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ST. LAWRENCE HIGH SCHOOL

FOR GOD AND COUNTRY

A JESUIT CHRISTIAN MINORITY INSTITUTION

PRE-ANNUAL EXAMINATION-2020

Sub: BIOLOGICAL SCIENCE **Class: XI** **F.M: 70**

Duration: 3 hours 15 Minutes **Date: 18.01.2020**

SECTION –I

1. Choose the correct answer 1x14=14

i) Which of the following is not a microelement or trace element
Calcium

ii) Which plant is a short day plant?
Jute

iii) Protein part of an enzyme is called
Apoenzyme

iv) Intercalated disc is found in
Cardiac muscle

v) Which one of the following digestive juices does not contain enzyme?
Bile

vi) The name of the pathway of conduction of water through cell wall is
Apoplast

vii) When the value of R.Q. is less than 1, then
Fat is oxidised

viii) Stroke volume of cardiac output in human is
70ml

ix) Chemical name of auxin is
Indole Acetic acid

x) What is the net gain of molecules of ATP in glycolytic Pathway in absenceof O2
2 molecules

xi) Symport is one kind of
Passive transport

xii) Which of the following is a part of alimentary canal of cockroach
Mandibe

xiii) Which phase of anaerobic respiration is called amphibolic pathway
Terminal respiration

xiv) The second sound (dubb) is associated with the closure of
Semilunar

Section-II

Group –A

Answer the following questions:- **1x4=4**

1. What is pseudo-coelom?

Pseudocoelomate animals have a pseudocoelom (literally "false cavity"), which is a fluid filled body cavity. An example of a Pseudocoelomate is the roundworm.

2. What is herbarium?

   A herbarium is defined as a collection of plants that usually have been dried, pressed and preserved on sheets.

   Or

   What is the stored food present in Rhodophyceae?

   The stored food present in Rhodophyceae is Floridean starch.

3. What is stele?

   In a vascular plant, the stele is the central part of the root or stem containing the tissues derived from the procambium. These include vascular tissue, in some cases ground tissue and a pericycle, which, if present, defines the outermost boundary of the stele.

   Or

   What is ootheca?

   Female cockroaches produce egg cases, known as **oothecae.** ***Oothecae contain many eggs and are enveloped by a protein substance that gradually hardens.***

4. What is the time period of cardiac cycle?

   Assuming a healthy heart and a typical rate of 70 to 75 beats per minute, each cardiac cycle, or heartbeat, takes about 0.8 seconds to complete the cycle.

Group-B

Answer the following questions:- **2x5=10**

5. Differentiate between chlorosis and necrosis.

   Chlorosis is the appearance of yellow spots on leaves. It occurs due to the lack of chlorophylls. It is symptom of plant disease where the chlorophyll in green parts of host is destroyed due to viral infection. In contrast, necrosis is the appearance of brown spots on leaves due to death of plant cells or tissues. It is also a symptom of plant disease where death of host tissue occurs due to viral infection.

6. What is the function of leg-haemoglobin? Why is it called so?

   Leghemoglobin (also leghaemoglobin or legoglobin) is an oxygen carrier and hemoprotein found in the nitrogen-fixing root nodules of leguminous plants. It is produced by legumes in response to the roots being colonized by nitrogen-fixing bacteria, termed rhizobia, as part of the symbiotic interaction between plant and bacterium: roots not colonized by Rhizobium do not synthesise leghemoglobin.

   Leghemoglobin has close chemical and structural similarities to hemoglobin, and, like hemoglobin, is red in colour.

7. Define systematics.

   Systematics in biology is concerned with the classification systems and nomenclature of organisms. It is a branch of biological science that studies the distinctive characteristics of species and how they are related to other species through time.

   Or

   Differentiate between ascomycetes and basidiomycetes.

   BASIDOMYCETES:

1. Septa have dolipores or pores with bracket-shaped outgrowths.

2. Clamp connections occur between adjacent cells.

3. Primary mycelium is less developed.

4. Sex organs are absent.

5. Karyogamy and meiosis occur inside a basidium.

6. Basidiospores are formed exogenously.

ASCOMYCETES:

1. Septa possess simple central pores.

2. Clamp connections do not occur.

3. Primary mycelium well developed.

4. Sex organs are common.

5. Karyogamy and meiosis occur inside an ascus.

8. What is G0 stage? State an example.

The G0 phase (referred to the G zero phase) or resting phase is a period in the cell cycle in which cells exist in a quiescent state. Some examples of cells that enter G0 and stay forever are nerve cells and heart cells.

Or

Differentiate between ligases and lyases.

Ligase	*Lyase*
Ligase is an enzyme that brings about ligation of DNA or another substance.	*Lyases are a group of enzymes that catalyzes the breaking of various chemical bonds by means other than hydrolysis and oxidation, often forming a new double bond or a new ring structure.*
Ligases cause bond formation.	*Lyases cause bond cleavages.*
Ligases act through hydrolysis reactions.	*Lyases act through elimination reactions.*
Ligases act on two reactants at a time	*Lyases act on one reactant at a time.*

9. What is the function of troponin? What is the function of fascia?

Troponin, or the troponin complex, is a complex of three regulatory proteins that is integral to muscle contraction in skeletal muscle and cardiac muscle, but not smooth muscle. roponin (Tn) is the sarcomeric Ca2+ regulator for striated (skeletal and cardiac) muscle contraction. On binding Ca2+ Tn transmits information via structural changes throughout the actin-tropomyosin filaments, activating myosin ATPase activity and muscle contraction.

Each organised skeletal muscle in our body is made of a number of muscle bundles or fascicles held together by a common collagenous connective tissue layer called fascia.

Or

What is Grave's disease? Which hormone is released by the thymus gland?

Exopthalmic goitre is a form of hyperthyroidism, characterised by enlargement of the thyroid gland, protrusion of the eyeballs, increased basal metabolic rate, and weight loss, also called Graves' disease.

Thymus gland secretes the peptide hormones called thymosin.

Group – C

Answer the following questions:- 3x9= 27

10. Give any three characteristics of Pteridophytes. 3

i)Majority of the living Pteridophytes are terrestrial and prefer to grow in cool, moist and shady places e.g., ferns. Some members are aquatic, xerophytic or epiphytic
ii) Majority of the Pteridophytes are herbaceous but a few are perennial and tree like
iii) Plant body is sporophytic and can be differentiated into root, stem and leaves.
(iv) Roots are adventitious in nature with monopodial or dichotomous branching. Internally usually they are diarch.
v) Stem is usually branched. Branching is monopodial or dichotomous. Branches do not arise in the axil of the leaves. In many Pteridophytes stem is represented by rhizome.
(vi) Leaves may be small, thin, scaly (microphyllous e.g., Equisetum), simple and sessile (e.g., Selaginella) or large and pinnately compound (megaphyllous e.g., Dryopteris, Adiantum).
(vii) Vascular tissue is present in stem and root. It consists of xylem and phloem. Xylem consists of tracheids only and phloem has only sieve tubes.
(viii) The stele is protostele (e.g., Rhynia, Lycopodium), siphonostele (e.g., Equisetum), dictyostele Adiantum) or polycyclic (e.g., Angiopteris).
(ix) Cambium is absent; hence, they do not show secondary growth.

Or

Differentiate between osteichthyes and chondrichthyes. 3

Cartilaginous vs. Bony Fishes

	Cartilaginous	Bony
Scales	placoid	cycloid, ctenoid
Mouth	ventral	terminal
Tail lobes	unequal (heterocercal)	equal (homocercal)
Gills	5-7 pairs, slits	4 pairs, covers
Position in water	fins, lower density (cartilage and oily liver)	swim bladder
Osmoregulation	urea (equal solutes), rectal gland	less solutes, gill excretion
Sensory	ampullae of Lorenzini, lateral line	lateral line
Reproduction (fertilization, development, strategy)	internal, variety, fewer offspring	external, mostly ovipary more offspring

11. Differentiate between racemose and cymose inflorescence. 3

	Racemose inflorescence	Cymose inflorescence
(i)	The main axis continues to grow.	The main axis terminates in a flower.
(ii)	Growth is unlimited.	Growth is limited.
(iii)	The flowers are borne in an acropetal succession.	Flowers are borne in a basipetal succession.
(iv)	The grouping of flowers is less common and arrangement of flowers in a group is centripetal.	The grouping of flower is more common and arrangement of flowers in a group is centrifugal.

12. Distinguish between epithelial and connective tissue. 3

BASIS FOR COMPARISON	*EPITHELIAL TISSUE*	*CONNECTIVE TISSUE*
Made up of	*Cells and small amount of intercellular matrix.*	*Cells and a huge amount of intercellular matrix*
Role	*1.Mainly forms covering of the organs, internally and externally. 2.Helps in transcellular or intercellular transportation. 3.In selective absorption, protection of cells.*	*1.Support and anchors other tissue and organs. 2.Helps in muscles and bone formation. 3.Also helps in working of blood and lymph.*
Develops from	*It develops from the endoderm or mesoderm or ectoderm from the embryological germ layer.*	*Develops from mesoderm (embryonic mesodermal origin).*
Arrangement	*These cells are arranged in layers which can be either single or multi layer.*	*Here cells are present in scattered form in the matrix and does not show any arrangement.*
Surrounded by	*Does not surrounded by blood capillaries.*	*These cells are surrounded by blood capillaries.*
Location	*These tissues lie above the basement membrane.*	*These tissues lie below basement membrane, called lamina propia.*

BASIS FOR COMPARISON	*EPITHELIAL TISSUE*	*CONNECTIVE TISSUE*
Nutrition	*As epithelial cells are not bounded by blood capillaries and they gain their nutrition from the cellular membrane.*	*These types are bounded by blood capillaries and hence gain nutrition from there.*

Or

Distinguish between the anatomy of dorsiventral and isobilateral leaf. 3

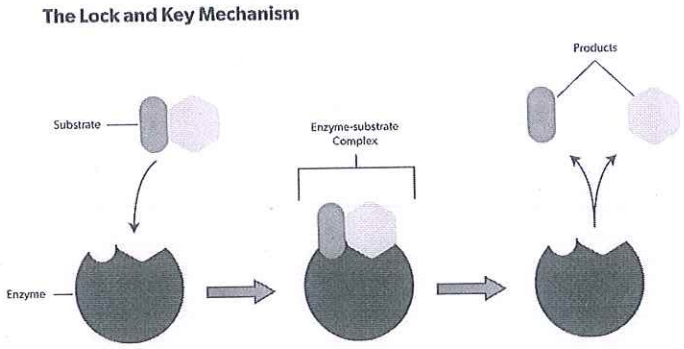
Differences between Dorsiventral and Isobilateral Leaf

Dorsiventral (Dicot) **Leaf**	**Isobilateral** (Monocot) **Leaf**
Stomata usually absent or less abundant in upper epidermis, while numerous in lower epidermis.	Stomata almost equally distributed in upper and lower epidermis.
Guard cells are kidney-shaped.	Guard cells are dumb-bell shaped.
Bulliform cells (motor cells) absent.	Bulliform cells (motor cells) present.
Mesophyll is differentiated into palisade and spongy parenchyma.	Mesophyll is undifferentiated.
Vascular bundles are arranged irregularly.	Vascular bundles are arranged in a row.
Bundle sheath cells are colourless.	Bundle sheath cells are chlorophyllous.
Bundle sheath extensions parenchymatous.	Bundle sheath extensions sclerenchymatous.
Protoxylem almost indistinguishable.	Protoxylem distinguishable.

13. Describe the 'lock and key' model of enzyme action. What is the effect of enzyme on activation energy? 2+1

The basic mechanism by which enzymes catalyze chemical reactions begins with the binding of the **substrate** (or substrates) to the active site on the enzyme. The **active site** is the specific region of the enzyme which combines with the substrate. The binding of the substrate to the enzyme causes changes in the distribution of electrons in the chemical bonds of the substrate and ultimately causes the reactions that lead to the formation of products. The products are released from the enzyme surface to regenerate the enzyme for another reaction cycle.The specific action of an enzyme with a single substrate can be explained using a **Lock and Key** analogy first postulated

in 1894 by Emil Fischer. In this analogy, the lock is the enzyme and the key is the substrate. Only the correctly sized **key (substrate) fits** into the **key hole (active site)** of the **lock (enzyme)**.



Activation energy is reduced.

Or

Describe Prophase I of meiosis along with the major events taking place in this phase. 3

During leptotene stage the chromosomes become gradually visible under the light microscope. The compaction of chromosomes continues throughout leptotene. This is followed by the second stage of prophase I called zygotene. During this stage chromosomes start pairing together and this process of association is called synapsis. Such paired chromosomes are called homologous chromosomes. Electron micrographs of this stage indicate that chromosome synapsis is accompanied by the formation of complex structure called synaptonemal complex. The complex formed by a pair of synapsed homologous chromosomes is called a bivalent or a tetrad. However, these are more clearly visible at the next stage. The first two stages of prophase I are relatively short-lived compared to the next stage that is pachytene. During this stage, the four chromatids of each bivalent chromosomes becomes distinct and clearly appears as tetrads. This stage is characterised by the appearance of recombination nodules, the sites at which crossing over occurs between non-sister chromatids of the homologous chromosomes. Crossing over is the exchange of genetic material between two homologous chromosomes. Crossing over is also an enzyme-mediated process and the enzyme involved is called recombinase. Crossing over leads to recombination of genetic material on the two chromosomes. Recombination between homologous chromosomes is completed by the end of pachytene, leaving the chromosomes linked at the sites of crossing over. The beginning of diplotene is recognised by the dissolution of the synaptonemal complex and the tendency of the recombined homologous chromosomes of the bivalents to separate from each other except at the sites of crossovers. These X-shaped structures, are called chiasmata. In oocytes of some vertebrates, diplotene can last for months or years. The final stage of meiotic prophase I is diakinesis. This is marked by terminalisation of chiasmata. During this phase the chromosomes are fully condensed and the meiotic spindle is assembled to prepare the homologous chromosomes for separation. By the end of diakinesis, the nucleolus disappears and the nuclear envelope also breaks down.

14. ***Describe the rennin-angiotensin mechanism. What is the function of ADH in the body?***
The JGA plays a complex regulatory role. A fall in glomerular blood flow/glomerular blood pressure/GFR can activate the JG cells to release renin which converts angiotensinogen in blood to angiotensin I and further to angiotensin II. Angiotensin II, being a powerful vasoconstrictor, increases the glomerular blood pressure and thereby GFR. Angiotensin II also activates the adrenal cortex to release Aldosterone. Aldosterone causes reabsorption of Na+ and water from the distal parts of the tubule. This also leads to an increase in blood pressure and GFR. This complex mechanism is generally known as the Renin-Angiotensin mechanism.

Osmoreceptors in the body are activated by changes in blood volume,body fluid volume and ionic concentration. An excessive loss of fluid from the body can activate these receptors which stimulate the hypothalamus to release antidiuretic hormone (ADH) or vasopressin from the neurohypophysis. ADH facilitates water reabsorption from latter parts of the tubule, thereby preventing diuresis. An increase in body fluid volume can switch off the osmoreceptors and suppress the ADH release to complete the feedback. ADH can also affect the kidney function by its constrictor effects on blood vessels. This causes an increase in blood pressure. An increase in blood pressure can increase the glomerular blood flow and thereby the GFR. The JGA plays a complex regulatory role. A fall in glomerular blood

2+1

Or

What do you mean by coronary artery disease? What E.C.G? 2+1

Coronary Artery Disease (CAD): Coronary Artery Disease, often referred to as atherosclerosis, affects the vessels that supply blood to the heart muscle. It is caused by deposits of calcium, fat, cholesterol and fibrous tissues, which makes the lumen of arteries narrower.
ECG is a graphical representation of the electrical activity of the heart during a cardiac cycle.A patient is connected to the machine with three electrical leads (one to each wrist and to the left ankle) that continuously monitor the heart activity. For a detailed evaluation of the heart's function, multiple leads are attached to the chest region. Here, we will talk only about a standard ECG. Each peak in the ECG is identified with a letter from P to T that corresponds to a specific electrical activity of the heart. The P-wave represents the electrical excitation (or depolarisation) of the atria, which leads to the contraction of both the atria. The QRS complex represents the depolarisation of the ventricles,which initiates the ventricular contraction. The contraction starts shortly after Q and marks the beginning of the systole.The T-wave represents the return of the ventricles from excited to normal state (repolarisation). The end of the T-wave marks the end of systole.

15. Describe the primary and secondary proteins. What is peptide bond? 2+1

The sequence of amino acids i.e., the positional information in a protein – which is the first amino acid, which is second, and so on – is called the primary structure of a protein. A protein is imagined as a line, the left end represented by the first amino acid and the right end represented by the last amino acid. The first amino acid is also called as N-terminal amino acid. The last amino acid is called the C-terminal amino acid. A protein
thread does not exist throughout as an extended rigid rod. The thread is folded in the form of a helix (similar to a revolving staircase). Of course, only some portions of the protein thread are arranged in the form of a helix. In proteins, only right handed helices are observed. Other regions of the protein thread are folded into other forms in what is called the secondary structure.
Amino acids in proteins (or polypeptides) are joined together by peptide bonds.

16. Explain the structure and function of labyrinth. 3

The fluid-filled inner ear called labyrinth consists of two parts, the bony and the membranous labyrinths. The bony labyrinth is a series of channels. Inside these channels lies the membranous labyrinth, which is surrounded by a fluid called perilymph. The membranous labyrinth is filled with a fluid called endolymph. The coiled portion of the labyrinth is called cochlea. The membranes constituting cochlea, the reissner's and basilar, divide the surounding perilymph filled bony labyrinth into an upper scala vestibuli and a lower scala tympani.

Or

Describe the mechanism of vision 3

The light rays in visible wavelength focussed on the retina through the cornea and lens generate potentials (impulses) in rods and cones. The photosensitive compounds (photopigments) in the human eyes are composed of opsin (a protein) and retinal (an aldehyde of vitamin A). Light induces dissociation of the retinal from opsin resulting in changes in the structure of the opsin. This causes membrane permeability changes. As a result, potential differences are generated inthe photoreceptor cells. This produces a signal that generates action potentials in the ganglion cells through the bipolar cells. These action potentials (impulses) are transmitted by the optic nerves to the visual cortex area of the brain, where the neural impulses are analyzed.

17. Mention the physiological functions of Cytokinin and Abscissic Acid. Write one practical application of ethylene. 2+1

Functions of Cytokinins

1 Break bud and seed dormancy.
2 Promotes the growth of the lateral bud.
3 Promotes cell division and apical dominance.
4 They are used to keep flowers fresh for a longer time.
5 Used in tissue culture to induce cell division in mature tissues.
6 Promote lateral shoot growth and adventitious shoot formation.
7 Promote nutrient mobilization which in turn helps delay leaf senescence.
8 Helps in delaying the process of ageing (senescence) in fresh leaf crops like cabbage and lettuce.
9 Involved in the formation of new leaves and chloroplast organelles within the plant cell.
10 Used to induce the development of shoot and roots along with auxin, depending on the ratio.

Functions of Abscisic acid

11 Stimulates closing of stomata in the epidermis.
12 Helps in the development and maturation of seeds.
13 Inhibits plant metabolism and seed germination.
14 It is involved in regulating abscission and dormancy.
15 It is widely used as a spraying agent on trees to regulate dropping of fruits.
16 Induces dormancy in seeds and helps in withstanding desiccation and other unfavourable growth factors.

Application of ethylene- Induce flowering in mango tree

Mention the role of carbonic anhydrase in human respiration? 3

An enzyme present in red blood cells, carbonic anhydrase, aids in the conversion of carbon dioxide to carbonic acid and bicarbonate ions. When red blood cells reach the lungs, the same enzyme helps to convert the bicarbonate ions back to carbon dioxide, which we breathe out. (Provide the necessary reactions)

18. Describe the generation and conduction of nerve impulse across a neuron. 3

When a neuron is not conducting any impulse, i.e., resting, the axonal membrane is comparatively more permeable to potassium ions (K+) and nearly impermeable to sodium ions (Na+). Similarly, the membrane is impermeable to negatively charged proteins present in the axoplasm. Consequently, the axoplasm inside the axon contains high concentration of K+ and negatively charged proteins and low concentration of Na+. In contrast, the fluid outside the axon contains a low concentration of K+ , a high concentration of Na+ and thus form a concentration gradient. These ionic gradients across the resting membrane are maintained by the active transport of ions by the sodium-potassium pump which transports 3 Na+outwards for 2 K+into the cell. As a result, the outer surface of the axonal membrane possesses a

positive charge while its inner surface becomes negatively charged and therefore is polarised. The electrical
potential difference across the resting plasma membrane is called as the resting potential.
. When a stimulus is applied at a site on the polarised membrane, the membrane at the site A becomes freely permeable to Na+. This leads to a rapid influx of Na+ followed by the reversal of the polarity at that site, i.e., the outer surface of the membrane becomes negatively charged and the inner side becomes positively charged. The polarity of the membrane at the site A is thus reversed and hence depolarised. The electrical potential
difference across the plasma membrane at the site A is called the action potential, which is in fact termed as a nerve impulse. At sites immediately ahead, the axon membrane has a positive charge on the outer surface and a negative charge on its inner surface. The rise in the stimulus-induced permeability to Na+ is extremely short-lived. It is quickly followed by a rise in permeability to K+. Within a fraction of a second, K+ diffuses outside the membrane and restores the resting potential of the membrane at the site of excitation and the fibre becomes once more responsive to further stimulation.

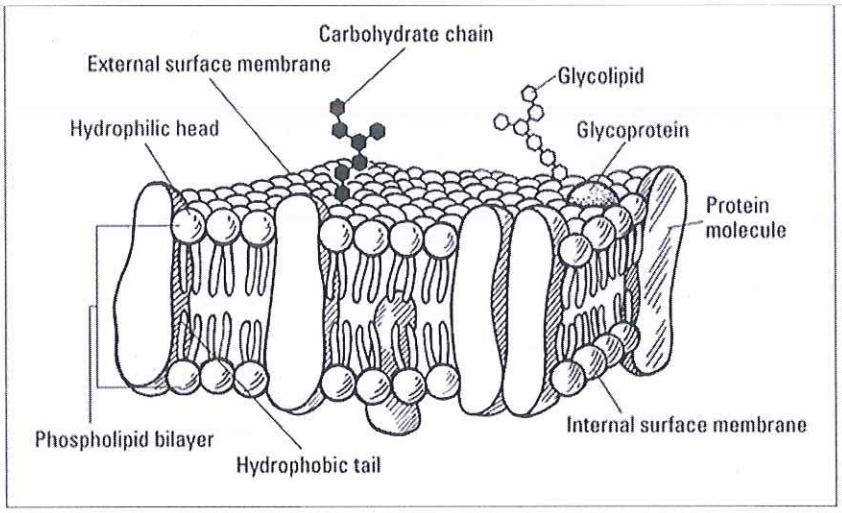
Group- D

Answer the following questions:- 5x3=15

19.Describe the 'Fluid Mosaic Model' of cell membrane with diagram. What is primary wall in a plant cell. 4+1

Fluid Mosaic Model:

The fluid mosaic model explains the structure & functional of cell membranes. According to this model, there is a lipid bilayer in which the protein molecules are embedded. The lipid bilayer gives fluidity and elasticity to the membrane. Small amounts of carbohydrates are also found in cell membrane. The model, which was devised by SJ Singer and GL Nicolson in 1972, describes the cell membrane as a two-dimensional liquid that restricts the lateral diffusion of membrane components. Such domains are defined by the existence of regions within the membrane with special lipid and protein composition that promote the formation of lipid rafts or protein and glycoprotein complexes. Another way to define membrane domains is the association of the lipid membrane with the cytoskeleton filaments and the extracellular matrix through membrane proteins. Proteins may be: Intrinsic proteins, Extrinsic proteins, Transmembrane proteins.Cholesterol is also present in the cell membrane.

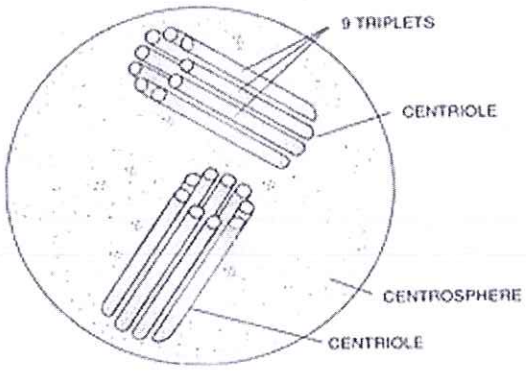


Or

Describe the ultrastructure of centrosome with diagram. 5

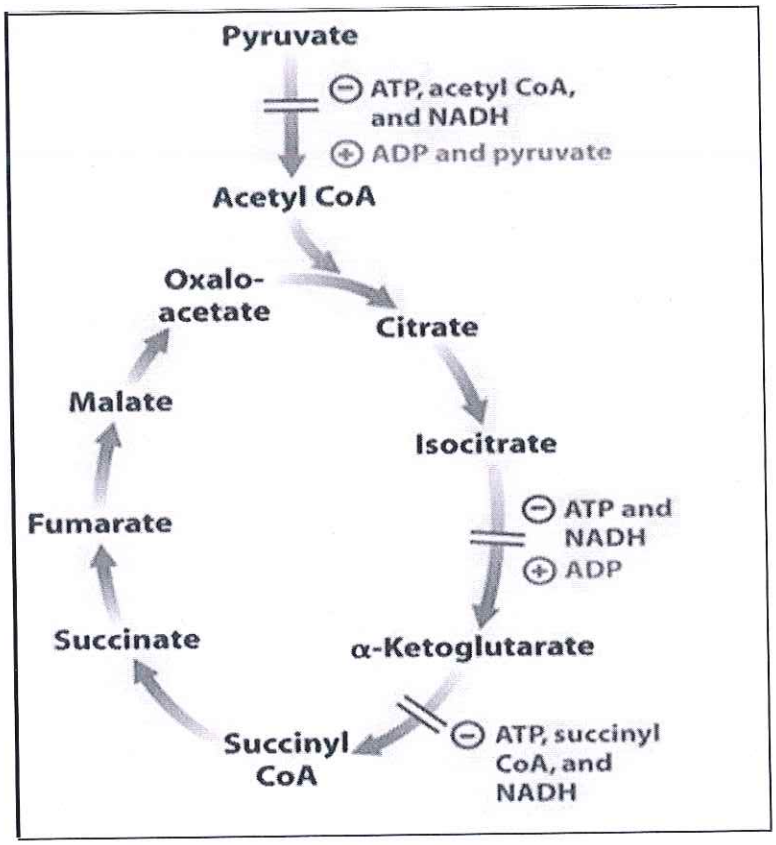
The centrosome is made up of two perpendicular centrioles, a daughter centriole linked together by interconnecting fibres. It consists of a complex of proteins that helps in the formation of additional microtubules. An amorphous pericentriolar matrix surrounds the centrioles. It is involved in the nucleation and anchoring of cytoplasmic microtubules.

Centrosome in the animal cells is very much like DNA. During cell division, one centrosome from the parent cell is transferred to each daughter cell. In proliferating cells, the centrosome starts dividing before the S-phase begins. The newly formed centrosomes participate in organizing the mitotic spindles. During Interphase, the centrosome organizes an astral ray of microtubules that help in intracellular trafficking, cell adhesion, cell polarity, etc.



20.Represent schematically the reaction of Kreb's Cycle. 5

KREB'S CYCLE:

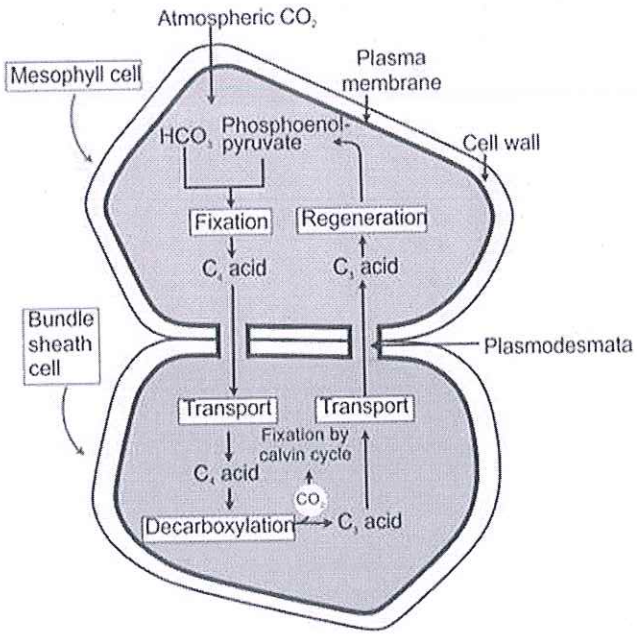


Or

Write any two ways by which C3 and C4 cycles are different from each other.
Describe the Hatch and Slack Pathway. 2+3

C_4 PATHWAY	C_3 PATHWAY
1.First stable compound is a 4 carbon compound called Oxaloacetic Acid(OAA)	*1.First stable compound is a 3 carbon compound called Phosphoglyceric acid(PGA)*
2.The plants undergoing this process show Kranz Anatomy	*2.The plants undergoing this process show Kranz Anatomy*

C_4 pathway occurs in two phases, first phase takes place in stroma of mesophyll cells, where the CO_2 acceptor molecule is 3-Carbon compound, phosphoenol pyruvate (PEP) to form 4-carbon Oxalo acetic acid (OAA). The first product is a 4-carbon and so it is named as C_4 cycle. Oxalo acetic acid is a dicarboxylic acid and hence this cycle is also known as dicarboxylic acid pathway.Carbon dioxide fixation takes place in two places one in mesophyll and another in bundle sheath cell .It is the adaptation of tropical and sub tropical plants growing in warm and dry conditions.Fixation of CO_2 with minimal loss is due to absence of photorespiration. C_4 plants require 5 ATP and 2 NADPH + H^+ to fix one molecule of CO_2.



C_4 Pathway

21.Describe the process of complete digestion of carbohydrates and proteins in human alimentary canal. 2.5+2.5

Proteins ,proteoses and peptones in the chime reaching the intestine are acted upon by the proteolytic enzymes of Pancreatic juice.

Proteins
Peptones — ***Trypsin*** → ***Dipeptides***
proteoses

Pancreatic secretion contains inactive protease precursors that become enzymatically active after interacting with another enzyme, enterokinase, which is secreted from the microvillous component of the enterocytes in the duodenal and jejunal mucosa. Trypsinogen is activated in the intestine by enterokinase, which is liberated from duodenal lining cells by the interaction of bile acids and CCK. This activation of trypsinogen to trypsin is initiated by the cleavage from it of six terminal amino acid residues. The other proteases are activated by free trypsin. The net effect of these proteases is to reduce dietary proteins to small polypeptide chains of two to six amino acids and to single amino acids. Trypsin activates the other pancreatic proteases, including chymotrypsin and elastase. Trypsin, chymotrypsin, and elastase are known as endopeptidases and are responsible for the initial breakdown of the protein chains to peptides by hydrolysis. The next step, the breakdown of these peptides to smaller molecules and then to individual amino acids, is brought about by the enzymic activity of carboxypeptidases, which are also secreted by the pancreas.

Table15.5 Digestion of Carbohydrates

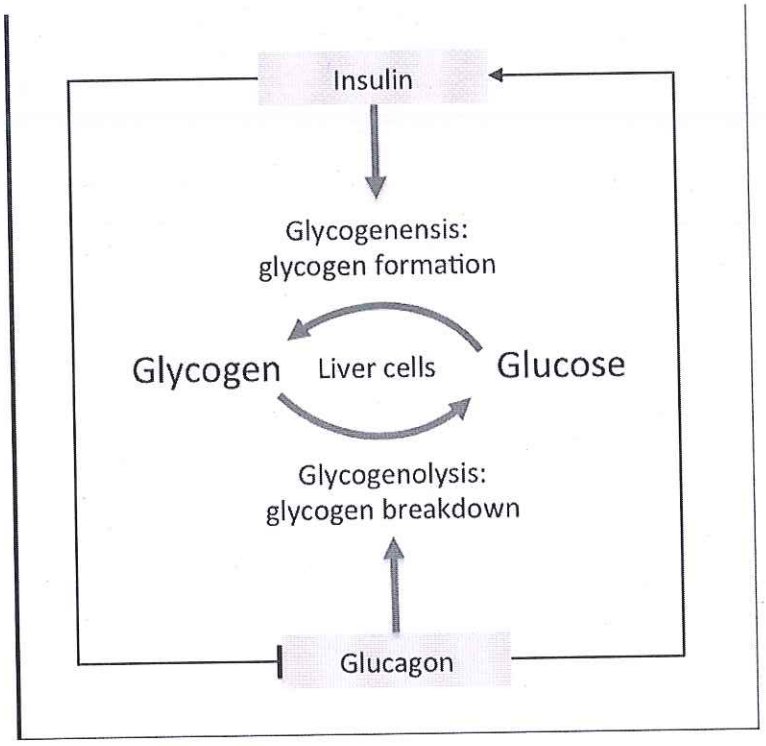
Enzyme	Produced By	Site of Action	Substrate Acting On	End Products
Salivary amylase	Salivary glands	Mouth	Polysaccharides (Starch)	Disaccharides (maltose), oligosaccharides
Pancreatic	Pancreas	Small	Polysaccharides	Disaccharides

Table15.5 Digestion of Carbohydrates

Enzyme	*Produced By*	*Site of Action*	*Substrate Acting On*	*End Products*
amylase		*intestine*	*(starch)*	*(maltose), monosaccharides*
Oligosaccharidases	*Lining of the intestine; brush border membrane*	*Small intestine*	*Disaccharides*	*Monosaccharides (e.g., glucose, fructose, galactose)*

Or

How are insulin and Glucagon related to Diabetes mellitus? Differentiate between Diabetes mellitus and Diabetes insipidus. 3+2



Diabetes mellitus occurs due to insulin resistance or insulin deficiency and subsequent high blood glucose levels. Diabetes Insipidus on the other hand develops as a result of the stilted production of a hormone called Antidiuretic hormone in the brain, which is released to stop the kidneys producing so much urine in order to retain water.
