

## Inter (Part-I) 2017

Biology	Group-I	PAPER: I
Time: 20 Minutes	(OBJECTIVE TYPE)	Marks: 17

**Note:** Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling two or more circles will result in zero mark in that question.

1-1- **Binomial nomenclature system was given by:**

- (a) Pasteur (b) De Duve  
(c) Lamark (d) Linnaeus ✓

2- **Photosynthetic prokaryotes lack:**

- (a) Ribosomes (b) Cytoplasm  
(c) Chloroplasts ✓ (d) Cell membrane

3- **Bacteria without any flagella are:**

- (a) Monotrichus (b) Atrichus ✓  
(c) Lophotrichus (d) Amphitrichus

4- **The animal with exceptionally large brain is:**

- (a) Star fish (b) Octopus ✓  
(c) Snail (d) Sepia

5- **In human body, amount of oxygen is:**

- (a) 50 % (b) 65 % ✓  
(c) 70 % (d) 40 %

6- **Tomato belongs to family:**

- (a) Rosaceae (b) Poaceae  
(c) Solanaceae ✓ (d) Fabaceae

7- **Antiserum is a serum containing:**

- (a) Hormones (b) Antigen  
(c) Enzyme (d) Antibodies ✓

8- **Tentacles is a characteristic of:**

- (a) Hydra ✓ (b) Snail  
(c) Amoeba (d) Euglena



- 9- Single circuit circulation is found in:  
(a) Man (b) Cat  
(c) Fish ✓ (d) Bird
- 10- The most abundant carbohydrate is:  
(a) Starch (b) Cellulose ✓  
(c) Glucose (d) Maltose
- 11- Lovastatin is used for lowering blood:  
(a) Pressure (b) Cholesterol ✓  
(c) Glucose (d) Salts
- 12- Spiracles are found in:  
(a) Fish (b) Cockroach ✓  
(c) Leech (d) Earthworm
- 13- Sea anemone belongs to phylum:  
(a) Coelenterata ✓ (b) Arthropoda  
(c) Echinodermata (d) Annelida
- 14- The hypothesis that plants split water as a source of hydrogen was given by:  
(a) Van Niel ✓ (b) Kreb  
(c) Calvin (d) Pasteur
- 15- The resolution of human naked eye is:  
(a) 1.0 mm ✓ (b) 0.3 mm  
(c) 0.6 mm (d) 0.7 mm
- 16- A unicellular, non-motile green alga is:  
(a) Volvox (b) Ulva  
(c) Chlorella ✓ (d) Kelps
- 17- Induce fit model was proposed by:  
(a) Jenner (b) Pasteur  
(c) Koshland ✓ (d) Emil Fischer



## Inter (Part-I) 2017

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) Show peptide bond between two amino acids.

**Ans** Bond between two amino acids:

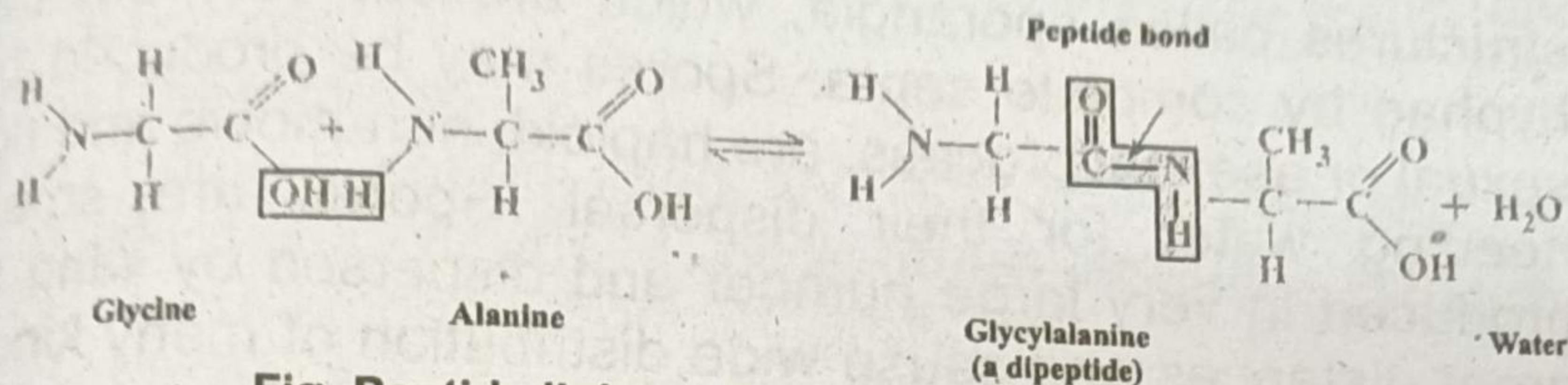


Fig. Peptide linkage-formation of peptide bond.

(ii) Define apoenzyme and prosthetic group.

**Ans** **Apoenzyme:**

An enzyme with its coenzymes, or prosthetic group removed is designed as apoenzyme.

**Prosthetic group:**

If the non-protein part is covalently bonded, it is known as a prosthetic group.

(iii) Differentiate between competitive and non-competitive inhibitors.

**Ans** **Competitive Inhibitors:**

Competitive inhibitors, because of structural similarity with the substrate, may be selected by binding sites. But they are not able to activate the catalytic sites. Thus products are not formed.

**Non-Competitive Inhibitors:**

On the other hand, non-competitive inhibitors form enzyme inhibitor complex at a point other than the active site. They alter the structure of the enzyme in such a way



tissues organized into organs and have intermediate shape.  
3. These are asymmetrical.

tissues organized into organs and organ systems.

3. These include radially (grade radiata) and bilaterally (grade bilateria) animals.

(viii) **What is archaeopteryx? Give its two characters.**

**Ans** **Archaeopteryx:**

Archaeopteryx is a genus of bird-like dinosaurs that is transitional between non-avian feathered dinosaurs and modern birds.

**Two Characters:**

1. Body is stream-lined and spindle-shaped with four divisions, viz; head, neck, trunk and tail. These are warm-blooded (homeothermic).
2. Limbs are adapted for flying. The fore-limbs are modified into wings and hind-limbs for perching and in some birds for running as in ostrich.

(ix) **Give two examples of sponges.**

**Ans** Following are two example of sponges:

1. Calcareous Sponges
2. Glass Sponges

(x) **Differentiate between polyps and medusae.**

**Ans** The polyps are sessile, or non-motile, organism; well-known solitary polyps are the sea anemone and the freshwater hydra. The medusae, when free swimming, is popularly known as a jellyfish.

(xi) **Define photosynthesis. Write its equation.**

**Ans** Photosynthesis can be defined as the process in which energy-poor inorganic oxidised compounds of carbon (*i.e.*,  $\text{CO}_2$ ) and hydrogen (*i.e.*, mainly water) are reduced to energy-rich carbohydrate (*i.e.*, sugar-glucose) using the light energy that is absorbed and converted into chemical energy by chlorophyll and some other photosynthetic pigments.



that even if genuine substrate binds the active site, catalysis fails to take place.

(iv) Differentiate between pepsin and pepsinogen.

**Ans** Pepsin is the active form of pepsinogen that hydrolyzes proteins during the digestion process. While pepsinogen is an inactive proenzyme which is used to form pepsin for digestion of proteins.

(v) What are conidia and spores?

**Ans** Spores:

Spores are produced inside the reproductive structures called sporangia, which are cut out from the hyphae by complete septa. Spores may be produced by sexual or asexual process, are haploid, non-motile and not needing water for their dispersal. Spores are small, produced in very large number and dispersed by wind to great distances and cause wide distribution of many kinds of fungi.

**Conidia:**

Conidia are non-motile, asexual spores which are cut off at the end of modified hyphae called conidiophores, and not inside the sporangia, usually in chains or clusters. These may be produced in very large number, can survive for weeks and cause rapid colonization of new food.

(vi) Differentiate between plasmogamy and karyogamy.

**Ans** Karyogamy is the fusion of nuclei, while Plasmogamy is the fusion of cytoplasm. Karyogamy does not take place immediately after the Plasmogamy.

(vii) Differentiate between parazoa and eumetazoa.

**Ans**

### Parazoa

1. The simplest of the animals belong to subkingdom Parazoa (Phylum Porifera).

2. These animals lack

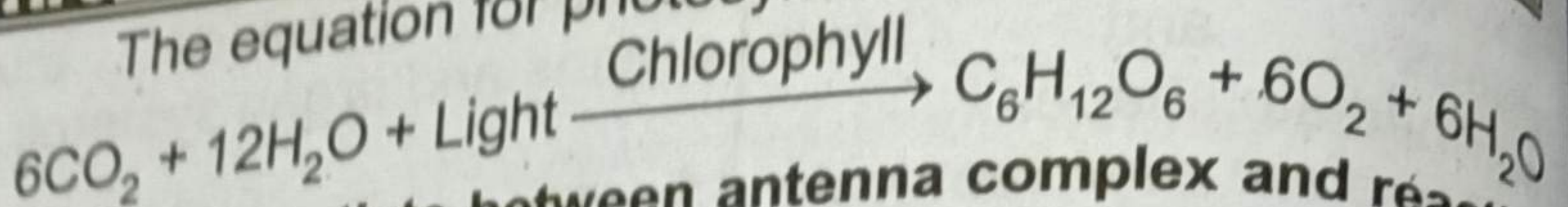
### Eumetazoa

1. The subkingdom Eumetazoa includes animals of other phyla.

2. These animals have



The equation for photosynthesis is:



- (xii) Differentiate between antenna complex and reaction center.

**Ans** An antenna complex of protein molecules found in the thylakoid membrane of chloroplasts that captures and transfers light energy to the photochemical reaction center. While, a reaction center is a complex of several proteins, pigments and other co-factors that together execute the primary energy conversion reactions of photosynthesis.

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

16

- (i) Differentiate between inductive and deductive reasoning.

**Ans** Deductive reasoning:

Deductive reasoning moves from the general to the specific. It involves drawing specific conclusion from some general principle / assumptions. Deductive logic of "if ..... then" is frequently used to frame testable hypothesis.

**Inductive Reasoning:**

The other way of reasoning used in the formulation of hypothesis is inductive reasoning, which is reasoning from the specific to the general. It begins with specific observations, and leads to the formation of general principle.

- (ii) Define phyletic lineage.

**Ans** A phyletic lineage is an unbroken series of species arranged in ancestor to descendant sequence with each later species having evolved from one that immediately preceded it.

- (iii) Give chemical composition of primary and secondary cell wall.

**Ans** Primary Cell Wall:



The primary cell wall is composed of cellulose and some deposition of pectin and hemicelluloses. Cellulose molecules are arranged in a criss-cross arrangement. The primary wall is a true wall and develops in newly growing cells.

### Secondary Cell Wall:

The secondary cell wall is formed on its inner surface and is comparatively thick and rigid. Chemically, it is composed of inorganic salts, silica, waxes, cutin, lignin, etc.

(iv) **What are microfilaments? Give their functions.**

**Ans** These are considerably more slender cylinders made up of contractile actin protein, linked to the inner surface of the plasma membrane. They are involved in internal cell motion.

(v) **How ciliates differ from other protozoans?**

**Ans** Ciliates differ from other protozoans in having two kinds of nuclei.

(vi) **What are choanoflagellates?**

**Ans** Choanoflagellates are sessile marine or freshwater flagellates which are attached by a stalk and their single flagellum is surrounded by a delictate collar.

(vii) **Write down two characteristics of apicomplexans.**

**Ans** Following are two characteristics of apicomplexans:

1. Apicomplexans are a large phylum of parasitic alveolates.
2. The organelle is an adaptation that the apicomplexan applies in penetration of a host cell.

(viii) **What do you know about giant amoeba?**

**Ans** The giant amoeba *pelomyxa palustris* may be the most primitive of all eukaryote like forms.

Giant amoebas obtain energy from methanogenic bacteria, which reside inside them. Moreover, the giant amoeba has multiple membrane bound nuclei. These are found in the mud at the bottom of freshwater ponds.



(ix) Differentiate between bryophytes and tracheophytes.

**Ans** Tracheophytes are vascular plants, while bryophytes are non-vascular plants. Tracheophytes have tissues with lignin for conducting water (called xylem). While bryophytes are all land plants that lack vascular tissues with lignin, the three main groups being mosses, liverworts and hornworts.

(x) Define double fertilization.

**Ans** Double fertilization is a special process found in angiosperms. In this, two male gametes fuse with two cells. Simultaneously, a gamete ( $n$ ) fuses with egg ( $n$ ) to form a diploid zygote ( $2n$ ) which develops later on into an embryo and second male gamete fuses with another female cell resulting into a triploid ( $3n$ ) endosperm cell, which develops into food storing endosperm tissues. Double fertilization helps the plant to economize its food resources.

(xi) Differentiate between plasmolysis and deplasmolysis.

**Ans** Plasmolysis can be defined as "the shrinkage of protoplast due to exosmosis of water. When a living cell is placed in a solution having lower water potential than that of the cell, plasmolysis takes place" and the cell is called plasmolysed.

If this plasmolysed cell is placed in distilled water (which has highest water potential), the water molecules would move from distilled water through differentially permeable cell membrane into the cell, and the cell would become deplasmolysed.

(xii) What are blue babies?

**Ans** Failure of interatrial foramen (an opening in the interatrial septum) to close or of ducts arteriosus to fully constrict results in cyanosis (blueness of skin) of new born. This is due to mixing of blood between two atria and the



mixed blood is supplied to the body of the newborn babies resulting in blueness of skin; thus the name blue babies.

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

(i) What are prions?

**Ans** The term "prion" is derived from proteinacious infectious particle and refers to the pathogen that causes transmissible spongiform encephalopathies (TSEs). These small infectious particles are disease-causing form of a protein called cellular prion protein (PrPc).

(ii) Differentiate between tetrad and sarcina.

**Ans** Tetrad is a four-part structure that forms during the prophase of meiosis and consists of two homologous chromosomes, each composed of two sister chromatids. While sarcina is a genus of bacteria found in various organic fluids, especially in those of the stomach, associated with certain diseases.

(iii) Define dyspepsia and also mention its characteristics.

**Ans** **Dyspepsia:**

Incomplete or imperfect digestion is called dyspepsia. This is not a disease in itself but symptomatic of other disorders or diseases.

**Characteristics:**

This is characterized by abdominal discomfort, flactulence, heartburn, nausea and vomiting. These symptoms may occur irregularly and in different patterns from time to time. Dyspepsia may occur due to excessive acidity in stomach or faulty function of stomach and intestine or insufficient quality or quantity of bile secretions.

(iv) Differentiate between appendix and appendicitis.

**Ans** The appendix is a blind-ended tube connected to the cecum, from which it develops in the embryo. While appendicitis is an inflammation of the appendix.



(v) How trypsinogen is activated?

**Ans** Trypsinogen is activated by enteropeptidase, which is found in the intestinal mucosa, to form trypsin. Once activated, the trypsin can activate more trypsinogen into trypsin.

(vi) What are spiracles?

**Ans** Spiracle is an external respiratory opening, especially each of a number of pores on the body of an insect, or each of a pair of vestigial gill slits behind the eye of a cartilaginous fish.

(vii) Enlist types of respiration in frog.

**Ans** Here are such types of respiration in frog:

1. Cutaneous respiration
2. Pulmonary respiration

(viii) What is respiratory distress syndrome?

**Ans** Respiratory distress syndrome is a breathing disorder that affects newborns. The distress is more common in premature infants born about 6 weeks or more before their due dates.

(ix) What changes occur in diving reflex?

**Ans** Three main changes occur in the body in diving reflex:

1. Bradycardia
2. Peripheral vasoconstriction
3. Blood shift

## SECTION-II

**NOTE: Attempt any Three (3) questions.**

**Q.5.(a) Discuss Biology in the service of mankind in field of disease control. (4)**

**Ans** There has been fantastic progress in the area of health and disease control. Three pronged actions are usually taken against various diseases.

1. Preventive measures
2. Vaccination / Immunization
3. Drug treatment / Gene therapy



### 1. Preventive measures:

The advances in biological sciences have provided us information about the causative agents of the diseases and their mode of transmission. For instance, the AIDS (Acquired Immune Deficiency Syndrome) is caused by HIV (human immuno deficiency virus) and it spreads through free sexual contact, through blood transfusion, by using contaminated syringes or surgical instruments etc. Therefore, doctors advise us to take precautions on these fronts so that we do not contract the disease, which is at present incurable.

### 2. Vaccination / Immunization:

Many diseases such as polio, whooping cough, measles, mumps, etc. can easily be controlled by vaccination or "shots".

Edward Jenner first developed the technique of vaccination in 1796, Cowpox pus is known as vacca. From this word evolved the present term vaccination and vaccine.

Since then, inoculation or vaccination is carried out to make the people immune from viral or bacterial epidemics or, for some diseases the individuals are vaccinated in their early life to make them immune to those diseases.

### 3. Drug treatment / Gene therapy:

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 administering certain anticancer 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.

**(b) Soil water moves and reaches to xylem tissues by various pathways. Explain. (4)**

**Ans** Following are the paths taken by water to reach the xylem tissue:

**(i) The apoplast pathway:**

It is the pathway involving system of adjacent cell walls which is continuous throughout the plant roots. In the roots, apoplast pathway becomes discontinuous in the endodermis due to the presence of casparian strips.

**(ii) The Symplast pathway:**

It is the system of interconnected protoplasts in the root cells. The cytoplasm of neighbouring cells (Protoplasts) is connected with one another by Plasmodesmata which are cytoplasmic strands that extend through pores in adjacent cell walls. In the cells of root, the cell membrane and cytoplasm (and plasmodesmata) can be regarded as acting together as one partially permeable membrane.

**(iii) The vacuolar pathway:**

In this pathway, water moves from vacuole to vacuole through neighbouring cells crossing the symplast and apoplast in the process and moving through cell membranes by osmosis. Water moves passively down a concentration gradient.

**Q.6.(a) Explain polysaccharides with examples. (4)**

**Ans** Polysaccharides:

Polysaccharides are the most complex and the most abundant carbohydrates in nature. They are usually



branched and tasteless. They are formed by several monosaccharide units linked by glycosidic bonds. Polysaccharides have high molecular weights and are only sparingly soluble in water. Some biologically important polysaccharides are starch, glycogen, cellulose, dextrans, agar, pectin and chitin.

**Starch:**

It is found in fruits, grains, seeds and tuber. It is the main source of carbohydrates for animals. On hydrolysis, it yield glucose molecules. Starches are of two types: amylose and amylopectin. Amylose starches have unbranched chain of glucose and are soluble in hot water. Amylopectin starches have branched chains and are insoluble in hot or cold water. Starches give blue colour with iodine.

**Glycogen:**

It is also called animal starch. It is the chief form of carbohydrate stored in animal body. It is found in liver and muscles, through found in all animal cells. It is insoluble in water, and gives red colour with iodine. It also yield glucose on hydrolysis.

**Cellulose:**

It is the most abundant carbohydrate in nature. Cotton is the pure form of cellulose. It is the main constituent of cell walls of plant and is highly insoluble in water. On hydrolysis, it also yields glucose molecules. It is not digested in the human digestive tract. In the herbivores, it is digested because of microorganisms in their digestive tract. These microorganisms secrete an enzyme called cellulase for its digestion. Cellulose give no colour with iodine.

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(b) Describe digestion in hydra.

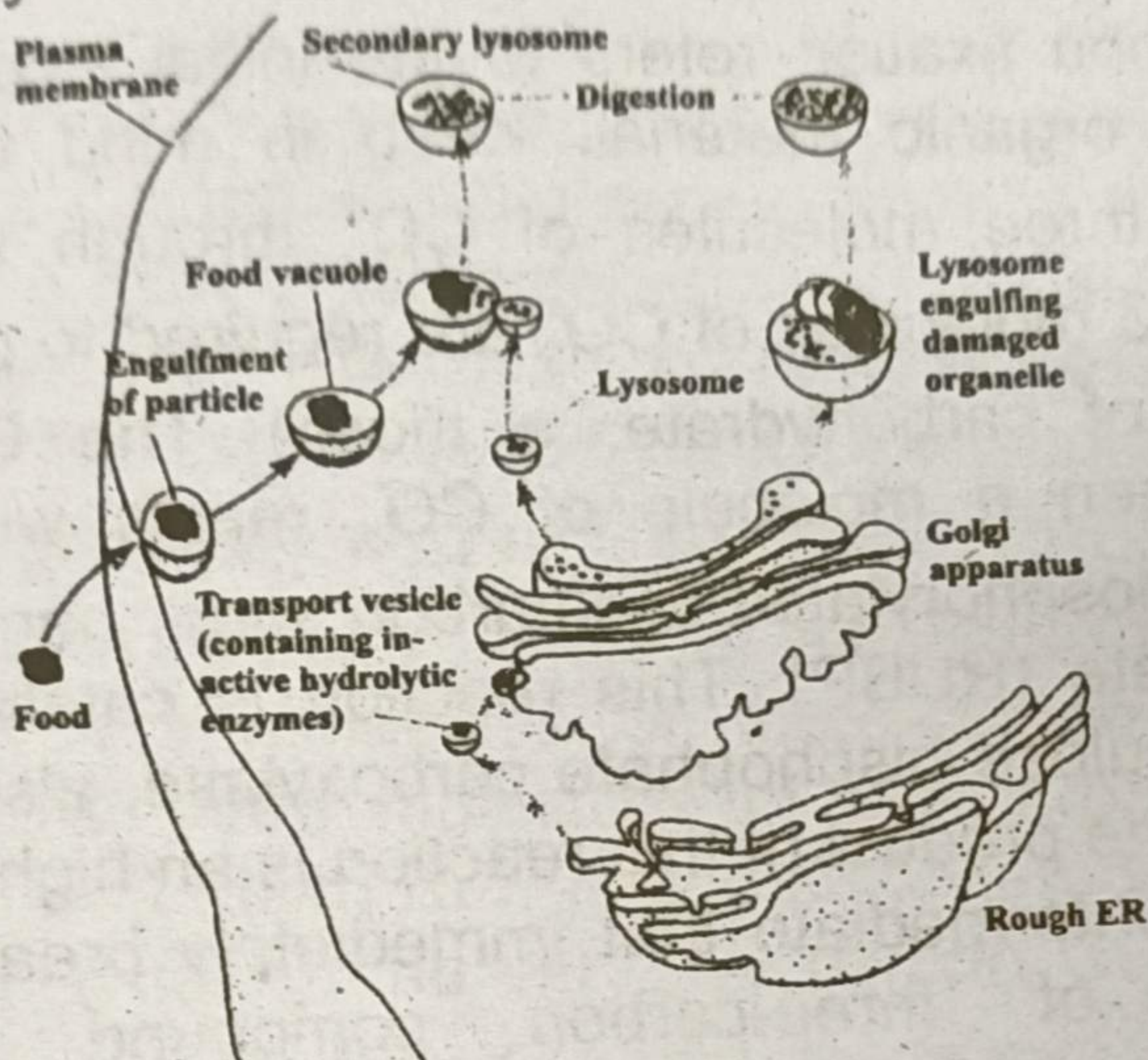
(4)

**Ans** Digestion in Hydra:

Hydra is an aquatic, diploblastic cnidarian. It has vase-like body composed of two principal layers of cells. The central cavity of the body functions as a digestive



rough endoplasmic reticulum. These enzymes are taken to Golgi apparatus where they are further processed and budded off as Golgi vesicles. These vesicles are called Primary lysosomes. When primary lysosomes fuse with food vacuole, they digest the food particles and become residual body or secondary lysosomes (autophagosomes).



### Functions:

1. **Phagocytosis:** Any foreign object that gains entry into the cell is engulfed by lysosomes and is broken into simple digestible pieces. This process is called phagocytosis.
2. **Intracellular digestion:** They are involved in intracellular digestion, since they have enzymes to digest the phagocytosed food particles.
3. **Extra-cellular digestion:** They also help in extra-cellular digestion by releasing enzymes.
4. **Autophagy:** It is the process by which old, worn out parts of cell, such as old mitochondria are digested. Thus, materials of cell may be recycled and cell may be renewed.
5. **Degeneration of cell:** The enzymes of lysosomes can also result in degeneration of cell, as may occur during some developmental processes e.g., metamorphosis.



cavity. The animal has only one opening to the outside called mouth which is surrounded by mobile tentacles. The digestive cavity of this sort is called gastrovascular cavity or coelenteron.

Embedded in the tentacles are numerous stinging cells called nematocysts. Each nematocyst consists of a hollow thread coiled within a capsule and a tiny hair-like trigger, projecting outside.

When a prey such as Daphnia or Cyclops comes in contact with the cnidocil, the hollow thread of the nematocyst turns inside out, ejects poison and the prey is paralysed or some times killed. Hydra then grasps its prey with its tentacles and pushes it into the digestive cavity through open mouth.

The glandular cells in the gastrodermis secrete enzymes which start extracellular digestion. Gastrodermal flagellate cells and contraction of body cavity help in mixing food with enzymes and breaking up into fine particles. These fine particles are then engulfed by phagocytic action of gastrodermal cells where digestion is completed intracellularly in the digestive vacuoles. Indigestible food is expelled out from the gastrovascular cavity via mouth. Such a digestive system is called sac-like digestive system having a common opening for ingestion and egestion.

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**Q.7.(a) Explain the structure and functions of lysosomes. (4)**

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**Ans** Lysosomes:

"They are cytoplasmic organelles, bounded by a single membrane and are simple sacs."

**Structure:**

They are found in most eukaryotic cells. They are rich in acid phosphatases and hydrolytic enzymes. Lysosomes are often derived from vesicles of Golgi apparatus. The enzymes are made on ribosomes on



(b) Write a note on Calvin Cycle.

**Ans** The Calvin cycle can be divided into three phases: Carbon fixation, Reduction, and Regeneration of  $\text{CO}_2$  acceptor (RUBP).

**Phase I: Carbon fixation:**

Carbon fixation refers to the initial incorporation of  $\text{CO}_2$  into organic material. Keep in mind that we are following three molecules of  $\text{CO}_2$  through the reaction (because 3 molecules of  $\text{CO}_2$  are required to produce one molecule of carbohydrate, a triose). The Calvin cycle begins when a molecule of  $\text{CO}_2$  reacts with a highly reactive phosphorylated five-carbon sugar named ribulose biphosphate (RUBP). This reaction is catalyzed by the enzyme ribulose biphosphate carboxylase, also known as Rubisco. The product of this reaction is an highly unstable, six-carbon intermediate that immediately breaks into two molecules of three-carbon compound called 3-phosphoglycerate. The carbon that was originally part of  $\text{CO}_2$  molecule is now a part of an organic molecule; the carbon has been "fixed". Because the product of initial carbon fixation is a three-carbon compound, the Calvin cycle is also known as  $\text{C}_3$  pathway.

**Phase 2: Reduction:**

Each molecule of (PGA) receives an additional phosphate from ATP of light reaction, forming 1,3-bisphosphoglycerate as the product. 1,3-bisphosphoglycerate is reduced to glyceraldehyde 3-phosphate (G3P) by receiving a pair of electrons donated from NADPH of light reactions. G3P is the same three-carbon sugar which is formed in glycolysis (first phase of cellular respiration) by the splitting of glucose. In this way, fixed carbon is reduced to energy rich G3P with the energy and reducing power of ATP and NADPH (both the products of light-dependent reactions), having the energy stored in it.



Actually G3P, and not glucose, is the carbohydrate produced directly from the Calvin cycle. For every three molecules of  $\text{CO}_2$  entering the cycle and combining with 3 molecules of five-carbon RuBP, six molecules of G3P (containing 18 carbon in all) are produced. But only one molecule of G3P can be counted as a net gain of carbohydrate. Out of every six molecules of G3P formed, only one molecule leaves the cycle to be used by the plant for making glucose, sucrose starch or other carbohydrates, and other organic compounds. The other five molecules are recycled to regenerate the three molecules of five-carbon RuBP, the  $\text{CO}_2$  acceptor.

### Phase 3: Regeneration of $\text{CO}_2$ acceptor, RuBP:

Through a complex series of reactions, the carbon skeletons of five molecules of three-carbon G3P are rearranged into three molecules of five-carbon ribulose phosphate (RuP). Each RuP is phosphorylated to ribulose biphosphate (RuBP), the very five-carbon  $\text{CO}_2$  acceptor with which the cycle started. Again, three more molecules of ATP of light reactions are used for this phosphorylation of three RuP molecules. These RuBP are now prepared to receive  $\text{CO}_2$  again, and the cycle continues.

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**Q.8.(a) Explain lytic cycle of bacteriophage. (4)**

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#### **Ans** Lytic Cycle of Bacteriophage:

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. Many animal viruses, however, enter the host cell as a whole.

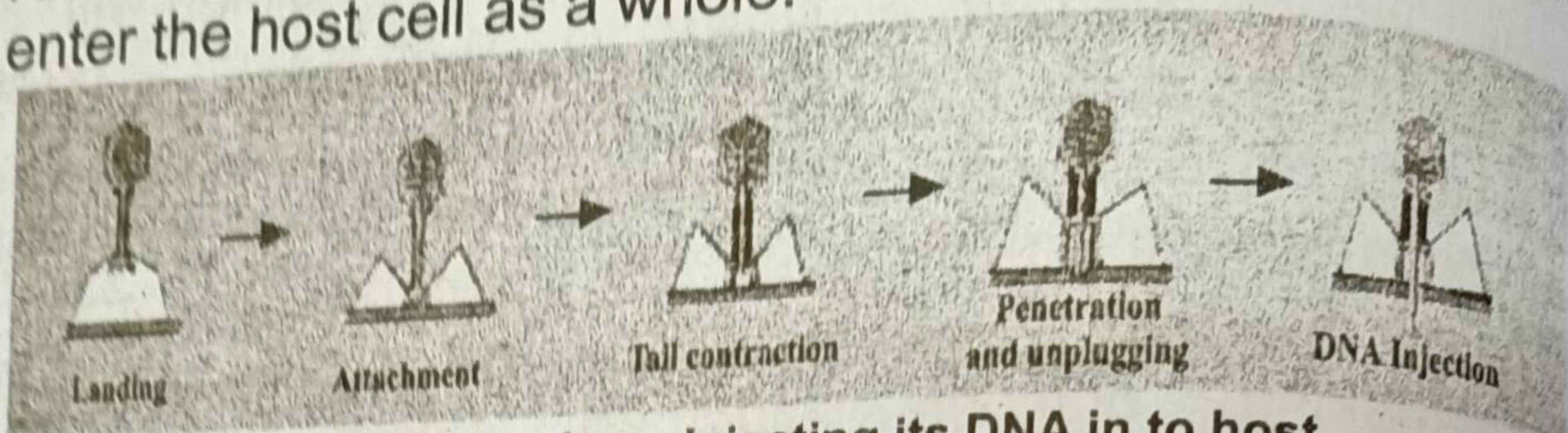


Fig. A phage injecting its DNA in to host.

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*.

(b) Write a note on lycopsida.

(4)

**Ans** **Lycopsida:**

The plants of Lycopsida have sporophytes differentiated into roots, stem and true leaves. The leaves are small and single-veined, they are also called microphylls. The arrangement of leaves is spiral or opposite. The sporangia develop singly on the upper side of the sporophylls, which may or may not be arranged to form strobili.

The sporophyte may have sporangia of one kind as in Lycopodium or of two kinds *i.e.*, microsporangia and megasporangia as in Selaginella.

Lycopsids are also called club mosses/spike mosses because of their club/spike-shaped strobili and small leaves resembling mosses. On the basis of types of



spores produced in the sporophyte, they are thus referred to as being 'homosporous' or 'heterosporous' respectively. This condition is called homospory and heterospory. Selaginella resembles seed producing plants (spermatophytes) because of its heterosporic condition and some other characters. The gametophyte of Lycopsidea is mainly underground.

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**Q.9.(a) Discuss the use and misuse of antibiotics. (4)**

**Ans** Use and Misuse of Antibiotics:

Antibiotics is a Greek word Anti-against and Bio-life. Antibiotics are the chemotherapeutic chemical substances which are used in treatment of infectious disease. Antibiotics are synthesized and secreted by certain bacteria, actinomycetes and fungi. Today, some antibiotics are synthesized in the laboratory. However, their origins are living cells. To determine drug of choice, one must know its mode of action, possible adverse side effects, in the human beings.

Massive quantities of antibiotics are being prepared and used, which are following by the widespread problems of drugs resistance in microorganism. This result in an increasing resistance against disease treatment. Misused antibiotics can interact with the human metabolism and in severe case can cause death of human beings. Misuse of antibiotic such as penicillin can cause allergic reactions. Similarly, streptomycin can affect auditory nerve thus causing deafness. Tetracycline and its related compounds cause permanent discoloration of teeth in young children.

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**(b) Describe different methods of asexual reproduction found in fungi. (4)**

**Ans** For Answer see Paper 2016 (Group-I), Q.7.(b).