Grade 10 Kerala Biology 2017

Time: $1^{1/2}$ Hours **Total Score: 40**

Instructions:

- First 15 minutes is given as cool-off time. This time is to be used for reading and understanding the questions.
- Write down Solutions for all questions based on scores and time specified for each.
- Solution: only on the basis of instructions and questions given.
- 7 and 9 are questions having choices, only one needs to be solutioned.

Q1. Following are the sense organs seen in four different organisms. Name the sense organ seen in Shark.

(a) Eye spot (b) Ommatidia

(c) Lateral line (d) Jacobson's organ

Solution:

(c) Lateral line is the sense organ seen in sharks.

Q2. "Human life is possible on earth only with the existence of many diverse ecosystem."

Analyse the statement and Solution: the following questions:

(a) List any 2 human intervention that can cause extinction of organisms.

(b) How extinction of other organisms affect human beings?

Solution:

(a) Deforestation, Environmental pollution,

(b) Extinction of organisms effect the food chain. Human are affected badly because each species in a food chain are inter connected. If any one of the tropic level is destructed it can affect the organism in the food chain directly or indirectly. Since man is a part of the chain, any change in the food chain will affect man.

Q3. (a) Analyse the complete the table showing plant hormones and their functions.

Hormone	Function
Cytokinin	…… (i) ……
…… (ii) ……	Gaseous hormone helps in the ripening of fruits
…… (iii) ……	Breaks up stored food by stimulating production of enzyme during seed germination.
Abscisic acid	…… (iv) ……

(b) Name the artificial hormone which is used as a weedicide.

Solution:

(a) (i) Promotes cell division, cell growth and cell differentiation.

(ii) Ethylene

(iii) Gibberellins

(iv) Controls dormancy of embryo in the seed, dropping of leaves and fruits, flowering, wilting of leaves, etc.

(b) 2,4-D (2,4-Dichloro phenoxy acetic acid)

Q4. Nowadays cancer is one of the most dreaded diseases in the world.

(a) List any four reasons for transformation of normal cells to cancer cells.

(b) What are the methods used for the treatment of Cancer?

Solution:

(a) Various reasons such as environmental factors, smoking, radiations, hereditary factors and alterations lead to the transformation of normal cells into cancer cells,

(b) Surgery, Chemotherapy, Radiation therapy, etc.

Q5. Phagocytosis is a process of engulfing and destroying germs.

(a) Prepare a flowchart showing the phagocytosis of a pathogen using the following hints:

Hints:

(i) Engulf pathogen in membrane sac.

(ii) The enzymes in lysosome destroys pathogen.

(iii) Membrane sac combines with the lysosome.

(iv) Phagocytes reach near pathogen.

(v) Expels the remnants.

(b) Name the two phagocytes seen in our blood.

Solution:

(a) Phagocytes reach near pathogens → Engulf pathogen in membrane sac → A Membrane sac combines with lysosome → The enzymes in lysosome destroys the pathogens → Expels the remnants,

(b) Monocytes and Neutrophils.

Q6. During a discussion in a biology class, some students argued that it is not fair to critisize a mother for delivering female children only. Substantiate your Solution: scientifically with the help of an illustration.

Solution:

Sex chromosomes are different. XX in female and XY in male. The XY chromosomes of father determines whether the child is male or female. There is 50:50 possibility to have a boy or girl child.

Q7. (A) A debate is to be conducted in the class about "Genetic engineering – its beneficial and harmful effects."

(a) Write two beneficial and two harmful effects of genetic engineering.

(b) Name the enzymes used as genetic scissors and genetic glue.

OR

(B) DNA finger printing is an important technique in the field of Genetic engineering.

(a) Name the person who proposed this technique.

(b) List the uses of DNA finger printing.

Solution:

(A) "Genetic engineering – its beneficial and harmful effects."

(a) Beneficial effects of Genetic Engineering

- Plants and animals that produce medicines.
- Remedy for genetic diseases.

Harmful effects of Genetic Engineering

- Genetically modified varieties cause harm to indigenous varieties and may cause health issues to humans.
- Application of genetically modified pathogens and pathogens multiplied through biotechnology upon enemies is called Bio-war

(b) Genetic Scissors – Restriction Endonuclease, Genetic glue – Ligases.

(B) DNA finger printing is an important technique in the field of Genetic engineering.

(a) Alec Jeffrey proposed the technique of DNA fingerprinting.

(b) Uses of DNA finger printing:

- Helpful to find out hereditary characteristics.
- To identify real parents in cases of parental disputes.
- To identify persons found after long periods of missing due to natural calamities or wars.

Q8. Observe the illustration given below. These birds paved the way to formulate the theory of natural selection by Charles Darwin.

Woodpecker finch

Ancestor finch

Insectivorous finch

(a) What are the peculiarities of these birds which help in the formulation of the theory?

(b) How this peculiarity helps these birds in their survival?

Solution:

(a) Though the finches look similar to one another they had differences in their beaks.

(b) Finches have beaks according to their food habits. Insectivorous finches have small beaks and those that feed on cactus plant have long and sharp beaks. Wood peckers that feed on worms from holes in tree trunks have sharp pointed beaks and the ground finches that feed on seeds have large beaks.

Q9. (A) Observe the given figure and Solution the following questions:

(a) Which activity of the body is represented by the figure?

(a) Prepare a flowchart showing the path of this activity.

OR

(B) Following are causes of 2 diseases in connection with nervous system:

A	B
Accumulation of an insoluble protein in the neural tissues of the brain.	Destruction of specialised ganglions in the brain. Production of dopamine, a neurotransmitter in the brain gets reduced.

(a) Name the diseases A and B.

(b) Write 2 symptoms each for the diseases.

Solution:

(A) (a) Reflex action

(b) Stimulus → Sensor Neuron → Interneuron → Motor neuron → Related muscle

(B) (a) A– Alzheimer's, B– Parkinson's

(b) **Symptoms:** Alzheimer's disease

- Loss of memory
- Inability to recognize friends and relatives

Symptoms: Parkinson's disease

- Loss of body balance
- Shivering of the body

Q10. Auditory canal of ear is lined with small hairs and wax. Write the significance of these hair and wax in auditory canal.

Solution:

Small hairs and wax inside the canal help to prevent dust and foreign particles from entering the ear.

Q11. "The increase or decrease in hormones' adversely affects body activities." Analyse and evaluate the above statement based on the following figures. (Hints- Causes, Symptoms)

A

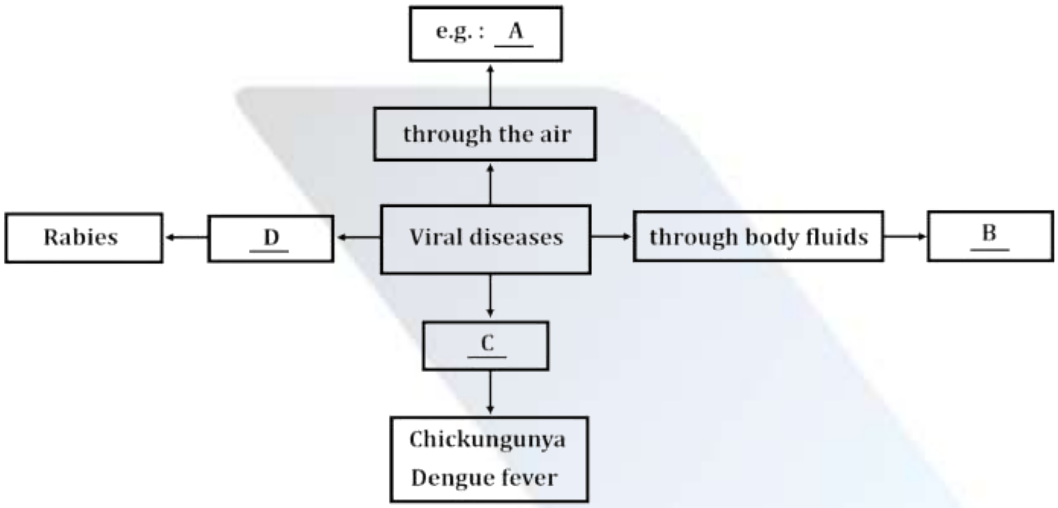
B

Solution:

(A) **Cretinism** – A condition caused by the deficiency of thyroxine during foetal stage or infancy. It leads to mental retardation and stunted growth.

(B) **Grave's disease** – A condition caused by the excessive production of thyroxine. It leads to hyperthyroidism and is characterised by bulging of eyeballs.

Q12. Complete the chart showing Viral diseases, mode of transmission and its examples.



Solution:

A – Common cold or flu/influenza

B – AIDS

C – Through mosquitoes

D – Through rabid animals

Q13. Group A shows some diagnostic equipment for the detection of diseases and Group B shows their uses. Prepare any four matching pairs using the items from Group A and Group B.

Group A

(1) Electroencephalogram (EEG) (2) CT Scanner (3) Electrocardiogram (ECG) (4) Ultrasound scanner (5) MRI scanner

Group B

(a) To obtain three-dimensional visualisation of internal organs with the help of X-ray and computer
(b) To record the electrical waves in the heart muscle
(c) To record electrical waves in the brain
(d) To understand the structure of internal organs using sound waves
(e) To obtain three-dimensional visualisation of internal organs

Solution:

(a) EEG – Records electric waves in the brain.

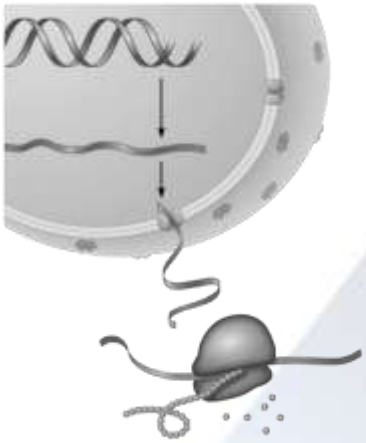
(b) CT Scanner – Get 3D visuals of internal organs with the help of a computer using X–rays.

(c) ECG – Records electric waves in heart muscles.

(d) Ultrasound Scanner – Understands the structure of internal organs using sound waves.

(e) MRI Scanner – Gets 3D visuals of internal organs.

Q14. Observe the illustration and Solution: the questions:



(a) Name the process mentioned here.

(b) List down the steps involved in this process in correct sequence.

Solution:

(a) Protein Synthesis

(b) Steps involved in Protein synthesis

- mRNA forms from DNA
- mRNA reaches outside the nucleus
- mRNA reaches ribosomes
- Different kinds of amino acids reach ribosomes.
- Based on the information in mRNA, protein is synthesized by the addition of amino acids.

Q15. In synapse the ends of neurons are not in close contact. Then how impulses are transmitted through a synapse.

Solution:

The electric impulses generated by stimuli reach the synaptic knob where certain chemical substances called **neurotransmitters** are secreted. As the neurotransmitters are released in the synaptic cleft they stimulate the adjacent dendrite and new electric impulses are formed.

Q16. Copy the figure. Identify and label the parts based on the hints given and write one function of each.

(a) Slightly projected transparent anterior part of Sclera.

(b) Part of retina where plenty of photoreceptors are seen.

(c) The aperture seen at the centre of Iris.

Solution:

(a) Cornea – Refracts light rays to focus on the retina.

(b) Yellow spot – Part of the retina where plenty of photoreceptors are seen. Point of maximum visual clarity.

(c) Pupil – Adjusts its size according to the intensity of light.