.

15. Comparison between the two nucleic acids, DNA and RNA.

	DNA	**RNA**
Number of strand	2	1
Type of sugar	deoxyribose	ribose
Nitrogen bases	Adenine, **thymine**, cytosine, guanine	Adenine, **uracil**, cytosine, guanine

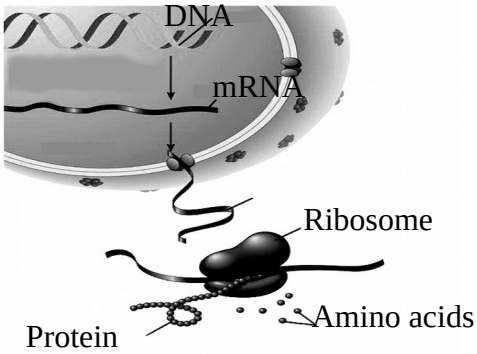
16. How do genes act ?
Genes, which are the specific parts of DNA, act through synthesizing proteins.
Different types of RNA involve in this process. Proteins are formed in the ribosomes.

17. Name different types of RNA.
mRNA (messenger RNA), **tRNA** (transfer RNA), **rRNA** (ribosomal RNA).

18. DNA unwinds and ---------- is synthesized which carries the information from DNA to the ribosomes.
mRNA.

19. The stages of protein synthesis of DNA (The action of genes) ?

- mRNA, which carries information, forms from DNA.
- mRNA reaches outside the nucleus.
- mRNA reaches ribosome.
- Based on the information, amino acids are transferred to ribosomes by the tRNA.
- Ribosomes bind amino acids to form protein molecule.



20. The cell organelles where protein synthesis occur ?
Ribosomes.

21. What are the reasons for variations in organisms ?
Fertilization, Crossing over and mutation.

7. GENETICS OF THE FUTURE

Class 10 Biology - **Focus Area covered Notes**
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Chapter 7 video link : https://youtu.be/M6DZjKdkcg4

1. What is genetic engineering ?
Genetic engineering is a technology that controls traits of organisms by bringing about desirable changes in their genetic constitution.

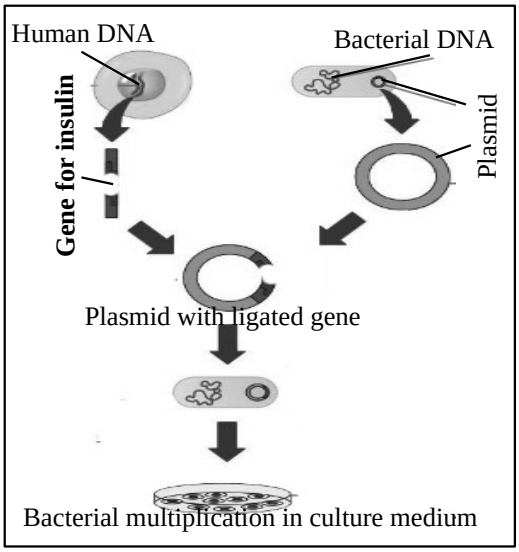
2. Mention how gene technology becomes beneficial ?
- Genetically modified organisms producing medicines, food items and other products.
- High productive and disease resistant varieties
- Remedy of genetic diseases through Gene therapy
- DNA finger printing/profiling (DNA test) to identify real person.

For **SSLC 2022**

3. How is it possible to bring about desirable changes in an organism ?
Genetic modification in organism is done by cutting or joining specific genes, using certain enzymes.
This process is known as genetic engineering.

4. Describe the stages in the production of human insulin bacteria through the process of genetic engineering.

a- From human DNA, cut the gene responsible for the production of insulin.
b- Plasmid (circular DNA) is isolated from a bacterium.
c- Human insulin gene is ligated with the isolated plasmid
d- Insert this ligated plasmid in to another bacterial cell.
e- This bacterium is allowed to multiply in a culture medium to produce inactive insulin.
f- Active insulin is produced from this.



5. Define '**vectors**' in genetic engineering.
Vectors are other DNA (usually bacterial DNA / plasmid), by which genes can be transferred from one cell to another.

6. What do you mean by genetic scissors and genetic glue that are used in the process of genetic engineering ?

The enzymes like Restriction endonuclease, used to cut DNA at specific sites, are generally called as '**genetic scissors**'. The enzymes like Ligase, used for joining DNA at specific sites, are generally called as '**genetic glue**'.

7. Genetic scissor : Restriction endonuclease,
Genetic glue : ---------- ?
Ans: Ligase

8. What is DNA profiling ?

The technology of testing the arrangement of nucleotides in the DNA of persons is called **DNA profiling** or **DNA finger printing** (DNA testing).

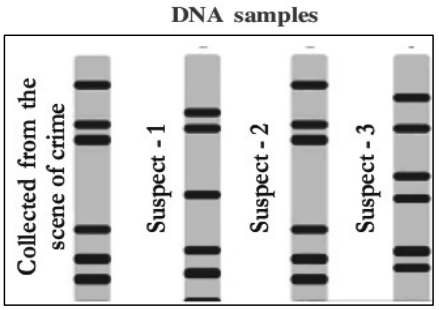
9. The developer of DNA finger printing ?
Alec Jeffreys

10. What is the basic principle behind this technology ?

The arrangement of nucleotides in the DNA of each person differs. In DNA profiling, we test the arrangement of nucleotides in the particular person with that of others.

11. Mention the scope of DNA testing.

-To find out hereditary characteristics,
-To identify real parents in the case of parental dispute
-To identify persons found after a long periods of missing due to war or natural calamities.
-To prove murder, robbery etc.



12. DNA profiling : For identifying person or other organisms,
---------- : For the treatment of genetic diseases.
Gene therapy.

13. Gene therapy ?

Gene therapy is a method of treatment in which the genes that are responsible for diseases are removed and normal functional genes are inserted in their place.

Gene therapy has triggered great hope in the control of genetic diseases.

8. THE PATHS TRAVERSED BY LIFE

Class 10 Biology - **Focus Area covered Notes**
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Chapter 8 video link : https://youtu.be/p_ND6dAsi8Y

For **SSLC 2022**

1. The hypotheses or theories that are related to the origin of life in earth ?

Theory of Chemical evolution and the Panspermia theory.

2. What were the ideas proposed by A.I. Oparin and J.B.S. Haldane on the origin of life on the earth ?
[Describe the theory of chemical evolution on the origin of life]

Theory of chemical evolution states that, life originated as a result of the changes that occurred in the chemical substances in seawater, under specific conditions in primitive earth, where free oxygen was absent.

3. The process of formation of primitive cell in primitive ocean. (Major events in the evolving of organic molecules) :

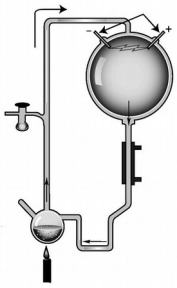
- Earth forms
- formation of primitive gases (eg:-methane, ammonia, H_2, nitrogen, CO_2, H_2S, water vapour.)
- condensation of water vapour to form rain
- formation of primitive ocean
- formation of simple organic molecules (eg:- monosaccharides, amino acids, fatty acids, nitrogen bases)
- formation of complex organic molecules (eg:- polysaccharides, proteins, nucleotides, lipids)
- formation of **primitive cell** from nucleic acids and lipids.

4. What were the possible sources of energy for chemical evolution in the primitive earth ?

Thunder and lightning, Ultra violet radiations and volcanic eruptions.

5. According to Oparin and Haldane hypotheses, life evolved in---------- as a result of chemical reactions of inorganic molecules, for millions of years, after the origin of earth.
Oceans

6. The scientists who gave support to the theory of chemical evolution ?
Stanley Miller and Harold Urey.



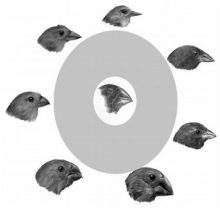
They re-created an experimental set up, in which the glass flask as the primitive atmosphere that contained methane, ammonia and water vapour. Instead of lightning or other energy sources, they passed high voltage electricity through the gaseous mixture. They condensed this gaseous mixture to water, that was considered as the *primitive ocean*. Organic molecules like amino acids were found in this.

7. Oparin : Haldane, Stanley Miller : --------- ? Ans: Harold Urey.

8. The organic substances synthesized through Urey-Miller experiment ?
Amino acids.

9. The important theories related to organic evolution. Name the proponent of each theory.
* Theory of inheritance of acquired characters by J.B. Lamarck .
* Theory of natural selection by Charles Robert Darwin.
* Neodarwinism (eg:-Theory of mutation by Hugo deVries)

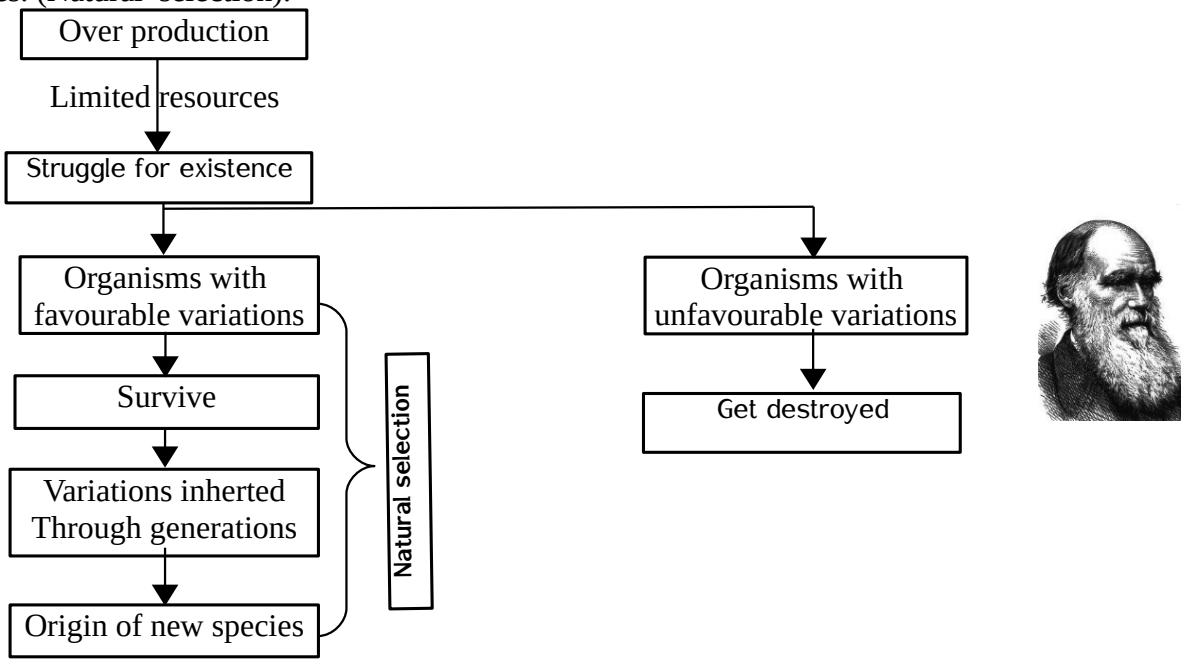
10. What were the things that influenced Charles Darwin to thought about the importance of nature in the survival or elimination of organisms ?
His studies in Galapagos Islands and the population theory of Robert Malthus.



11. The ship by which Charles Darwin reached Galapogos Islands ?
HMS Beagle.

12. Book published by Charles Darwin with his theory, Natural Selection ?
Origin Of Species by means of Natural Selection.

13. Describe the theory of **Natural Selection** (by Charles Darwin)
When over production of organisms occur, they compete for food, space, mate, and other limited resources (*Struggle for Existence*). In this struggle, only organisms with favourable variations survive in that nature. Over a long period,the favourable variations accumulate, resulting the formation of new species. (Natural selection).



14. Acquired variations : Lamarck,
Favourable variations : ---------- ? Ans: Charles Darwin.

15. According to Darwin, what might be the reasons for the peculiarities of the beaks of finches ?
The finches of Darwin's had beaks adapted to their feeding habits. When scarcity of food occurred in each island, only beaks with favourable variations (or adaptations) to that nature might have survived there.

16. The theory of Robert Malthus was also influenced Charles Darwin to thought about the importance of nature in the survival or elimination of organisms. What was Malthu's theory ?

In his theory of population, Robert Malthus pointed out that rate of food production is not proportionate to the growth rate of human population, and when scarcity of food occur, it will lead to diseases, starvation and struggle for existence.

17. What, according to Darwin, is the cause of the struggle for existence ?
Over Production and hence, limited resources.

18. What was the limitation in Darwin's theory ? Who gave sufficient explanations to this ?
Darwin could not explain the reasons for variations in organisms. However, Hugo deVries explained that one of the reasons for variations in organisms is **mutation** (sudden changes that occur in genes).

19.The branches of science which provide evidences to organic evolution.
- Palaeontology (fossil study),
- Comparative morphology,
- Biochemistry and Physiology,
- Modern molecular biology.

20. Define fossils.
Fossils are remnants of primitive organisms , preserved in earth crust.
(Fossils may be the body, body parts or imprints of organisms.)

21. What evidences of organic evolution do the study of fossils (Palaeontology) reveal ?
- Primitive fossils have simple structure.
- Recently formed fossils have complex structure.
  (The study of fossils from different layers of rocks indicate that complex structured organisms are evolved from primitive simple organisms.)
- Certain linking fossils reveal the evolution of one form of organisms from another form.

22. '**Comparative study** of structure gives evidences to evolution'. Evaluate this statement.
Though there are differences in the external structure (morphology) among different organisms , there are certain similarities in their internal structure (anatomy). The evidences from the comparative morphological studies justify the inferences that all organisms were evolved from a common ancestor.
For example,
The forelimbs in lizard, bat and whale are internally similar (in blood vessels, nerves, muscles and bones) but morphologically different (homologous organs). Reason for these differences are their adaptations to live their own habitats.

Homologous organs

23. What do you mean by **homologous organs** ?
Organs that are similar in structure but perform different functions are called homologous organs.