Alternative No:

Index No: | 0 | 1 | 0 | 0 | 7 | | | | | | |

Supervising Examiner's/Invigilator's initial:

Paper 3 (Biology) **Writing Time: $1\frac{1}{2}$ Hours**

Total Marks : 80

READ THE FOLLOWING DIRECTIONS CAREFULLY:

1. Do **not** write for the first **fifteen minutes**. This time is to be spent reading the questions. After having read the questions, you will be given **one and a half hours** to answer all questions.
2. Write your **index number** in the space provided on the **top right hand corner of this cover page only**.
3. In this paper, there are **two** sections: A and B. Section **A** is compulsory. You are expected to attempt **any four** questions from Section **B.**
4. The intended marks for questions or parts of questions, are given in brackets [ ].
5. Read the directions to each question carefully and write **all** your answers in the space provided in the **question booklet** itself.
6. Remember to write **quickly** but **neatly**.
7. **Do not** remove or tear off any pages from the question booklet.
8. **Do not** draw lines or pictures **on** or **in** the question booklet to beautify it.
9. **Do not** leave the examination hall before you have made sure that you have answered all the questions.

For Chief Marker's and Markers' Use Only

Question Number															**Total**	**Chief Marker's Signature ↓**
Award																
Markers' initial →																

This booklet contains 20 pages.

SECTION A (40 Marks)

Compulsory: To be attempted by all candidates.

Question 1

(a) ***Directions: Each question in this part is followed by four possible choices of answers. Choose the correct answer and write it in the space provided in the question booklet.*** **[15]**

(i) The cell organelle responsible for intracellular digestion is

A ribosome.
B lysosome.
C centrosome.
D chromosome.

Answer:…….

(ii) The valve which is present between the right auricle and right ventricle is the

A pulmonary semilunar valve.
B aortic semilunar valve.
C tricuspid valve.
D bicuspid valve.

Answer:…….

(iii) Guttation in some plants is due to

A suction force.
B hydrostatic pressure within the plant.
C osmosis in the roots.
D root pressure in the vascular tissue.

Answer:…….

(iv) What will happen when a twig is replaced by a flower stalk with no leaves in the Ganong's photometer on a sunny day?

A There will be backward movement of air bubble.
B There will be no movement of the air bubble.
C The movement of air bubble will be slow.
D The movement of air bubble will be fast.

Answer:…….

(v) The factor which does *not* affect the rate of photosynthesis is

A temperature.
B light intensity.
C velocity of wind.
D carbon dioxide concentration.

Answer:…….

(vi) The organism which normally respires anaerobically is

A cactus.
B moss.
C yeast.
D fern.

Answer:…….

(vii) The cell division which leads to the formation of eggs in animals is

A mitosis.
B meiosis.
C cytokinesis.
D karyokinesis.

Answer:…….

(viii) The condition that will result if there is lesser number of blood platelets in our body is

A leukaemia.
B blood blister.
C slow blood clotting.
D coronary thrombosis.

Answer:…….

(ix) Which of the sequences given below shows the correct passage of air from the atmosphere into our lungs and body?

A Nose → pharynx → larynx → bronchi → bronchioles → alveoli
B Nose → larynx → pharynx → bronchi → bronchioles
C Nose → pharynx → larynx → alveoli → bronchi
D Nose → mouth → larynx → bronchi → alveoli

Answer:……

(x) The part of the sperm cell which secretes an enzyme to facilitate the entry of sperm into the egg is the

A tail.
B nucleus.
C acrosome.
D axial filament.

Answer:……

(xi) A double walled cell organelle whose inner wall is thrown into folds called cristae is the

A golgi apparatus.
B mitochondria.
C ribosome.
D plastid.

Answer:……

(xii) Plants which are wall watered during midday wilt because

A water loss exceeds water absorption.
B water absorption during midday stops.
C water absorption is less during midday.
D water escapes through the open stomata.

Answer:……

(xiii) The dark reaction takes place in the

A thylakoid.
B stroma.
C stoma.
D fret.

Answer:……

(xiv) The chemical used to absorb carbon dioxide in an experiment on respiration is

A soda lime.
B lime water.
C sodium bicarbonate.
D cobalt chloride paper.

Answer:…….

(xv) Meiosis can bring about variation in organisms unlike mitosis because

A homologous chromosomes exchange segments.
B daughter cells have half sets of chromosomes.
C homologous chromosomes break up.
D four daughter cells are formed.

Answer:…….

(b) Name the following. **[10]**

(i) Accumulation of water in the body tissue due to improper functioning of the kidney.
……..

(ii) The pigment that gives colouration to skin. ……

(iii) The condition in which sweat production is unable to keep pace with its evaporation in very hot wind. …….

(iv) The only vein which starts and ends with capillaries. ……

(v) A disease caused due to mercury poisoning. ……

(vi) The loss of water in the form of vapour from minute openings on the surface of a Stem. …….

(vii) Blood plasma from which the protein fibrinogen has been removed. ……..

(viii) The air that we breathe in and out in a normal quiet breathing. …….

(ix) The process of rupturing of the follicle to release the egg. ……..

(x) The part of the ear responsible for body balance. …….

(c) Fill-in-the-blanks using appropriate terms.

(i) The organelle responsible for initiating and regulating cell division is……

(ii) The term urine is used for the fluid contained in the part of the kidney tubule called …….

(iii) Dorji can see distant objects clearly but has to wear spectacles to read the Kuensel. He is suffering from an eye defect called..……

(iv) Hormones are secreted directly into the …….

(v) The organisation concerned for the collection and supply of information about the occurrence of diseases of epidemic nature is the ……....

(d) I. State whether the following statements are TRUE or FALSE. **[3]**

(i) Aerobic respiration produces 38 molecules of ATP. …….

(ii) Urethra carries urine from the kidney to urinary bladder. ……..

(iii) The statistical study of human population is known as population density. ……..

(iv) The surgical method of contraception for women is called Tubectomy. ……..

(v) The observable characteristics which are genetically controlled is called phenotype. ……..

(vi) Aqueous humour is a clear watery liquid found in between the lens and cornea. ……

II. ***REWRITE ONLY*** the false statements from (i) to (vi) in their correct form by changing the ***underlined*** word/s only. **[2]**

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(e) Match each item under column A with that which is most appropriate in Column B. You must rewrite the correct matching pairs in the space provided.

Column A	**Column B**
1. Afferent neuron	(a) initiates heart beat
2. Adrenalin	(b) increases the surface tension for grip
3. Pace maker	(c) carries impulse away from the brain and spinal cord
4. Artery	(d) increases heart beat
5. Sweat pores	(e) carries blood away from the heart to other parts of the body
	(f) carries impulses towards the brain and spinal cord
	(g) helps growth
	(h) carries blood away from the Bowman's capsule

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SECTION B (40 Marks)

Attempt any four questions

Question 2

(a) The diagram given below represents a root hair. Study the diagram and answer the following questions.

(i) Label the parts numbered 1 to 4 in the space provided below. **[2]**

1……

2……

3……

4……

(ii) What role is played by the following parts in the up take of water into the root hair? **[1]**

1. Part 2

……

……

……

2. Number 3

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(iii) Describe what will happen if you put excess fertilizer around the root hair.

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(b) Given below is an example of a certain structure and its special function.

Example, Ribosome: protein synthesis

On a similar pattern complete the following. **[5]**

(i) Blood platelets : ……

(ii) Alveoli : ……..

(iii) Hydathodes : …….

(iv) Kidney : ……

(v) Chlorophyll : …….

Question 3

(a) A healthy potted plant with variegated leaves was watered and left in the sunlight for several hours. A leaf was then plucked and tested for starch.

(i) What is the aim of the experiment? **[1]**

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(ii) What will you observe after the leaf has been tested for starch? **[1]**

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(iii) Explain your observations made in (ii).

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(b) Explain briefly the following statements. **[6]**

(i) Our eye has the power to focus the image at different distances to see them clearly.

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(ii) Rapid rise in population started with the scientific and industrial revolution.

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(iii) Pancreas is both a duct gland as well as a ductless gland.

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Question 4

(a) (i) Complete the table given below with appropriate terms. Write the answers in the space provided below. **[4]**

Parts of the cell	**Characteristics**	**Function**
Cytoplasm	**A …….**	**B ……**
C ……..	Net work of fibres found inside the nucleus.	**D …….**

A……

B……

C……

D……

(ii) Give *two* differences between a plant cell and an animal cell in the table given below. **[2]**

Plant cell	**Animal cell**

(b) Give the scientific terms for each of the following: **[4]**

(i) The pressure under which water passes from the living cells of a root into the xylem.

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(ii) The recovery of plasmolysed cell by putting it into the water.

……

(iii) The passive absorption of water by substances such as cellulose and starch.

……

(iv) The escape of sap from the cut or ruptured surface of a plant.

……

Question 5

(a) In the space given below draw a neat diagram of the internal structure of the human eye and label the following parts: **[3]**

(i) retina

(ii) yellow spot

(iii) cornea

(iv) pupil

(b) (i) Write *two* differences between mitosis and meiosis in the table given below. **[2]**

Mitosis	**Meiosis**

(ii) Give *two* differences between active and passive immunity in the table given below.

Active immunity	**Passive Immunity**

(c) Complete the table given below. Write the answers in the space provided below. **[2½]**

Structure	**Function**
Guard cells	**1…….**
2……..	Transportation of prepared food in the plant
Glomerulus	**3……**
X and Y chromosomes	**4……..**
5……	Cell organelle responsible for cellular respiration.

1……

2……

3……

4……

5……

Question 6

(a) The diagram given below shows a part of the human respiratory system. Study the diagram and answer the questions that follow.

(i) 1. Name the gases exchanged from the alveolus to the blood vessel. **[1]**

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2. Name the gases exchanged from the blood vessel to alveolus.

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(ii) Name and define the process by which gases get exchanged in between alveolus and blood vessels. **[2]**

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(b) (i) Write down *two* differences between anaerobic respiration in plants and anaerobic respiration in animals in the table given below.

Anaerobic respiration in plants	**Anaerobic respiration in animals**

(ii) What happens during Glycolysis and Kreb's cycle? Write in the table given below. **[2]**

Glycolysis	**Kreb's cycle**

(c) Homozygous dominant tongue roller (RR) marries to a heterozygous dominant tongue roller (Rr).

(i) Work out with the help of a pedigree chart showing the inheritance of tongue rolling ability. **[2]**

(ii) What is the ratio of homozygous dominant and heterozygous dominant tongue roller

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Question 7

(a) Give suitable explanations for the following: **[4]**

(i) The increase in carbon dioxide level in the atmosphere brings climatic changes.

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(ii) Growing leguminous plants increase soil fertility.

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(b) Write one function for each of the following: **[6]**

(i) Red Cross

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(ii) BCG vaccine

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(iii) Sebaceous gland

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(iv) Epididymis

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(v) Cowper's gland

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(vi) Vas deference

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