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Provincial Department of Education - NWP

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Third Term Test - Grade 12 - 2023

Index No. .....

Biology - I

Time - 2hrs

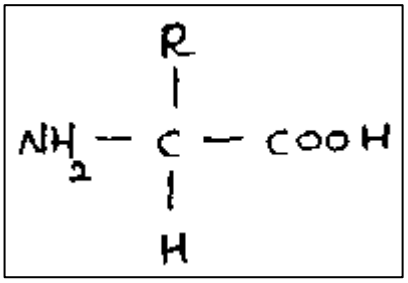
1) Examples for linear polysaccharides are,

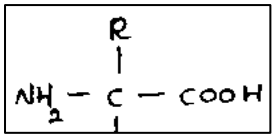
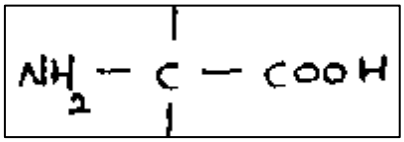
1. Glycogen, Hemicellulose
2. Cellulose, Amylopectin
3. Amylose, Glycogen
4. Cellulose, Amylose
5. Amylopectin, Hemicellulose

2) Which of the following allows water to act as a universal solvent?

1. Ionic nature
2. Polarity
3. High cohesion
4. High Adhesion
5. High cohesion and adhesion

3) Which parts of an amino acid creates its backbone?



1. All groups except R and H
2. All groups including R and H
3. All groups except R
4. 
5. 

4) Locations where check points are found,

1. G_1, S, G_2
2. S, G_2, M
3. G_1, S, M
4. G_0, G_1, S
5. G_1, G_2 ,M

5) Which of the following never happens in anabolic reactions?

1. Releasing energy
2. Acquisition of energy
3. Synthesis of complex molecules
4. Production of materials within biological systems
5. Absorption of free energy

6) Which bonds are important in maintaining the tertiary structure of proteins?

	Disulfide	Glycosidic	Hydrogen	Ionic	Peptide
1.	X	√	x	√	√
2.	√	x	x	√	√
3.	√	x	√	√	√
4.	X	√	x	√	√
5.	√	√	x	x	√

7) Select the correct statement.

1. A red precipitate will result, if alkaline copper sulphate is added to egg white.
2. Brick red precipitate will result when dill. H_2SO_4 is added to a sucrose solution followed by heating.
3. Sudan III will stain gingerly oil in yellow.
4. A brick red color will result when Benedict's reagent is added and mixed with a galactose solution.
5. A yellow colour will result when I_2/KI is added to corn flour.

8) Select the correct combination.

1. Muscle tissue – Tight junctions
2. Epithelium of the skin – Anchoring junction
3. Cardiac muscles - Tight junctions
4. Skin epithelium - Gap junctions
5. Animal embryo- - Communication junctions

9) The function of cholesterol molecules in the plasma membrane is to,

1. Maintain the shape of the cells
2. Communication with adjacent cells
3. Provide the selective permeability to the plasma membrane
4. Provide stability and rigidity to the membrane
5. Act as receptor molecules

10) Principles of Lamarck's hypothesis are,

1. Overproduction and variations
2. Theory of natural selection and Neo-Darwinism
3. Theory of use and disuse; and inheritance of acquired characteristics
4. Variations and competition
5. Survival of the fittest and natural selection

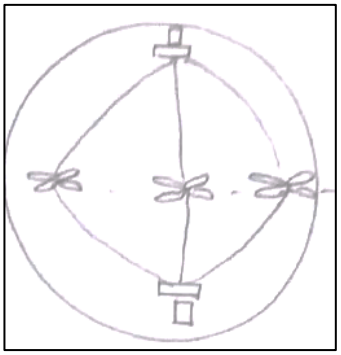
11) A phylum with vascular tissues having both homosporous and heterosporous members

1. Pterophyta
2. Gnetophyta
3. Bryophyta
4. Lycophyta
5. Cycadophyta

12) Select the incorrect statement

	Ethyl alcohol fermentation	**Lactic acid fermentation**
1.	Glycolysis is the first step	First step is glycolysis
2.	Pyruvate is the final hydrogen acceptor	Final electron acceptor is acetaldehyde
3.	CO_2 is liberated	CO2 is not liberated
4.	Two NADH molecules will be produced	2 NADH molecules are produced
5.	Performed by most bacteria	Performed by some bacteria and fungi

13) Phase of cell division illustrated here could be,



1. Metaphase II of Meiosis II or metaphase of mitosis
2. Prophase I of Meiosis I or Prophase of mitosis
3. Metaphase II of meiosis II or anaphase of mitosis
4. Metaphase I of Meiosis I or metaphase of mitosis
5. Metaphase I of meiosis I or pro-metaphase of mitosis

14) Select the incorrect statement regarding C_4 plants

1. C_4 compound breaks down in the bundle sheath cells
2. CO_2 acceptor is a C_3 compound
3. RuBisCo won't fix O_2 within C_4 plants
4. Efficiency of utilization nitrogen is greater than in C_3 plants
5. PEP carboxylase will bind with CO_2 and under certain conditions with O_2 also

15) Select the correct statement regarding enzymes.

1. Specificity of enzymes is due to the shape of the enzyme- substrate complex
2. Active site is the site to which the substrate molecule binds
3. Active site of an enzyme is not always fully complementary with the substrate
4. A specific amino acid contributes for the shape of the enzyme molecule
5. The enzyme will start its catalytic activity after the enzyme- substrate complex is formed

16) Path of hydrogen in anaerobic respiration is,

1. Glucose---- NADH----$FADH_2$----H_2O
2. Glucose----NAD^+----Lactic acid
3. Glucose----NAD^+----Ethanol
4. Glucose----NAD^+----Acetaldehyde
5. Glucose-----NAD^+---O_2

17) Glycerol produced by the breakdown of fat enters the cellular respiration via,

1. Acetyl co-enzyme A
2. Glyceraldehyde - 3 – phosphate
3. Pyruvate
4. Malate
5. Acetaldehyde

18) Percentage of ATP produced by substrate level phosphorylation during the oxidation of glucose into CO_2 and H_2O is,

1. 12%
2. 20%
3. 87%
4. 8%
5. 4%

19) Highly differentiated gametophytes and greatly reduced gametophytes are respectively found in,

1. Bryophyta and Cycadophyta
2. Lycophyta and Anthophyta
3. Pterophyta and Lycophyta
4. Pterophyta and Anthophyta
5. Bryophyta and Anthophyta

20) Select the answer in which, the structures of *Agaricus* has been arranged according to the size.

1. Basidiocarp
2. Basidium
3. Basidiospore
4. Mycelium
5. Gills

1. 4 →5→ 1→ 2→ 3
2. 5→ 1→ 4→ 2→ 3
3. 4→ 1→ 5→ 2→ 3
4. 5→ 1→ 3→ 2→ 4
5. 5→ 2→ 4→ 1→ 3

21) Select the answer in which the events relevant to the origin of life are chronologically arranged.

A. Emergence of mitochondria
B. Emergence of multicellular eukaryotes
C. Emergence of Chloroplasts
D. Emergence of cyanobacteria
E. Emergence of terrestrial plants and fungi

1. D, C, B, A, E
2. D, A, B, C, E
3. D, C, A, E, B
4. D, C, A, E, B

5. D, C, A, B, E

22) How many of the following features are displayed by the organisms of phylum Cnidaria?

1. Gastrovascular cavity
2. Polyp form
3. Medusal form
4. Cnidoblasts
5. Pseudocoelom

1. 01
2. 04
3. 02
4. 03
5. 05

23) Total number of bases present in a polynucleotide chain is 60,000. If 20% of the bases are A; how many H-bonds could be needed to connect the bases.

1. 78,000
2. 24,000
3. 36,000
4. 54,000
5. 18,000

24) Select the correct statement regarding classification.

1. The taxon; phylum was introduced by carl woose
2. 'Three domain classification' was introduced by Ernst Haeckel
3. 'Five kingdom classification' was introduced by Robert Whittaker
4. Number of common characteristics increases from species to domains through the hierarchy of taxonomic levels
5. Carolus Linnaeus was the one who classified organisms on a scientific basis

25) Organisms without a close relationship are,

1. Sea lion, Turtle, 'Parava"
2. Cockroach, millipede, Spider
3. Feather star, Starfish, Sea Lilly
4. *Planaria*, *Fasciola*, *Taenia*
5. Starfish, Jelly fish, *Obelia*

26) A functional characteristic of meristematic cells,

1. Present only at apices
2. Presence of a central nucleus and chloroplasts
3. Being roughly spherical
4. Ability to divide under suitable conditions
5. Presence of a thick cytoplasm

27) Select the correct combination in which B contains the location of the type of cells described by A.

	A	B
1.	Living cells with unevenly thickened cell walls	mature stems
2.	Irregular cells with lignified walls	pericarp of Pears
3.	Dead cells with perforation plates at the end walls	Xylem of the Cycas
4.	Live cells with perforation plates at the end walls	Phloem of gymnosperms
5.	Living cells with comparatively thin and flexible walls	Pericycle

28) Select the correct statement regarding the secondary growth,

1. An outer cell layer of the pericycle contributes for the production of cork cambium in coconut trees
2. Lenticels that located in the epidermis are responsible for the gas exchange
3. All the tissues outer to the vascular cambium of a plant subjected to secondary growth
4. Initials of the vascular cambium that are parallel to the stem
5. Secondary growth occurs in all the dicot plants

29) Select the correct statement regarding transportation of materials within plants.

1. Long distance transportation involves membranes
2. Under the influence of ABA, K^+ ions are actively pumped into the cell
3. Ions enter into the walls of the root hair cells from the soil solution by active transport.
4. Endo-osmosis takes place when a cell with a solute potential of -3MPa and a pressure potential with a +2MPa is immersed in a solution with a solute potential of -1.3 MPa which is open to the atmosphere.
5. As phloem unloading takes place water moves from the phloem to the xylem.

30) Not a factor involved in ascent of sap,

1. Transpiration
2. Cohesion of water molecules
3. Attraction of water molecules to the cellulose of the walls of the xylem
4. Water potential gradient from atmosphere through the plant to the soil solution
5. Active absorption of mineral ions into the root hair cells

31) Guttation,

1. Can be seen in most herbaceous plants
2. Results due to the upward suction of water by root pressure
3. Occurs at night
4. Extrudes water similar to that of dew

5. Occurs through the hydathodes present in leaf petioles

32) An essential element that causes retarded growth and wilting of the plant in deficiency,

1. Chlorine
2. Hydrogen
3. Carbon
4. Potassium
5. Calcium

33) Guard cells do not expand uniformly in all directions. Not a factor contributing this is,

1. Bearing chloroplasts
2. Inner wall being less elastic compared to the outer wall
3. Uneven thickening of the cell wall
4. Radial loops of cellulose microfibrils
5. Low thickness of the outer walls compared to the inner walls

34) Incorrect statement regarding plant reproduction is,

1. Diploid sporophytic generation is the result of delayed meiosis of the diploid structure resulting from fertilization.
2. Although the egg cell always resides in the gametophyte, the sperms have to come out of the gametophyte for fertilization
3. Independent gametophytes of Pogonatum are unisexual.
4. In Cycas, food is loaded to the nucellus to make the endosperm
5. Archegonia are produced in the top region of the gametophyte of Selaginella

35) Select the correct combination of tissue and its function.

1. Simple columnar epithelium – Protection
2. Cartilage tissue – Strength
3. Simple squamous epithelium – Secretion
4. Adipose tissue – Filling
5. Areolar tissue – Transportation

36) Select the correct statement regarding animal nutrition.

1. Man and lice, an example for mutualism
2. Fluid feeders suck nutrient rich fluid from live host using well adapted mouth parts
3. Animal nutrition is the process by which the organisms obtain organic food molecules by ingesting other organisms or by substances derived from other organisms.
4. Mucus contains mucin which is a glycoprotein
5. Skeletal muscles are found in the lower region of human esophagus

37) Breakdown of small polypeptides into smaller polypeptides is catalyzed by,

1. Intestinal carboxypeptidase
2. Pancreatic trypsin
3. Pancreatic carboxypeptidase
4. Intestinal chymotrypsin
5. Pepsin

38) Organisms with a closed circulatory system and an open circulatory system in respective order are,

1. Bony fishes, Cartilaginous fishes
2. Bony fishes, Amphibians
3. Annelids, Insects
4. Reptiles, Annelids
5. Bony fishes, Mammals

39) Select the answer in which the respiratory pigment and the location found is mismatched.

1. Haemoglobin – Blood of amphibians
2. Haemocyanin – Blood of arthropods
3. Chlorocruorin – Blood of annelids
4. Hemerythrin – Blood of Annelids
5. Myoglobin – Muscles of vertebrates

40) Select the correct order, in which O_2 concentration decreases.

A- Inhaled air

B – Exhaled air

C – Blood present in pulmonary veins

D – Blood present in

1. A,D,B,C
2. A,B,C,D
3. A,C,D,B
4. B,C,D,A
5. B,D,C,A

For each of the questions 41 to 50 one or more of the responses is/are correct. Decide which response/responses is /are correct and then select the correct number.

If only A, B and D are correct ……..1
If only A, C and D are correct ……..2
If only A and B are correct ……..3
If only C and D are correct ……..4
If only other response or combination of responses is correct ……..5

1	2	3	4	5
A, B, D correct.	**A, C, D** correct.	**A, B** correct.	**C, D** correct.	Any other response or combinations of responses correct.

41) Select the organelles bearing nucleic acids,

A – Ribosome

B – Golgi apparatus

C - Mitochondrion

D – Chloroplast

E – Endoplasmic reticulum

42) Unbranched membrane lipids present in,

A –Thermococcus

B – Halobacterium

C – Nostoc

D – Fungi

E – Methanococcus

43) Classes of vertebrates that has external fertilization only,

A – Osteichthyes

B – Reptilia

C – Amphibia

D – Mammalia

E – Chondrichthyes

44) Diefferences between ascospores and conidiospores are,

	Ascospores	**Conidiospores**
A	endogenous	exogenous
B	Produced during sexual reproduction	Produced during asexual reproduction
C	Produced by mitosis	Produced by meiosis
D	Produced within asci	Produced at the tip of conidiophore
E	Present in Ascomycota	Present in Zygomycota

45) Which of the following features is/are unique to prokaryotes?

A -Sensitivity to antibiotics

B - Presence of naked DNA in cytoplasm

C - Presence of peptidoglycan in cell wall

D - Ability to fix atmospheric nitrogen

E - Anaerobic respiration

46) Select the correct statement / Statements regarding the reproduction of flowering plants.

A - Self-infertility is a general adaptation that promotes cross pollination

B - There are 8 cells and 7 nuclei within the female gametophyte of angiosperms

C - Sepals are a sterile whorl

D - Presence of food reserves is a strategy for seed habit for a terrestrial life

E - Parthenocarpy occurs by the fusion of the haploid egg with two polar nuclei

47) Plant hormones that affect the fruits is/are?

A – Auxin

B – gibberellins

C – Abscisic acid

D – Ethyline

E – Cytokinin

48) Select the incorrect statement/s regarding plant responses to stimuli

A - Phototropism depends on blue light receptors

B - Direct exposure to sun light reduces far red: red ratio

C - High Auxin concentration causes root cells to elongate

D - Thigmonasty results due to the change of turgor at the pulvinus

E- Growth of a tendril towards a support structure is an example for thigmotropism

49) Not a plant response to stress,

A - Reduced cytosolic concentration of dissolved solutes such as sugars in response to cold

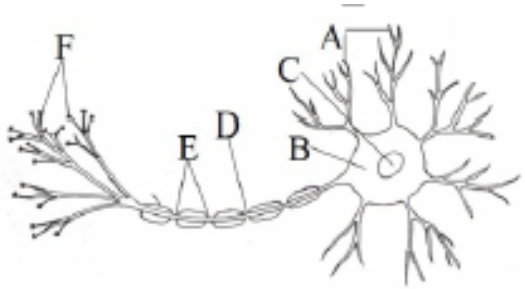
B - Production of ABA from plant stems and leaves that promote closing stomata in response to drought stress

C - Presence of salt glands in mangroves

D - Thorns, Pricks and trichomes are preexisting defense mechanisms

E - Phenolic compounds are produced in response to biotic stresses

50) Which structures of the following illustration is/are important in receiving nervous impulses?



A - A

B - B

C - C

D - D

E - E

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Third Term Test - Grade 12 - 2023

Index No. .....

Biology - II

Time - 3hrs

Part - A

Structured Essay

01. A.

i. Mention three major properties of water that are important in maintaining life on Earth.

.....

.....

.....

ii. Water is important for the existence of life on a planet. What are the reasons for that?

1.....

2.....

iii. Complete the following table.

Polysaccharide	**Monomer**	**Function**
Starch	Glucose	1.....
Glycogen	2.....	Stored in animals and fungi
3.....	Fructose	Stored in Dhalia tubers
Hemicellulose	Pentoses and hexoses	4.....
5.....	Galacturonic acid	The plant cell wall is a component of the middle lamella

iv.

a. Provide an example for each of the following.

1. Trioses (3C) - .....

2. Hexoses (C6) - .....

b. Write the name of the disaccharide relevant to the following instances.

1. Storage sugar in milk - .....

2. Translocation in phloem - .....

B.

i What is the cell cycle?

.....

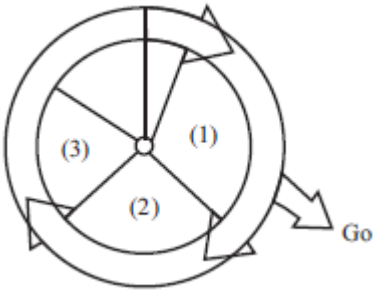
.....

ii. What are the two main phases of the cell cycle of eukaryotic cells?

1. .....

2. .....

iii. a. What is represented by the below illustration?



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b. Which phases are represented by the numbers 1, 2, and 3 of the above illustration?

1. .....

2. .....

3. .....

iv. a. Mention two importance of mitotic division.

1. .....

2. .....

b. Write down two incidents occurring at the gap -2 phase.

1. .....

2. .....

v. Give an example of a type of cell at Go.

.....

C.

i. What are the three main components of a circulatory system

.....

.....

.....

ii. Name two phyla with an open circulatory system

1. .....

2. .....

iii a. Name the three layers of the tissues found in the wall of the heart from the innermost to the outermost.

……

……

……

b. Name the components of the cardiac conduction system.

……

……

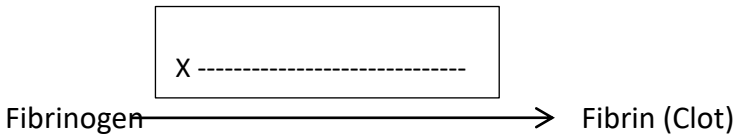
……

iv. a. What is meant by stroke volume?

……

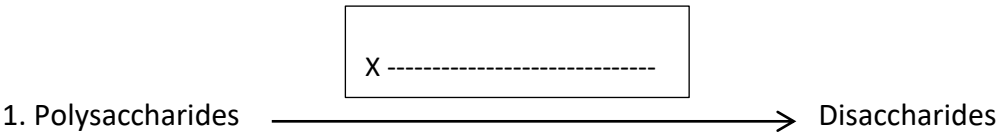
……

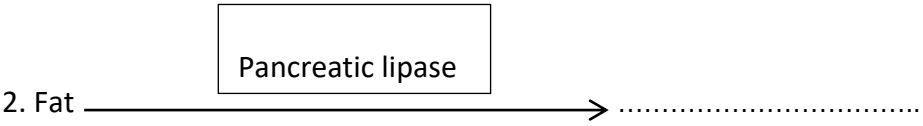
b. Name the compound X in the below-given step of the blood clotting process.

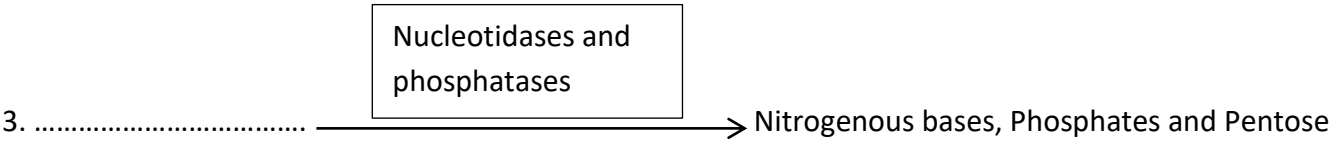


02. A.

i. Fill in the following blanks according to the chemical reactions taking place in the small intestine.







ii. One of the three regions belonging to the colon is the cecum.

a, Name the other two regions.

1. ……

2. ……

b. Mention two functions of the cecum.

1. .....

2. .....

iii. Mention two functions of the colon.

1. .....

2. .....

iv. a, Mention the three types of ducts found at the corners of the liver lobules.

1. .....

2. .....

3. .....

b. Mention two functions of dietary fibers.

1. .....

2. .....

B.

i. a. Name the two types of lateral meristems of woody plants.

1. .....

2. .....

b. Write down the respective functions of the above-mentioned types of lateral meristems.

1. .....

2. .....

ii. Compare between the shoot apex and shoot apex.

Shoot apex	Root apex
.....	.....
.....	.....

iii. a. What are the two parts belonging to the ground meristem?

1. .....

2. .....

b. What are the three types of cells present in the ground tissue?

1. .....

2. .....

3. .....

iv. What is periderm?

.....

C.

i. a. Write the names of excretory end products after the following substrates are subjected to aerobic respiration.

Substrate	Excretory end product
Fat	……
Nucleic acid	……

b. Write the names of the excretory products of the following groups of animals.

1. Bony fishes ……
2. Terrestrial snails ……

ii. a. Reasons for kidney and bladder stones are,

1. ……
2. ……

b. Three regions that could be identified in a longitudinal section of a kidney from outermost to innermost are,

1. ……
2. ……
3. ……

iii. What are the two major types of immune responses?

1. ……
2. ……

iv. Provide two examples of antimicrobial proteins that inhibit the growth of microbes.

1. ……
2. ……

03. A.

i. Complete the following table relevant to C3 and C4 plants

	C3 Plants	C4 Plants
CO_2 acceptor	A. ……	B. ……
The first product of CO_2 fixation	C. ……	D. ……

ii. a. Which colour of the visible light; Cha is most effective against?

……

b. What is meant by photoprotection?

……

……

iii. Write the locations in which the following steps of aerobic respiration take place.

1. Glycolysis……

2. Citric acid cycle ……

3. Electron transport chain ……

iv. a. Explain the respiratory quotient.

……

……

b. The first step of lactic acid fermentation is 1). …….. and, the most common organism which performs it is 2) ……..

B.

i. Mention two abilities of the very first protocell.

1. ……

2. ……

ii. a. Which molecules contained the first genes and also acted as the enzymes?

……

b. Mention two conditions of the early earth that favored the origin of life.

……

……

iii. a, What are the 3 eras of the Phanerozoic eon?

1. ……
2. ……
3. ……

iv. Provide an example of an archebacteria.

……

v. Complete the following table.

Characteristic feature	**Bacteria**	**Archea**	**Eukarya**
Cellular organization	Prokaryotic	1. ……..	Eukaryotic
DNA bound histones	Absent	Present in some species	2. ……..
The first amino acid in protein synthesis	3. ……..	Methionine	

Sensitivity to antibiotics	Inhibited growth	4.	Growth is not inhibited

C.

i. a. Write the names of respiratory pigments present in the following groups of kingdom Animalia.

1. Arthropods - ----------

2. Marine invertebrates - ----------

b.

What is represented by the QRS complex of an ECG?

.....

.....

ii. Fill in the blanks in below given table regarding stomatal activity.

During the daytime stomata open and usually close at night. Light stimulates the accumulation of ..... in the guard cells. Reduced ..... concentration within the substomatal cavities causes stomata to open.

iii. a. Name the plant hormones involved in the following functions.

1. Promotion of closure of stomata .....

2. Promotion of elongation of the stem .....

b. Write the names of two chemicals involved in the chemical defense mechanisms of plants.

1. .....

2. .....

Iv. a. Write examples for the following types of epithelial tissues.

1. Stratified squamous epithelium .....

2. Pseudostratified columnar epithelium .....

b. Write the type of connective tissue present at the following locations.

1. Tendons and ligaments .....

2. Beneath the skin; throughout the body .....

4.

A.

i. a. Commensalism is one of the symbiotic relationships. What are the other types of symbiotic relationships?

1. .....
2. .....

b. Provide an example for commensalism.

.....

Ii. a. Write the names of two antimicrobial substances present in saliva

1. .....
2. .....

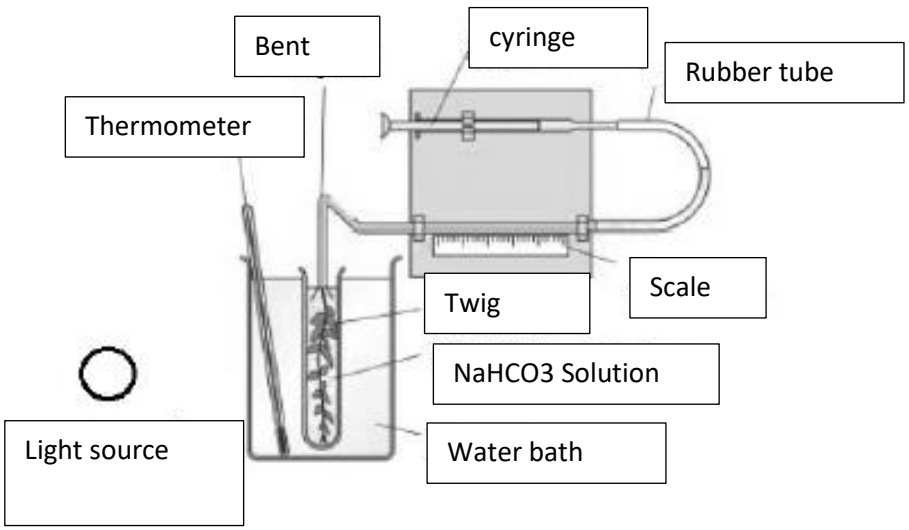
b. Write the names of two substances present in stomach juice

1. .....
2. .....

c. Which hormone is secreted by the stomach wall?

.....

Iii



a. What is the name of the above setup?

.....

b. What is examined by it?

.....

c. What is the purpose of immersing the test tube in a water bath?

.....

d. What is the reason for adding $NaHCO_3$?

.....

. iv. What can be done to reduce surface tension at the inner surface of the capillary tube?

.....

B.

1. a. What is transpiration?

.....

b. Mention two factors that affect the rate of transpiration.

1. .....

2. .....

ii. Mention the assumption made during the study of the change of rate of transpiration under various environmental conditions

.....

.....

iii a. What are the two types of photoreceptors?

1. .....

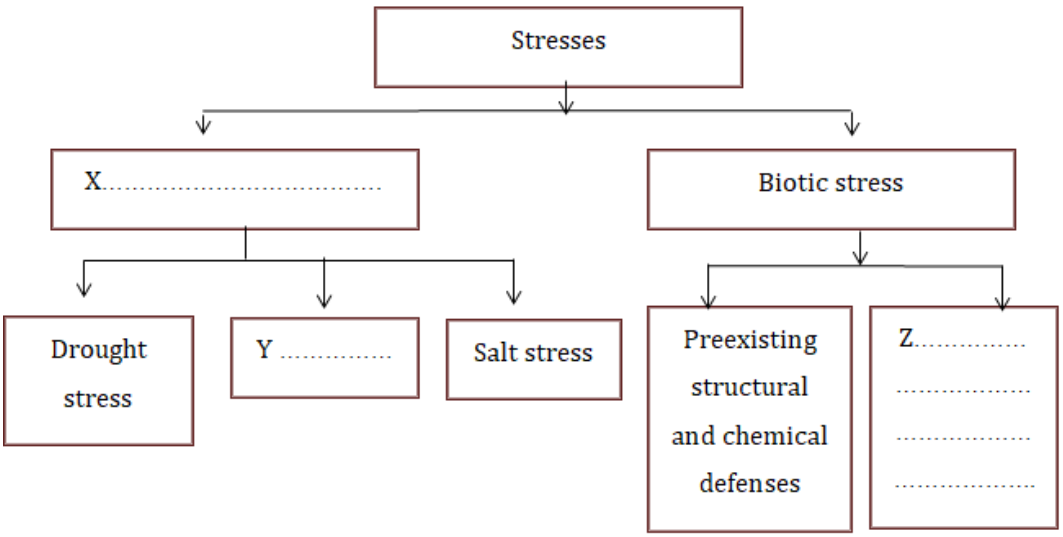
2. .....

b. Statoliths are,

.....

.....

iv.



a. Fill in the blanks for X, Y, and Z of the above chart.

X. .....

Y .....

Z .....

b. Mention two of the preexisting structural and chemical defense mechanisms.

1. .....

2. .....

C.

i. Mention three risk factors for hypertension.

1. .....

2.……

3.……

ii. a. Mention two reasons for the change in blood pressure of a person.

1.…… 2……

b. What are the two major categories of cells found in blood?

1.…… 2……

iii. a.Name a structural protein and a defensive protein.

1. Structural protein ……

2. Defensive protein ……

b. Name two nucleotides apart from those found in nucleic acids.

1.…… 2……

iv. a. Write two significant features of seed plants.

1.…… 2……

b. Write an equation for the water potential of a cell.

.……

Part - B

Essay

5. a) Describe in detail; the fluid mosaic structure of the plasma membrane.

a) Describe the functions of the plasma membrane.

6. a) Describe the fermentation process of yeast cells.

b) Describe the aerobic respiration process of a single glucose molecule within the mitochondrial matrix.

c) Describe how the rate of respiration of germinating green gram seeds is determined.

7. a) Describe the influence of various factors on transpiration.

b) Explain how root pressure is created in plants.

8. Describe the modes of nutrition in plants.

9. Define and describe the respiratory volumes and capacities.

10 Write short notes.

a) Photosystems

b) Phylum Basidiomycota

c) Endodermis of the plant roots