

## Grade 10 Biology Kerala 2018

**Time : 1<sup>1/2</sup> Hours**

**Total Score : 40**

**Instructions:**

- First 15 minutes is given as Cool-off time.
- Answer only on the basis of instructions and questions given.
- Consider Score and time while answering.

**Answer any 5 questions from Question no 1 to 6. Each Question Carries 1 Mark. 5 × 1 = 5**

**Q1.** Woman Man  
 (44 + XX) (44 + XY)

What does the number " 44 " indicate in this "illustration?"

**Solution:**

The number "44" represents the number of autosomes present in an individual.

**Q2.** Find out the correct pair of the following:

- (a) Thalamus - Maintenance of homeostasis
- (b) Medulla Oblongata - Centre of thought, intelligence etc.
- (c) Cerebellum - Coordinates Muscular Activities
- (d) Cerebrum - Relaying of impulses

**Correct answer: (c)**

**Solution:**

The cerebellum coordinates voluntary movements including posture, balance, coordination, and speech, thus, resulting in smooth and balanced muscular activity.

**Q3.** Identify the word pair relation and fill the blanks:

- (a) Arrangement of nucleotides: DNA profiling
- (b) Identifying the location of a gene in DNA: .

**Solution:**

Gene Mapping

**Q4.** Which one of the following gases was not present in the atmosphere of primitive earth?

- (a) Methane
- (b) Ammonia
- (c) Oxygen
- (d) Nitrogen

**Correct answer: (c)**

**Solution:**

The primitive earth had atmosphere that was highly reduced thus holding very limited amount of oxygen. This resulted in an atmosphere filled with noxious methane, carbon monoxide, hydrogen sulfide, and ammonia.

**Q5.** Choose the names of the pheromones from the terms given in the box:

Cortisol, Bombycol, Gibberellin, Civetone

**Solution:**

Bombycol and Civetone are pheromones. Gibberellin is a plant hormone, and cortisol is a steroid hormone.

**Q6.** Fill in the blanks in the statement.

"Three types of cone cells are present in human eye. This is due to the change in \_\_\_ in the Opsin molecule".

**Solution:**

Amino Acid

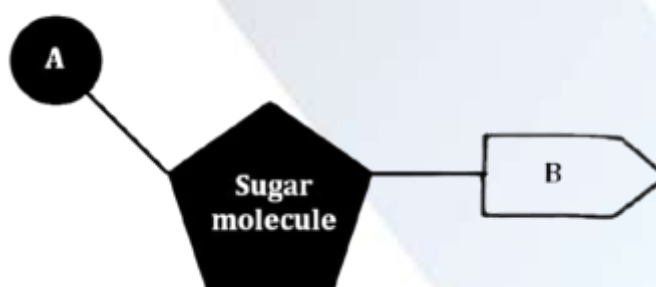
There are three types of cone cells in the human eye, differentiated by the amino

acids in the opsin molecule, which help detect different colors like red, green, and blue.

**Answer any 6 questions from Question no 7 to 13. Each Question Carries 2 Marks.**

**6 × 2 = 12**

**Q7.** (a) Identify the picture given.



(b) What do A and B indicate?

**Solution:**

The image is of Nucleotide

A - Phosphate

B- Nitrogen Base

A nucleotide contains a sugar molecule, a phosphate molecule and a nitrogen base

**Q8.** "Mucus and Cilia in the respiratory tract provide first level defense."

(a) What is the role of mucus and cilia in defense?

(b) Write an example for second level defense.

**Solution:**

(a) The mucous membrane is another protective covering of body parts.

Pathogens trapped in the mucus produced by this membrane, get destroyed. The destroyed germs are expelled out by the cilia cells of the mucous membrane.

(b) Bacteria that penetrate the mucous layer are dealt with a second line of defense. This includes Antimicrobial peptides (AMPs), also called host defense

peptides (HDPs), a part of the innate immune response secreted by the surface epithelium of the respiratory tract that kill many strains of bacteria. Bacteria that are resistant to antimicrobial peptides are also killed by a variety of reactive oxygen species produced by phagocytes.

**Q9.** List out four concepts that can be included in the pamphlet to be distributed in an awareness programme against dengue fever.

**Solution:**

Avoid stagnation of water

Use mosquito repellents and nets

Wear full sleeved clothes to avoid mosquito bites

Avoid situations that lead to the multiplication of pathogens and vectors. Keep our surroundings clean.

**Q10.** (a) Identify the disease from the following symptoms.

- Continuous muscular contraction
- Frothy discharge from the mouth
- Clenching of the teeth
- Patient falls unconscious

(b) Write the cause of this disease.

**Solution:**

(a) Epilepsy

Symptoms of Epilepsy are continuous muscular contraction, frothy discharge from the mouth, clenching of the teeth following which the patient falls unconscious.

(b) Main cause for this disease is continuous and irregular flow of electric charges in the brain.

**Q11.** "Though antibiotics are effective medicines, their regular use develops immunity in pathogens against antibiotics."

Write any two other side effects of the regular use of antibiotics.

**Solution:**

Given here are some other side effects of the regular use of antibiotics:

- Destroys useful bacteria in the body.
- Reduces the quantity of some vitamins in the body.

**Q12.** "The basis of genetic engineering is the discovery of the fact that genes can be cut and joined with the help of enzymes."

- (a) Name the enzyme used for cutting genes.  
 (b) Name the enzyme used for joining the genes.

**Solution:**

- (a) Restriction endonuclease  
 (b) ligase

Enzymes are used to cut and join genes. The enzyme restriction endonuclease is used to cut genes. This enzyme is known as 'genetic scissors'. The enzyme ligase is used for joining. This enzyme is called 'genetic glue'.

**Q13.** (a) Select the statements related to the disease Haemophilia from the following:

- Structure of haemoglobin changes.
- The synthesis of proteins that help in the clotting of blood fails.
- Oxygen carrying capacity of haemoglobin decreases.
- Excess bleeding even through minor wounds.

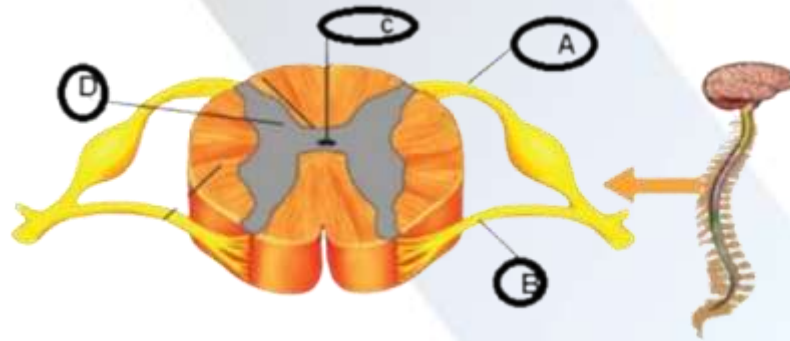
(b) Name the disease to which other statements are related.

**Solution:**

- (a) The synthesis of proteins that help in the clotting of blood fails.  
 Excess bleeding even through minor wounds.  
 (b) The disease to which other statements are related is Sickle cell anaemia.

Answer any 5 questions from Question no 14 to 20. Each Question Carries 3 Marks. 5 x 3 = 15

- Q14.** (a) Identify the below given diagram.  
 (b) Name the parts labelled A, B, C and D.



**Solution:**

- (a) The diagram shows the cross-section of the spinal cord.  
 (b) The name of the parts labelled A, B, C and D are as follows:  
 A- Dorsal Root  
 B- Ventral Root  
 C- Central Canal  
 D- Grey Matter

- Q15.** Match the plant hormones and their functions suitably.

Auxin	Helps in ripening of fruit
Gibberellin	Promoting the growth of terminal buds
Ethylene	Controls wilting of leaves, flowering etc.
Abscisic Acid	Stimulate the breakup of stored food

**Solution:**

Auxin	Promoting the growth of terminal buds
Gibberellin	Stimulate the breakup of stored food
Ethylene	Helps in ripening of fruit
Absciscic Acid	Controls wilting of leaves, flowering etc.

**Q16.** The main concepts of the two theories regarding the origin of life on earth are given.

Arrange them in the following table. Write the name of the theories as title.

- (i) Life has originated in some other planet in the universe.
- (ii) Changes occurred in the chemical substances in water, under specific conditions of the earth.
- (iii) Organic substances identified in meteors supports this theory.
- (iv) Life originated in the ocean.

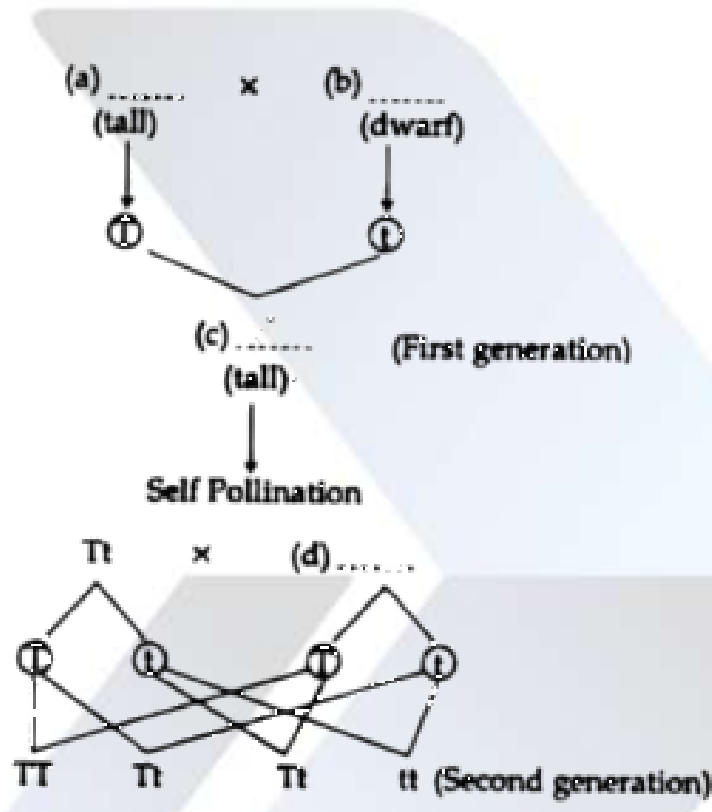
S.No.	Title -Theory 1	Title-Theory 2

**Solution:**

S.No.	(a) Theory of Chemical Evolution	(b) Panspermia Theory
(i)	Changes occurred in the chemical substances in water, under specific conditions of the earth.	Life has originated in some other planet in the universe.
(ii)	Life originated in the ocean.	Organic substances identified in meteors supports this theory.

**Q17.** Complete the illustration of hybridisation experiment conducted by Mendel in Pea plants.

(i)



(ii) Which are the characters expressed in second generation?

**Solution:**

(i) (a) TT , (b) tt, (c) Tt

(ii) 3- Tall and 1 Dwarf (Tt)

**Q18.** How do the following substances protect the plants from diseases?

- (a) Lignin
- (b) Callose
- (c) Cuticle



**Solution:**

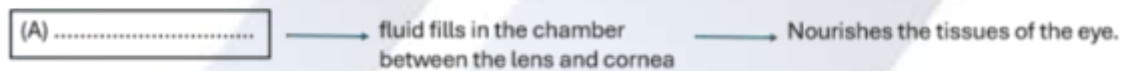
- (a) Lignin- Provides rigidity to the cell walls.
- (b) Callose-is a polysaccharide formed in the cell wall that prevents the entry of germs which have crossed the cell wall through the cell membrane.
- (c) Cuticle- a water permeability barrier serving as a defense mechanism against the entry of microbes. It prevents the entry of germs through leaves.

- Q19.** (a) Name the factors that lead to transformation of normal cells into cancer cells.  
 (b) Name two methods used in the treatment of cancer.

**Solution:**

- (a) The normal cells get transformed into cancerous cells when the control system of cell division fails. This may be due to environmental factors, smoking, radiations, virus, hereditary factors, etc.
- (b) Surgery, chemotherapy, radiation therapy etc., are extensively used in the treatment of cancer.

- Q20.** (i)



- (ii)



- (a) What do A, B and C indicate in the above illustration?
- (b) How do conjunctiva and tears protect the eye?

**Solution:**

- (a) (i) A- Aqueous humor
- (ii) B-Vitreous humor, C- jelly like substance seen in the vitreous chamber between the retina and the lens.

(b) Conjunctiva secretes mucus which protects the anterior portion of the eye ball from being dry. Tears clean and lubricate the anterior part of the eye ball.

Lysozyme, the enzyme present in tears, destroys germs that enter the eyes

**Answer any 2 questions from Question no 21 to 23. Each Question Carries 4 Marks.** **2 × 4 = 8**

**Q21.** Arrange columns *B* and *C* according to the items in column *A*.

	A	B	C
(i)	Cataract	Infection	Diet containing Vitamin A
(ii)	Glaucoma	Lens became opaque	Hygiene
(iii)	Conjunctivitis	Cornea become dry and opaque	Laser Surgery
(iv)	Xerophthalmia	Increased pressure in the eyes	Lens replacement surgery

**Solution:**

	A	B	C
(i)	Cataract	Lens became opaque	Lens replacement surgery
(ii)	Glaucoma	Increased pressure in the eyes	Laser Surgery
(iii)	Conjunctivitis	Infection	Hygiene
(iv)	Xerophthalmia	Cornea become dry and opaque	Diet containing Vitamin A

**Q22.** Certain hormones released from the anterior lobe of pituitary gland are given.

- Thyroid Stimulating Hormone (TSH)
- Adreno Cortico Tropic Hormone (ACTH)
- Gonadotropic Hormone(GTH)

(a) Write the common feature of these hormones.

(b) Write one function of ACTH and TSH.

(c) Name two hormones secreted by the action of GTH.

**Solution:**

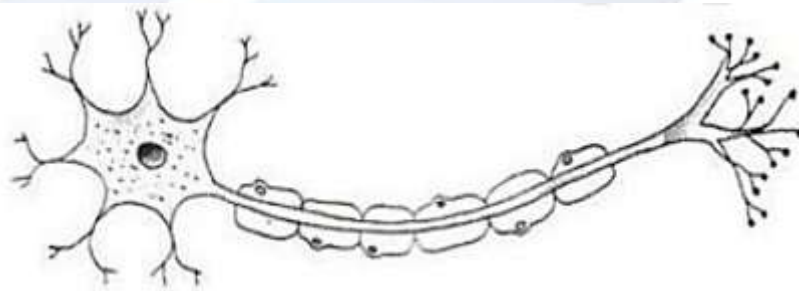
(a) The anterior lobe of the pituitary gland produces hormones which regulate the functions of other endocrine glands. These are tropic hormones.

(b) ACTH- stimulates the activity of adrenal cortex.

TSH-stimulates the activity of the thyroid gland.

(c) Gonado Tropic Hormone (GTH) causes the pituitary gland in the brain to produce and secrete the hormones luteinizing hormone (LH) and follicle-stimulating hormone (FSH). In men, these hormones cause the testicles to manufacture testosterone, while in women, they cause the ovaries to produce estrogen and progesterone.

**Q23.** Redraw the diagram. Name and label the parts indicated below.



(a) Carries impulses away from the cell body.

(b) Secretes neurotransmitter

(c) Branches of dendrons

Solution:

