Inter (Part-I) 2019

Biology	Group-I	PAPER: I
Time: 2.40 Hours	(SUBJECTIVE TYPE)	Marks: 68

SECTION-I

2. Write short answers to any EIGHT (8) questions: (16)

(i) Define conjugated molecules.

Ans Two different molecules belonging to different categories, usually combine together to form conjugated molecules. Carbohydrates may combine with proteins to form glycoprotein or with lipids to form glycolipids.

(ii) How enzyme concentration affects the rate of enzyme action?

Ans The rate of reaction depends directly on the amount of enzyme, present at a specific time, at unlimited substrate concentration. If the amount of enzyme is increased by twofold, the reaction rate is doubled.

By increasing the enzyme molecules, an increase in the number of active sites takes place. More active sites will convert the substrate molecules into product(s), in the given period of time. After a certain limiting concentration, the rate of reaction will no longer depend upon this increase.

(iii) Define lock and key model of enzyme.

Ans Emil Fischer (1890) proposed a Lock and Key model to visualize substrate and enzyme interaction.

According to this model, as one specific key can open only a specific lock, in the same manner a specific enzyme can transform only one substrate into products(s).

Active site is a rigid structure and there is no modification or flexibility in the active site. This model does not support all reactions.

(iv) What is enzyme to enzyme chain?

Ans In certain cases, enzymes act in a series of chemical reactions in a particular order to complete a metabolic pathway such as respiration or photosynthesis. The successive enzymes containing these reactions are normally present together in a precise order of reaction such that substrate molecules can be literally handed on from one enzyme to another forming a enzyme to enzyme chain. In this way, the products from one step in pathway are transferred to the enzyme catalyzing the next step.

(v) Differentiate between fragmentation and budding in fungi.

Ans

Fragmentation	Budding
Fragmentation is simple breaking of mycelium of some hyphal fungi, each broken fragment giving rise to a new mycelium.	Budding, unicellular yeasts reproduce by budding (an asymmetric division in which tiny outgrowth or bud is produced which may separate and grow, or by simple, relatively equal cell division).

(vi) What is mycorrhizae? Give its types.

Ans **Mycorrhizae** are mutualistic association between certain fungi and roots of vascular plants (about 95% of all kinds of vascular plants). The fungal hyphae dramatically increase the amount of soil contact and total surface area for absorption and help in the direct absorption of phosphorus, zinc, copper and other nutrients from the soil into the roots. Such plants show better growth than those without this association. The plant, on the other hand, supplies organic carbon to fungal hyphae.

There are two main types of mycorrhizae, endomycorrhizae, in which the fungal hyphae penetrate the outer cells of the plant root, forming coils, swellings, and minute branches, and also extend out into surrounding soil; and ectomycorrhizae, in which the hyphae surround and extend between the cells but do not penetrate the cell walls of the roots. These are mostly

formed with pines, firs, etc. However, the mycelium extends far out into the soil in both kinds of mycorrhizae.

(vii) Differentiate between proterostomia and deuterostomia.

Ans

Proterostomia	Deuterostomia
1. Cleavage or division of the zygote is spiral and determinate.	1. Cleavage is radial and indeterminate.
2. During development process, the mouth in these animals arises from the blastopore or from its anterior margin.	2. During embryonic development, mouth is formed at some distance anterior to the blastopore and blastopore forms the anus.

(viii) Define polymorphism. Also give example.

Ans The occurrence of structurally and functionally more than two different types of individuals, called the zooids within the same organism is called polymorphism.

For example, in Obelia, there are feeding individuals, the gastrozooids; the individuals capable of asexual reproduction only, the gonozooids, blastostyles and free-living or sexually reproducing individuals, the medusae.

(ix) What do you know about class hirudinea?

Ans **Class Hirudinea:**

They have body with fixed number of segments. Each segment has additional circular rings or markings called annuli. They do not have organs of locomotion and move due to the contraction of their body and with the help of suckers. Mostly hermaphrodite and trochophore larva is formed during development. They are aquatic. No distinct head is present but leeches have chitinous jaws for making a puncture in the skin of the host. They also have an anticoagulant secretion which is passed into the wound to allow smooth flow of blood into its digestive system where it can be stored for a long time *e.g.*, Hirudo medicinalis (medicinal leech).

(x) Write down some general characteristics of class chondrichthyes.

Ans This group includes the sharks and rays which have skeleton of cartilage but have many resemblances to the bony fishes, the cartilaginous skeleton is considered a degenerated character rather than primitive character. Their main features are:

1. Body fusiform.
2. Mouth ventral olfactory sacs not connected to mouth cavity.
3. Placoid scales on the body.
4. Endoskeleton entirely cartilaginous.

(xi) Define chemiosmosis.

Ans Chemiosomosis is the process that uses membranes to couple redox reactions to ATP production. Electron transport chain pumps protons (H^+) across the membrane of thylakoids in case of photosynthesis into the thylakoids space. The energy used for this pumping comes from the electrons moving through the electron transport chain.

(xii) Write down the molecular formulae of chlorophyll "a" and "b".

Ans The molecular formulae for chlorophyll a and b are as follows:

Chlorophyll a: $C_{55}H_{72}O_5N_4Mg$

Chlorophyll b: $C_{55}H_{70}O_6N_4Mg$

3. Write short answers to any EIGHT (8) questions: (16)

(i) Differentiate between biocontrol and bioremediation.

Ans

Biocontrol	Bioremediation
1. In biological control, pests are destroyed by using some living organisms that compete with or even eat them up.	1. Bioremediation is the removal or degradation of environmental pollutants or toxic materials by living organisms.
2. For example, an aphid that attacks walnut	2. For example, algae have been found to reduce

tree is being controlled biologically by a wasp that parasitizes this aphid.

pollution of heavy metals by bioabsorption.

(ii) What is cloning? Write one method of cloning.

Ans Cloning is a technology for achieving eugenic aims. A clone is defined as a cell or individual and all its asexually produced offspring. All members of a clone are genetically identical except when a mutation occurs.

In 1997, scientists in Scotland succeeded in cloning a sheep. Other mammalian species (mice and cows) have since been cloned. In this procedure, the nucleus from a fertilized egg is removed and a nucleus from a cell of a fully developed individual is inserted in its place. The altered zygote is then implanted in a suitable womb where it completes its development. The new individual formed, in this way, is a genetically identical clone of the individual whose nucleus was used. Thus, cloning could make multiple copies of a desired genotype.

(iii) How intermediate filaments support cell?

Ans Intermediate filaments have diameter in between those of microtubules and microfilaments. They play role in the maintenance of cell shape.

(iv) Give role of vacuole in plant cell.

Ans The plant vacuole is the major contributor to the turgor that provides support for individual plant cell and contributes to the rigidity of the leaves and younger parts of the plants.

(v) Why slime molds are included in Kingdom protoctista?

Ans Some protists superficially resemble fungi in that they are not photosynthetic and some have bodies formed of thread-like structures called hyphae. However, fungus-like protists are not fungi for several reasons. Many of these protists have centrioles and produce cellulose as a major component of their cell walls, whereas fungi lack

centrioles and have cell walls of chitin. For example, slime molds.

(vi) Differentiate between zooflagellates and dinoflagellates.

Ans

Zooflagellates	Dinoflagellates
These protists are mostly unicellular organisms with spherical or elongated bodies with a single central nucleus. They possess from one to many long, whip-like flagella that enable them to move.	One of the most unusual protist phyla is that of dinoflagellates that are unicellular. Their cells are covered with shells of interlocking cellulose plates impregnated with silicates. They are known to have occasional population explosions or blooms.

(vii) Why euglena is difficult to classify?

Ans Euglenoids have at various times been classified in plant kingdom (with algae) and in animal kingdom (in protozoans). Based on molecular data, euglenoids are thought to be closely related to zooflagellates. They are plant-like in their pigments. However, some photosynthetic euglenoids lose their chlorophyll when grown in dark and obtain their nutrients heterotrophically by ingesting organic matter. Other species of euglenoids are always colourless and heterotrophic.

(viii) Write features of chrysophyta.

Ans **Chrysophyta:**

Common name for this phylum is diatoms. The members of this phylum are usually unicellular, have no flagella for locomotion and have the pigments such as, Chl. a, Chl. c, carotenes including fucoxanthin.

Examples include Diatoma, Frequilaria, Pinnularia.

(ix) Differentiate between monocots and dicots.

Ans The plants included in Monocotyledonae are called Monocotyledonous plants or Monocots. The plants included in the dicotyledonae are called Dicotyledonous

plants or Dicots. A few distinguishing characters of the two classes are as follows:

Monocots	Dicots
1. There is only one cotyledon in the seed.	1. There are two cotyledons in the seed.
2. 3 petals, 3 sepals, or multiples of 3 are present.	2. 4 or 5 petals, or multiples of 4 or 5 are present.
3. Parallel veins are present in the leaf.	3. Net veins are present in the leaf.

(x) Which plant group is called arthrophytes and why?

Ans In sphenopsida (Horse-tails), the sporophyte is differentiated into roots, stem, and leaves. The leaves may be expanded or scale-like and are always arranged in whorls. Plants belonging to this group are also called arthrophytes because the whole plant body is composed of large number of joints. Main stem is not smooth, it has large number of ridges and furrows.

(xi) What are lenticels? Write their use.

Ans Lenticels are aerating pores formed in the bark through which exchange of gases takes place, and water is lost in the form of water vapours (transpiration). Externally, they appear as scars or small protrusions on the surface of stem. Lenticel consists of a loose mass of small, thin-walled cells. At each lenticel, the cork cambium forms oval, spherical or irregular cells, which are very loosely arranged, having lots of intercellular spaces.

(xii) Give blood route in fish circulatory system.

Ans The heart of fishes works as a single circuit heart. The blood flows in one direction only, from sinus venosus to atrium, then to ventricle and to ventral aorta via bulbus arteriosus or conus arteriosus to the gills and then to the body. The blood returns to the heart in the sinus venosus. The oxygenated blood is supplied from dorsal aorta through coronary arteries, to the heart and is carried back by coronary veins from the heart.

4. Write short answers to any SIX (6) questions: (12)

(i) What is capsid and capsomeres?

Ans The virions are composed of a central core of nucleic acid, either DNA or RNA, which is also known as the genome and is surrounded by a protein coat, the capsid. Capsid gives definite shape to virion. Capsid is made up of protein subunits known as capsomeres. The number of capsomeres is characteristics of a particular virus.

(ii) What is contribution of Louis Pasteur in microbiology?

Ans The existence of microbes was confirmed by Louis Pasteur's work. Pasteur went on making many discoveries in the field of microbiology and medicine. His main achievements are the development of vaccines for disease anthrax, fowl cholera and rabies. He also made significant contributions in development of pasteurization process and development of fermentation industries. He proved that microorganisms could cause disease.

(iii) What are hunger pangs?

Ans Hunger contractions are peristaltic contractions which are increased by low blood glucose levels and are sufficiently strong to create an uncomfortable sensation often called a "hunger pang". Hunger pangs usually begin 12 to 24 hours after previous meal or in less time for some people.

(iv) What are hemorrhoids?

Ans Piles or hemorrhoids are masses of dilated, tortuous veins in the anorectal mucosa. These masses may sometimes start bleeding during bowel movements. Situation may aggravate when the patient suffers from constipation. The urge to defecate is depressed and it becomes difficult to expel the faeces. This may cause other symptoms of ill-health because of the physical distension of the rectum.

(v) Define assimilation.

Ans Assimilation is the utilization of the products of digestion for production of energy or synthesis of cellular material.

(vi) What are spiracles?

Ans The respiratory system of the cockroach is very specialized. It consists of branching systems of air tubules called tracheae lined by chitin. The main tracheal trunk communicates with exterior by 10 pairs of apertures called spiracles, present on the lateral sides of the body.

(vii) Why photorespiration occurs in plants?

Ans Respiratory activity which occurs in plants during daytime is called photorespiration. In the process of photorespiration, carbon dioxide is released and oxygen is absorbed. The oxygen absorbed is not useful to produce energy such as ATP.

In other words, photorespiration is a light dependent process during which oxygen is absorbed and carbon dioxide is released. This oxygen is derived from the early reaction of photosynthesis.

(viii) What are parabronchi?

Ans In the lungs of birds, tiny thin-walled ducts called parabronchi are present instead of alveoli. The parabronchi are open at both ends and the air is constantly ventilated. The walls of the parabronchi are chief sites of gaseous exchange.

(ix) What is respiratory distress syndrome?

Ans Respiratory distress syndrome in premature infant is common, especially for infant with a gestation age of less than 7 months.

This occurs because enough surfactant (mixture of lipoprotein molecules produced by the secretary cells of the alveolar epithelium which forms a layer over the surface

of fluid within the alveoli to reduce the surface tention) is not produced to reduce the tendency of the lungs to collapse.

SECTION-II

NOTE: Attempt any Three (3) questions.

Q.5.(a) Write in detail, drug treatment and gene therapy. (4)

Ans If a person becomes sick with disease, he is subjected to the action of antibiotics which can kill bacteria. The antibiotics are, however, useful in bacterial disease and that only when bacteria have not developed resistance to antibiotics. In cancer, radiotherapy and chemotherapy are also used. In radiotherapy, the cancerous part is exposed to short-wave radiations from the radioactive material repeatedly at regular intervals. In Pakistan, there are several centres which are carrying out radiotherapy to control cancer. Chemotherapy consists of administrating certain anti-cancer chemicals to the patients at regular intervals. These chemicals may kill both cancerous and normal cells.

Recently, a new technique has been developed to repair defective genes. This consists of isolating the normal gene and inserting it into the host through bone marrow cells. This is called gene therapy.

Combating disease utilizing, all methods as and when required and ensuring a participation of community in this programme is known as integrated disease management. This requires awareness of the community about the severity of the problem, its causes and its remedies. This is a very effective programme for elimination and control of dangerous diseases from the human society.

(b) Discuss functions of lymphatic system.

Ans There are several functions performed by the lymphatic system:

(i) In an average person, about three liters more fluid leaves the blood capillaries than is reabsorbed by them each day. It returns this excess fluid and its dissolved proteins and other substances to the blood.

(ii) The lacteals of villi absorb large fat globules, which are released by interstitial cells after the products of digestion of fats are absorbed. After a fatty meal, these fat globules may make up 1% of the lymph.

(iii) The lymphatic system helps defend the body against foreign invaders. Lymph nodes have lymphocytes and macrophages that destroy bacteria and viruses. The painful swelling of lymph nodes in certain diseases (mumps is an extreme example) is largely a result of the accumulation of dead lymphocytes and macrophages.

(iv) Just as the lymph nodes filter lymph, the spleen filters blood, exposing it to macrophages and lymphocytes that destroy foreign particles and aged red blood cells.

Q.6.(a) Describe primary and secondary structure of protein. (4)

Ans **Primary Structure:**

The primary structure comprises the number and sequence of amino acids in a protein molecule. F. Sanger was the first scientist who determined the sequence of amino acids in a protein molecule. After ten years of careful work, he concluded, that insulin is composed of 51 amino acids in two chains. One of the chains had 21 amino acids and the

other had 30 amino acids and they were held together by disulphide bridges. Haemoglobin is composed of four chains, two alpha and two beta chains. Each alpha chain contains 141 amino acids, while each beta chain contains 146 amino acids. The size of a protein molecule is determined by the type of amino acids and the number of amino acids comprising that particular protein molecule.

Secondary Structure:

The polypeptide chains in a protein molecule usually do not lie flat. They usually coil into a helix, or into some other regular configuration. One of the common secondary structures is the α-helix. It involves a spiral formation of the basic polypeptide chain. The α-helix is very uniform geometric structure with 3.6 amino acids in each turn of the helix. The helical structure is kept by the formation of hydrogen bonds among amino acid molecules in successive turns of the spiral. β-pleated sheet is formed by folding back of the polypeptide.

(b) Discuss asexual reproduction in fungi.

Ans **Sexual Reproduction:**

Details of sexual reproduction vary in different groups of fungi but fusion of haploid nuclei and meiosis are common to all. When fungi reproduce sexually, hyphae of two genetically different but compatible mating types come together, their cytoplasm fuse followed by nuclear fusion. In two of the three main groups of fungi (Basidiomycetes, Ascomycetes), fusion of nuclei (karyogamy) does not take place immediately after the fusion of cytoplasm (plasmogamy); instead the two genetic types of haploid nuclei from two individuals may coexist

and divide in the same hyphae for most of the life of the fungus. Such a fungal hypha/cell having 2 nuclei of different genetic types is called dikaryotic (also heterokaryotic) hypha/cell.

Different groups of fungi produce different types of haploid sexual spores, such as basidiospores and ascospores, subsequent upon meiosis in zygote. These spores may be produced by their characteristic structure/fruiting bodies such as basidia/basidio carps and asci/ascocarps.

Q.7.(a) Discuss nutrition of bacteria. (4)

Ans For Answer see Paper 2017 (Group-II), Q.9.(a).

(b) Describe economic importance of poaceae.

Ans **Economic Importance:**

Economically, family Poaceae has greater importance than any other family of flowering plants. It has great economic importance to both man and animals. Cereals and millets which constitute the chief food stuff of mankind, belongs to this family. Most of the fodder crops, which are equally important to domestic animals, also belong to this family.

Plants providing food for man includes: *Triticum sp.* (Wheat), *Avena sativa* (Oats), *Zea mays* (Corn, Maize), *Oryza sativa* (Rice), *Hordeum vulgare* (Barley), *Secale cereale* (Rye), *Penisetum typhoideum*; *Sorghum vulgare*, etc.

The dried stem and leaves of the cereal crops are used as fodder for the cattle. Sugar is obtained from the juice of *Saccharum officinarum* (Sugar-cane). Many grasses are used in the lawns *e.g.*, Agrostis, Poa, Festuca, etc. and have ornamental significance.

Bambusa (Bamboo) are used as building material for the thatching huts, making boats, carts, pipes-etc. and the split stem are woven into mats, baskets, fans, hats, course umbrella. Leaves are also given to horses as a cure of cough and cold etc. Certain grasses yield aromatic oils, *e.g., Cymbopogon citratus* (lemon grass) which yield lemon grass oil is used in perfumes and soap industry and for making infusions. Some species of the grasses are used in making papers.

Ethyl alcohol and many other kind of beverages are also prepared from cereals. For example: Whisky from Rye, barley, corn and rum molasses from sugar-cane. Fibers obtained from the leaves of *Saccharum munja* which is used in making ropes.

Q.8.(a) Discuss life cycle of bacteriophage. (4)

Ans **Cycle of Bacteriophages:**

Earlier researches on bacteriophages were mainly on limited number of phages that infect *Escherichia coli*. Of these, the best known phages are T phages (T for type). Among T phages, the T_2 and T_4 phages are mainly used in phage studies. The overall structure of T_4, studied with electron microscopy, resembles that of tadpole, consisting of head and tail. The head is an elongated pyramidal (having two triangular structures with common base), hexagonal, prism-shaped structure, to which straight tail is attached. Within the head, double stranded DNA molecule is present. The structure of phage tail is more complex than head. A layer of distinct protein forms the inner tube or core, which is enclosed in sheath made up of another type of protein. On one side of sheath is

collar and on the other side is end plate. To the end plate, six tail fibers are attached, which are the structures for attachment. The volume of the phage is about 1/1000 of the host.

The bacteriophage replicates only inside the bacterial cell. The first step in the replication of a bacteriophage is its attachment (adsorption) to host cell at receptor site on the cell wall of bacterium. During attachment, weak chemical union between virion and receptor site takes place. In the next step, penetration, the tail releases the enzyme lysozyme to dissolve a portion of the bacterial cell wall. The tail sheath contracts and tail core is forced into the cell through cell wall and cell membrane. The virus injects its DNA into the cell just as the syringe is used to inject the vaccine. The protein coat, which forms the phage head and tail structure of virus remains outside the cell (Fig.). Many animal viruses, however, enter the host cell as a whole.

Fig. A phage injecting its DNA into host.

Immediately after entering the host cell, the viral nucleic acid takes the control of the host's biosynthetic machinery and induces the host cell to synthesize necessary viral components (DNA, proteins), and starts *multiplying*. About 25 minutes after initial infection, approximately 200 new bacteriophages are formed, bacterial cell bursts, *i.e.*, it undergoes *lysis*. Newly formed phages are released to infect the bacteria and another

cycle, *the lytic cycle* begins. The phage which causes lysis of the host cell is known as *lytic or virulent phage.*

All infections of bacterial cells by phages do not result in lysis. In some cases, viral DNA, instead of taking over the control of host's machinery, becomes incorporated into the bacterial chromosome. Phage in this state is called prophage and this process is known as lysogeny. In this condition, the bacterium continues to live and reproduce normally. Viral DNA being the part of bacterial chromosome passes to each daughter cell in all successive generations. Sometimes, however, the viral DNA gets detached from the host's chromosome and lytic cycle starts. This process is called induction. Lysogenic bacteria are resistant to infection by the same or related phages. The phage which causes lysogeny is called temperate (lysogenic) phage.

(b) Sketch two phases of glycolysis.

Ans **Glycolysis:**

Glycolysis is the breakdown of glucose up to the formation of pyruvic acid. Glycolysis can take place both in the absence of oxygen (anaerobic condition) or in the presence of oxygen (aerobic condition). In both, the end product of glucose breakdown is pyruvic acid. The breakdown of glucose takes place in a series of steps, each catalyzed by a specific enzyme. All these enzymes are found dissolved in the cytosol. In addition to the enzymes, ATP and coenzyme NAD (nicotinamide adenine dinucleotide) are also essential.

Glycolysis can be divided into two phases: a preparatory phase, and an oxidative phase. In the preparatory phase, breakdown of glucose occurs and energy is expended. In the oxidative phase, high energy phosphate bonds are formed and energy is stored.

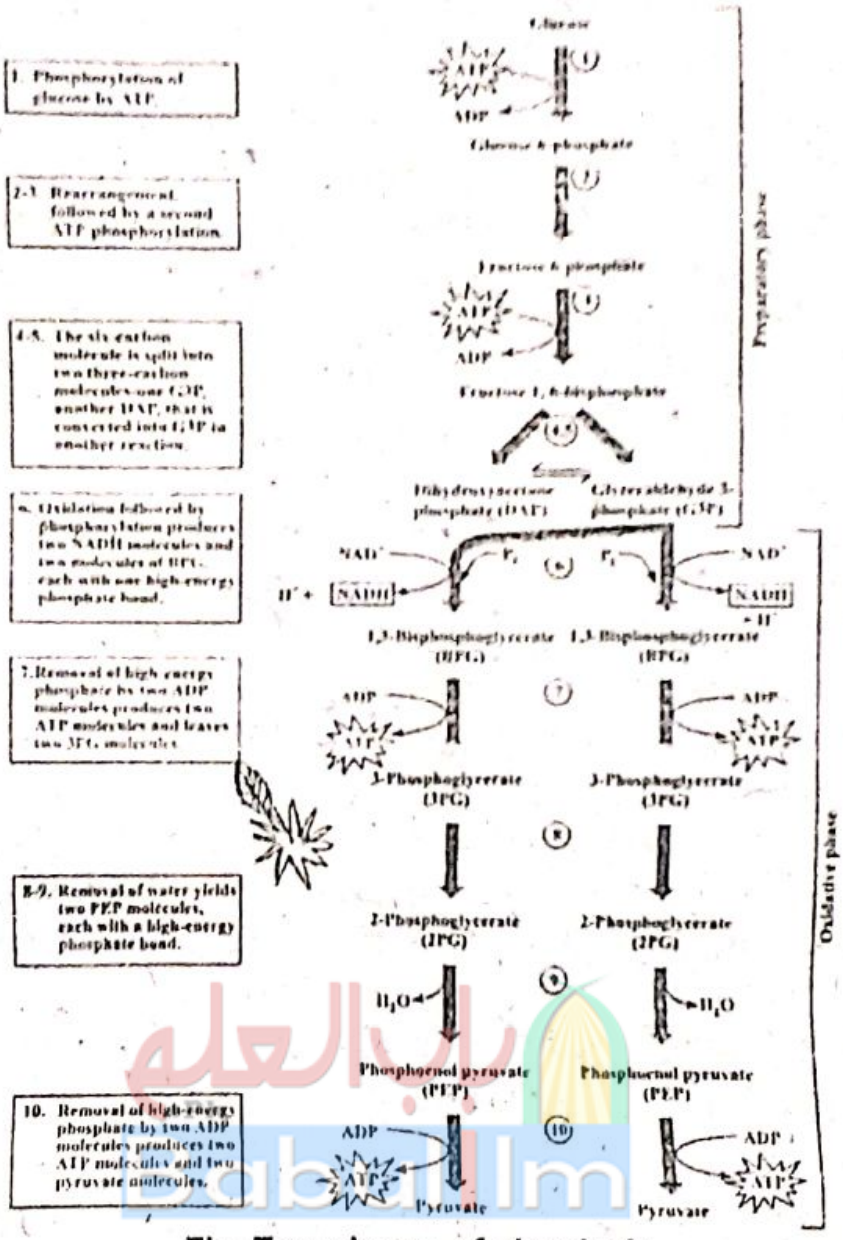

Fig. Two phases of glycolysis.
All of these reactions take place in the cytosol.

Q.9.(a) Describe structure and functions of mitochondria. (4)

Ans Mitochondria are very important organelles of eukaryotic cells, because they are involved in the manufacture and supply of energy to the cell. They are also known as the powerhouses of the cell. Under compound microscope, they appear to be vesicles, rods or filaments. Under an electron microscope, they show complex morphology. Although their number, shape and

internal structure vary widely, a mitochondrion is bound by two membranes, the outer membrane is smooth, while the inner membrane forms infoldings into the inner chamber called mitochondrial matrix. These infolds are called cristae. The mitochondrial membranes are similar in structure to other cell membranes. Detailed studies have shown that mitochondria also contain DNA as well as ribosomes.

The presence of ribosomes and DNA indicates that some proteins are synthesized in them. It is a self-replicating organelle.

The inner surface of cristae in the mitochondrial matrix has small knob-like structures known as F_1 particles. Mitochondrial matrix contains in it a large number of enzymes, coenzymes and organic and inorganic salts which help in several vital metabolic processes like Kreb's cycle, aerobic respiration, fatty acid metabolism, etc. As a result of these metabolic processes, the energy extracted from the organic food is transformed into energy-rich compound ATP, and the ATP then provides energy to the cell on demand. The size and number of mitochondria varies and depends on the physiological activity of the cell.

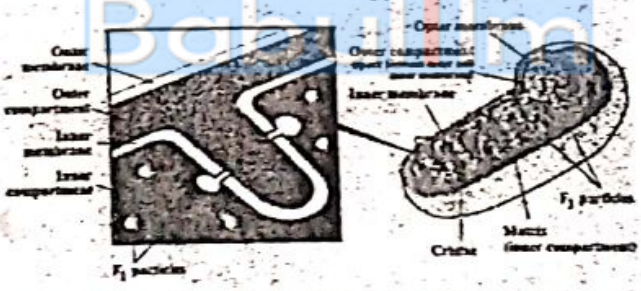

Fig. Diagrammatic representation of a mitochondrion cut longitudinally. The main features are shown. A crista is made of lipoprotein membrane containing different enzymes as well as F1 Particles embedded in it. After a special processing the inner mitochondrial membrane is ruptured and the F1 particles come out on the surface.

Mitochondria extract energy from different components of food and convert it in the form of ATP. This energy is used for various cellular activities. The spent energy, which is in the form of ADP is regenerated by the

mitochondria into ATP. Mitochondria is, therefore, described as powerhouse of the cell.

(b) Discuss process of absorption in large intestine. (4)

Ans **The role of large intestine:**

The large intestine is composed of a caecum, colon and rectum. Caecum is a blind sac that projects from the large intestine between ileum and colon. From the blind end of the caecum there arises a finger-like process called appendix. The appendix, some times gets inflamed due to entrapping and then putrification of food causing appendicitis, which has to be removed surgically in many instances.

The material that passes from the small intestine to the large intestine contains a large amount of water, dissolved salts and undigested material. Water and salts are absorbed into blood, while undigested material is rejected as faeces. The fecal matter contains a large number of bacteria, plant fibers, slouged off mucosal cells, mucus, cholesterol, bile pigments and water. Large intestine also harbors a large population of useful bacteria that synthesize some vitamins especially vitamin K, which are absorbed in blood. If the absorption of water and salt does not take place due to infection, drug action of emotional disturbance, a condition known as diarrhoea occurs. If this condition is unchecked, dehydration develops that may prove to be fatal. The other extreme condition is constipation, which is caused by the excessive absorption of water.

Rectum:

Rectum is the last part of large intestine, where feces are temporarily stored and rejected through anus, at intervals. Anus is surrounded by two sphincters, the internal is of smooth and outer of striped muscles. Under normal conditions, as the rectum is filled up with feces, it gives rise to defecation reflex. This reflex can be consciously inhibited in individuals other than infants. Gradually, the child learns to bring this reflex under control.