

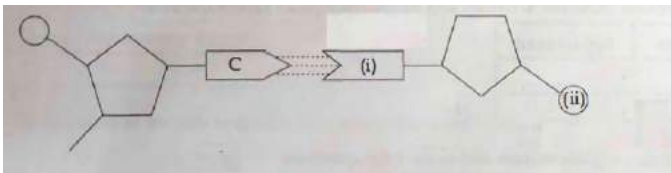
Kerala Board Class 10 Biology 2020 Question Paper with Solutions

1. The process that leads to the formation of impulses in photoreceptors is:

- a. The dissociation of visual pigments in the presence of light
- b. Formation of vitamin A in the presence of light
- c. The transmission of impulses to cerebrum through the optical nerve
- d. The reunion of retinal and opsin

Answer: (a) The dissociation of visual pigments in the presence of light

2. What are indicated by (i) and (ii) in the illustration of a DNA molecule given below?



Answer: (i) Guanine
(ii) Phosphate

3. Analyse the given symptoms and identify the disease

- Low metabolic rate
- Hypertension
- Inflammation in tissues

Answer: After analysing the given symptoms, we can identify that myxoedema is the disease.

4. Based on the given model, make a suitable pair from the following box:

Model

Charles Darwin- The theory of natural selection.

HugodeVries, Lamarck,
Chemical evolution theory, Panspermia,
Mutation Theory, Robert Malthus

Answer: Hugo deVries - Mutation theory

5. In plants, which is the chemical substance that prevents the germs, that have crossed the cell wall from entering the cell membrane?

Answer: Callose

6. Select the correct pair from the following options:

Junk genes	–	The functional genes take part in the synthesis of protein
Interferons	–	The genetic scissors used to cut genes
Genome	–	The complete genetic material present in an organism
Endorphins	–	The proteins used for the treatment of growth disorders

Answer: Genome – The complete genetic material present in an organism

7. Suitably arrange the information under the given headings:

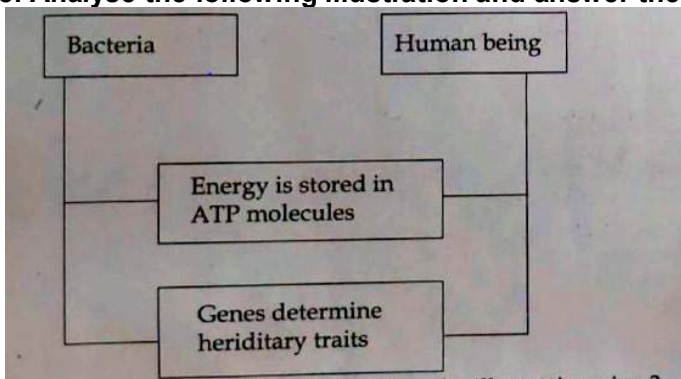
- Evokes sensation
- Co-ordinates the repeated movements during walking and running
- Impulses from different parts of the body and transmitted to and fro the brain
- Co-ordinates the muscular activities and maintains equilibrium of the body

Brain	Spinal Cord

Answer:

Brain	Spinal Cord
Evokes sensation	Co-ordinates the repeated movements during walking and running
Co-ordinates the muscular activities and maintains equilibrium of the body	Impulses from different parts of the body and transmitted to and fro the brain

8. Analyse the following illustration and answer the questions:



- What proof of evolution does this illustration give?
- Does the study of homologous organs give similar proof? How?

Answer: (a) According to the illustration given, it proves that different species that exist today share a common ancestor.

(b) Homologous organs are the organs from various animals that have the same structure but different functions. Now, by studying these organs, it becomes evident that there was a common ancestor for all these living beings. Comparative morphology also indicates proof of evolution.

9. Analyse the following statements related to certain diseases and give the reasons for each.

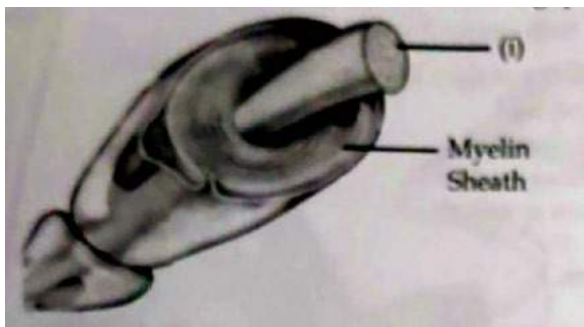
(a) In hepatitis, dark yellow colour appears in the white portion of the eyes and the nails.

(b) In diphtheria, the ash-coloured thick coating forms in the throat.

Answer: (a) When the flow of bile secreted by the liver is blocked, it gives rise to an increase in the level of the bile pigment, called bilirubin in the blood. This leads to dark yellow colour of the mucus membrane, nails and white portion of the eyes.

(b) Diphtheria is a severe bacterial infection that affects the mucous membranes of the throat and nose producing toxins, which destroy the cells of the mucus membrane. These cells that are destroyed by the toxins produce ash-coloured thick coating in the throat.

10. Observe the picture and answer the following questions:



- a. Name the part indicated as (i)
b. How does myelin sheath form?

Answer: (a) The part indicated by (i) in the illustration is Axon.

(b) **Myelin sheath:** Axon of many neurons are surrounded by a series of cells called Schwann cells. The plasma membrane of these cells contains myelin, a white fatty material. Schwann cells wrap their plasma membrane around the axon, forming an insulated covering called the myelin sheath.

11. Analyse the table related to human chromosomes and arrange the column B in accordance with column A.

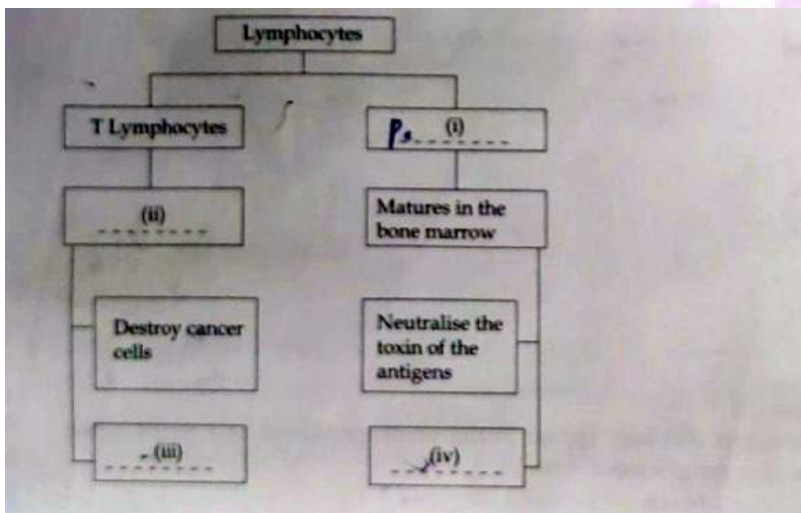
A	B
Sex chromosomes	22 + X
Somatic chromosomes	44 + XY

The chromosomes in sperms	22 pairs
The chromosomes in ovum	X, Y
	22 + X , 22 + Y

Answer:

A	B
Sex chromosomes	X, Y
Somatic chromosomes	22 pairs
The chromosomes in sperms	22 + X , 22 + Y
The chromosomes in ovum	22 + X

12. The functions of the cells in specific defence are illustrated below. Identify (i), (ii), (iii) and (iv)



Answer: (i) B- Lymphocytes
 (ii) Matures in the Thymus glands
 (iii) Stimulates other defence cells
 (iv) Disintegrate the cell membrane of bacteria or kill them / stimulate other white blood cells, which will help to destroy the pathogens

13. Analyse the following statement and answer the questions :
 "Though haemophilia is not completely curable, temporary relief can bring in."

- (a) How can temporary relief be brought in?
- (b) Why is complete cure not possible?

- Answer:** (a) Temporary relief for haemophilia is to receive replacement of the deficient protein by injecting it
(b) Complete cure for this is not possible, as it is a genetic disease

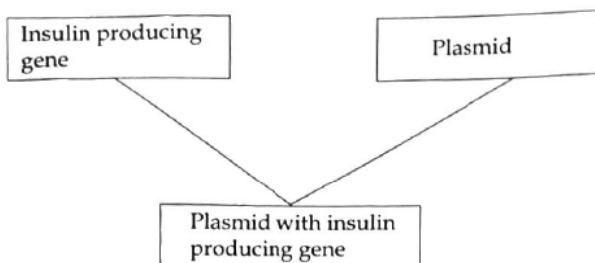
14. Observe the given steps related to the experience of taste and arrange them properly.

- Impulses reach the brain through the nerves.
- The taste detecting chemo receptors are stimulated.
- The substances reach the taste buds through saliva.
- Substances responsible for taste dissolves in saliva.
- Forms the experience of taste.
- Impulses form in the chemical receptors.

Answer:

1. Substances responsible for taste dissolve in saliva.
2. The substance reaches the taste buds through saliva.
3. The taste detecting chemo receptors are stimulated.
4. Impulses form in the chemical receptors.
5. Impulses reach the brain through the nerves.
6. Forms the experience of taste.

15. Analyse the part of an illustration related to genetic engineering and answer the following questions:



- (a) Add further steps and complete the illustration.
(b) Mention any other advantages of genetic engineering.

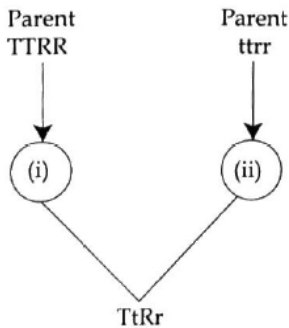
Answer: (a) Other steps that are added to complete the illustration related to artificially preparing Plasmid includes

- Insert DNA in bacterial cell.
- Provide a favourable medium for multiplication of bacteria.
- Bacteria produce inactive form of insulin.
- Produce active insulin

(b) Some advantages of genetic engineering are as given below:

- Increased supply of food having longer shelf life at reduced cost.
- Produce genetically modified plants and animals that can manufacture medicines.
- Gene therapy is used to cure genetic diseases.
- Used in Forensic and DNA tests.

16. The hybridisation process of a tall round seeded plant with a dwarf wrinkled seeded plant is illustrated below:



(a) Identify and fill (i) and (ii)

(b) What may be the characters that will appear in the plants produced as a result of the self-pollination of the first generation?

Answer: (a) (i) TR and (ii) tr

(b) Meanwhile, the characters that will appear in the plants produced as a result of the self-pollination of the first generation are given below:

- Tall plants with round seeds (TTRR, TTRr, TtRR, TtRr) .
- Tall plants with wrinkled seeds (TTrr, Ttrr).
- Dwarf plants with round seeds (ttRR, ttRr).
- Dwarf plants with wrinkled seeds (ttrr)

17. Write a short note which explains the mode of transmission and precautions of rat fever to include in a pamphlet preparing for an awareness programme.

Answer: Here are some mode of transmission of Rat fever mentioned below to be included in any pamphlet informing of an awareness programme:

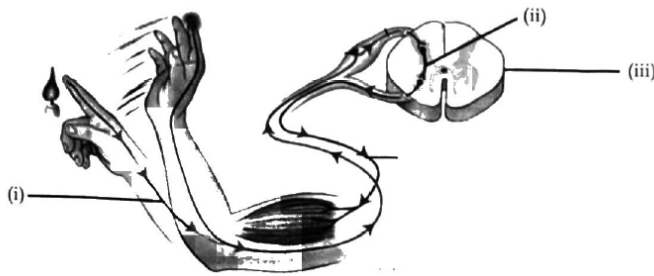
- Rat fever affects both humans and other animals
- The infection is generally transmitted to humans by water that has been contaminated by animal urine, which comes in contact with unhealed breaks in the skin, the eyes, or with the mucous membranes
- Leptospira interrogans spreads under conditions of stagnant water, flood water, humidity, and proximity between man and beast

Meanwhile, the precautions for rat fever are also given:

- Keep the surroundings clean and avoid dumping decaying substances
- Eliminate the rats

- Wear long gloves and gumboot while working in fields and streams and while stepping into stagnant water, prevent the multiplication of rat
- Diagnose and start the treatment early for best results
- Preventive vaccination is also the most effective method to fight this disease

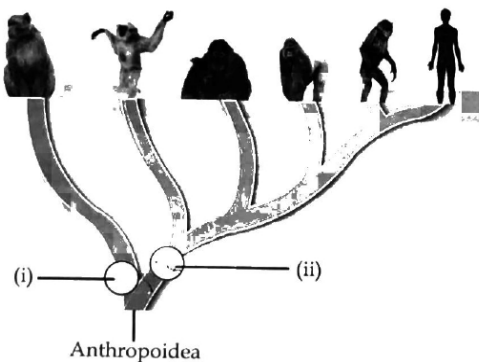
18. Analyse the illustration and answer the following questions ?



- Write the names of (i) and (ii)
- Are all accidental responses controlled by (iii)? Explain with an example.

Answer: (a) In the given figure (i) is Sensory neuron and (ii) is Inter neuron
 (b) Not all of our accidental responses are controlled by the spinal cord (iii). When light falls on our eyes or any object moves towards our eye we normally blink our eyes. This response is a cerebral reflex, under the control of the cerebrum.

19. An illustration related to human evolution is given. Analyse it and answer the following questions:



- Write the names of the categories (i) and (ii)
- Mention the two important characteristics of organisms that belong to (ii).
- How does the comparative study of haemoglobin help to identify the evolutionary relationship between man and chimpanzee ?

Answer: (a) Category (i) from the image is Cercopithecoidea and (ii) is Hominoidea
 (b) The two important organisms that belong to (ii) Hominoidea are the developed brains and the freely moveable hands
 (c) A comparative study of haemoglobin explains how an ancestral single-function molecule gave rise to descending molecules with varied functions. Haemoglobin is the molecule in red blood cells responsible for giving blood its colour and for carrying oxygen throughout the body. New functions of metallo-porphyrin rings or a kind of molecular cage embedded in proteins were developed with the appearance of atmospheric oxygen. The presence of haemoglobin in both oxygen-needing and non-oxygen needing organisms also suggests the same evolutionary roots. Meanwhile, you can see that there is no difference in the number of amino acids in the chain of haemoglobin found in the man or chimpanzee.

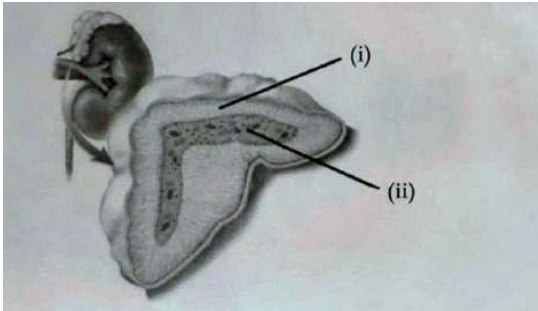
20. Select the suitable items from the box and complete the table related to the hormone defects.

GLAND	HORMONE	DEFECT	SYMPTOM
Pancreas	____(i)____	Diabetes	____(ii)____
Hypothalamus	Vasopressin	____(iii)____	____(iv)____
Pituitary	____(v)____	____(vi)____	Growth of the bones on the face and jaw

- Somatotropin
- Diabetes insipidus
- Acromegaly
- Presence of glucose in urine
- Frequent urination
- Insulin
- Hindrance in proper physical and mental development

Answer: (i) Insulin
 (ii) Presence of glucose in urine
 (iii) Diabetes insipidus
 (iv) Frequent urination
 (v) Somatotropin
 (vi) Acromegaly

21. Identify the gland indicated in the picture and answer the following questions:



- (a) Name the hormone produced by the part indicated as (i), which slows down the action of defense cells.
- (b) Name the two hormones produced by the part indicated as (ii). Give their functions.
- (c) Write two important functions of aldosterone.

Answer: (a) The hormone produced by the part (i) Cortex is Cortisole, which slows the action of defense cells

(b) Part (ii) indicated in the image is the medulla. Meanwhile, two non-steroid hormones produced by the [adrenal gland](#) are adrenaline (also called epinephrine) and noradrenaline (also called norepinephrine). Meanwhile, Adrenaline is often called the “stress hormone” as it is a major hormone secreted in response to stress. At the same time, the hormones - adrenaline and noradrenaline also serve as excitatory neurotransmitters in the sympathetic nervous system.

(c) In the meantime, the two primary and linked functions of aldosterone are given here:

- It helps to control the blood pressure or helps in blood pressure regulation
- It also helps with osmoregulation, that is the process of regulating the amounts of water and mineral salts in the blood

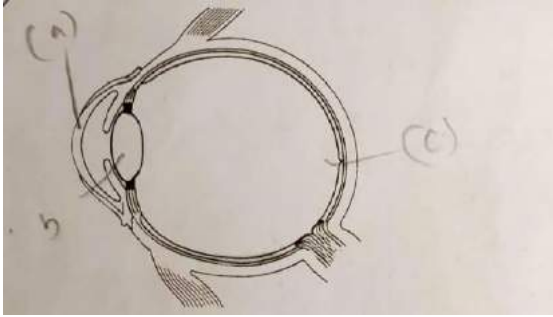
22. Explain how the body will react to the situations described below :

- (a) A foreign antigen reaches one's blood.
- (b) The components of vaccines enter the body

Answer: a) The defense activity of the recipient is stimulated when a foreign antigen reaches their blood. Then, the antigen in the blood will react with the antibody in the recipient's blood, thus resulting in clotting of the blood. Thus, we can conclude that a person cannot receive all types of blood. They can only receive the blood that matches correctly.

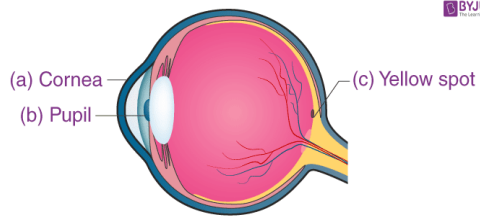
(c) Alternatively, when the components of vaccines enter the body, then it will act as the antigens that stimulate the defense mechanism of the body. Antibodies are also formed in the body against them, which are retained in the body. Later these antibodies protect the body from the pathogen that is responsible for the particular disease.

23. Redraw the picture given below. Identify the name indicated and label the parts.



- (a) The part refracts light rays into the eye.
- (b) The part that adjusts its size as the intensity of light varies.
- (c) The part of Retina where plenty of photo receptors are seen.

Answer:



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