Chapter 1

Biology and its major field

A. Fill in the Blanks

1. According to Robert Wbitter classification living organisms are grouped into **5** kingdoms.
2. The branch of biology that deals with the organisms living in the sea and ocean is called **Marine biology.**
3. Similar organisms that can interbreed and produce fertile off springs form a **species.**
4. The sequence or arrangements of species from ancestor to descendents through their evolution I known as **phylatic lineage**.
5. The disease like **cancer** is treated by chemotherapy.
6. Production of genetically identical copies of plants and animals is called **cloning.**
7. An immuno biological substance that produces specific, protection against a certain disease is called **vaccine.**
8. Hydroponics is also called **soilless** or water culture.
9. Biological control is a method by which plants and animal's **pathogens** are controlled by their natural enemies.

B. Tick (√) the statement if it is true and cross (ξ) if it is false. Rewrite the false statement after correcting it.

1. According to five-kingdom classification, these kingdoms are plantae, animalia, fungi, protista, monera.√
2. Biotechnology deals with physio and chemical organization of living matter, and the molecular basis of inheritance and protein synthesis (Molecular Biology) **X**
3. The elements that are needed by the living organisms in a very minute quantity are called trace elements. √
4. The elements upon which all the organic compounds are based is nitrogen. (Carbon). **X**
5. Members of the same species living together in a particular area constitute a population.√
6. Healthy calls can also be harmed by chemotherapy.√
7. The sheep dolly was the 1st cloned mammal.√
8. Live attenuated vaccine is used to prevent a person from cholera. (Inactive or killed vaccine).**X**
9. Hydroponics techniques can be used to introduce and develop new better varieties.√
10. Rapidly cutting down of forests results in disturbing the oxygen / carbon dioxide balance in nature.√
11. Crop rotation is one of the methods of controlling most of the plant pathogen.√

C. Choose the correct option form each statement and encircle it in double.

1. Five kingdoms classification was proposed by
   (a) Robert Brown **(b) Robert Whittaker** (c) Lynn Margules (d) Carolus Linnaeus
2. The branch of biology that deals with the organisms like bacteria virus etc, is
   (a) Molecular Biology **(b) Micro Biology** (c) Environmental Biology (d) Marine Biology
3. Which one of the following is an inorganic compound
   (a) Sugar (b) DNA **(c) Carbon dioxide** (d) Protein
4. The correct sequence of biological organization from simple to complex is
   (a) Cell→ Tissue→ System→ Organ→ Organism
   (b) Tissue→ Cell → Organs→ Systems→Organisms
   (c) Cells→ Tissues→ Organs→ Systems→ Organisms
   (d) Cells→ Organs→Tissues→ Systems→ Organisms

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5. The presence of bacteria which existed three billion years ago on earth was discovered by

   (a) Barghoon and Schopt (b) Robert Wittaker (c) Lynn Magulis and Karlen Schwartz (d) Robert Brown
6. In ancient times the cause of malaria was thought to be
   (a) Drinking of dirty water **(b) Inhaling of bad air** (c) Sleeping in open places (d) from biting of Mosquitoes.
7. Combination chemo therapy is
   (a) Different methods of Chemotherapy combined together.
   (b) **More than one cancer drug us used at a time**.
   (c) More than one kind of cancer is treated
   (d) More than one patient is treated at a time.
8. Somatic cell is represted by
   (a) An eggell (b) A sperm cell (c) A zygote **(d) Body cell**
9. All of the following happened during the dolly's cloning except.
   (a) DNA of two-parent cvere combined.
   (b) Nucleus of donor was transferred from its somatic cell.
   (c) The nucleus of recipient egg was removed.
   (d) Used methods involving somatic cell nucleus
10. to prevent from all of the following diseases killed vaccine is administered Except.
   (a) Typhoid (b) Measles (c) Cholera (d) Plague

D. Write the short answers.

Q 1. Define the following.

(a) Marine Biology: The scientific study of living organisms, living in sea and oceans.

(b) Molecular Biology: The study of those molecules, which make the body of living organisms e.g.

Protein, DNA, RNA, Carbohydrates, Lipids, Enzymes etc.

(c) Human biology: The study of all biological aspects of man including anatomy, physiology, inheritance, evolution etc.

A. Fill in the blanks.

1. **Ecology** is the study of organisms in relation to their environment.
2. The study of organisms living in fresh water bodies like rivers, lakes, etc is called **fresh water biology.**
3. **Social biology** is the branch of biology, which deals with the study of social.
4. In the **human** body only six bio-elements account for 99% of the total mass.
5. All living and non-living things are formed of simple units called **atoms** and subatomic particles.
6. Various organs in plants and various organ systems in animals are assembled together to from **an organism.**
7. **Population** is a group of organisms of the same species located in the same place at the same time.
8. **A hypothesis** is based upon observations.
9. A hypothesis is a result of deductive reasoning or its can be the consequence of inductive.

B. Write whether the statement is true or false; write the correct statement if it is false.

1. Penicillin was discovered by Edward Jenner from fungus penicillin. **(F)**
2. Many diseases such as polio, whooping cough, measles, mumps etc. can easily be controlled by Antibodies. **(F)**
3. Exposure to cow pox, virus allow the body to develop immunity against small poxvirus. **(F)**

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4. Aids is caused by HN, and it spreads through sexual contacts, blood transfusion by contaminated syringe or surgical instruments. **(T)**

C. Each question has four options. Double encircle the correct answer.

1. Which one of the following is a correct sequence in biological methods. .
   (a) Observation → Hypothesis → Law → Theory
   (b) Observation → Hypothesis → Deduction → Testing
   (c) Hypothesis → Observation → Dedication → Testing
   (d) Law → Theory → Dedication → Observation

2. Which one of the following is employed in treatment of cancer?
   (a) Antibiotics and Vaccination
   (b) Radiotherapy and chemotherapy
   (c) Chemotherapy and antibodies
   (d) All of the above

3. Which one of the following is not a viral disease
   (a) cowpox
   (b) Mumps
   (c) Tetanus
   (d) Small pox

4. Which of the is not related to cloning
   (a) Replacement of the nucleus of zygote by another nucleus of the same organisms.
   (b) Separation of cells of embryo to form more embryos.
   (c) The did individual resulting have similar genetic make up.
   (d) Removal of piece of DNA or genes form the cell and in carporating another gene or.

"Short Questions"

D. Short Answer Questions.

Q 1. What do you mean by hypothesis?

Ans. A statement or opinion of a scientist based on background knowledge and experience and still not confirm by experimentation.

Q 2. How does law differ from theory?

Ans. Theory is not a uniform and constant fact or principle of nature, therefore it may or may not survive after critical testing by many scientists and is changed or modified. The same theory become a scientific law if it is repeatedly tested, by many scientist and it continue to survive as constant fact of nature and dos not change or modify.

Q 3. What is deductive reasoning?

Ans. Drawing conclusion from general to specific, e.g. all birds have feel the general statements. Since sparrows are birds therefore, it will have wings. It differ from inductive reasoning in which

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conclusions are drawn from specific to general e.g. sparrows have wings and are birds then eagle, parrot etc are birds with wings, therefore we induce that all birds have wings.

Q 4. Define vaccination?

Ans. Increasing body immunity by introduction substances, which when introduced in the body produces certain antibodies against that particular pathogen. Active vaccines are introduced in living but attenuated form e.g. BCG, Measles, yellow fever etc. while inactive or passive vaccines are introduced in dead form e.g. cholera, HBV, meningitis etc.

E. Write the short answers.

Q 1. What are different levels of biological organization?

Ans. Deferent levels of biological organization are sub-atomic particles→Atoms→Molecules→organelles →Cells→Tissues→organs→system→organism's→species→population→communities→Ecosystem → Biosphere.

Q 2. Write the name of six elements that are present in almost all the living organisms.

Ans. Six elements which make about 99% of the humans body and mot living organisms are (1) Nitrogen, (2) Hydrogen, (3) oxygen, (4) carbon, (5) calcium, (6) phosphorus.

Q 3. What do you know abut cloning?

Ans. The technology of producing genetically identical plants and animals is known as cloning. A clone is a cell or individual and all its asexually produced offspring's. All members of a clone are genetically identical; therefore cloning is used for obtaining eugenic organism i.e. organisms of the same genetic make up. Cloning is adopted for commercial production of animals & plants.

F. Additional important points.

Phylatic lineage: The unbroken continuity between present day organisms and organisms of the remote past or evolutionary link of present day → organisms with the organisms of the emote past.
Eugenic organisms: Genetically similar organisms.
Transgenic organisms: Genetically modified organism.
Integrated disease management is the control of disease in using all possible methods, by involving the whole community in it.

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Chapter 2

"Unity of life (Biological molecules)"

A. Fill in the blanks.

1. Higher plants obtain **inorganic** compounds like carbon dioxide, water etc from their environment.
2. Ionic and non-ionic but polar substances are **soluble** in water
3. The process through which two simple sugar molecules combine to form compounds sugar with the removal of water molecule is call **condensation.**
4. Glucose, galctose, and fructose has the same **molecular** formula but are different in their structure.
5. Amino acids consist of an amino group, **carboxyl** group alpha carbon and alongside chain.
6. The bonds by which amino acids building blocks are bonded together are called **peptide** bonds.
7. The most common fibrous protein found in hairs fur, nail, claws etc is **keratin.**
8. Carbohydrates are classified into monosaccharides **olgosaccharides** and polysaccharides.
9. The animal starch is called **glycogen.**
10. Fats is synthesized by the covalent bonding of f three, fatty acids chains to one molecule of **glycerol.**
11. Adenine and guanine are known as **purines.**
12. The RNA molecule that carry instructions from the DNA gone to the site of protein synthesis in the cell are called **messanger RNA**
13. The example of mononucleotide, which has 3 phosphate groups, is **atp.**
14. Any time when a co-enzyme like NAD is **reduced** it become more active.
15. The process through RNA is synthesized is known as **transcription**.
16. When molecules of two different groups join together they form **conjugated** molecules.
17. RNA acts as carrier of **information.**
18. The four nitrogenous bases in RNA molecules are adenine, guanine, cytosine and **Uracil.**

B. Tick (√) if the statement is correct and cross (X) if it is false. Correct the false statement and rewrite it.

1. Plants depend upon readymade food obtained from animals. χ (Animal-Plants)
2. Condensation is a process in which large organic molecules are synthesized and involve the addition of Water. χ (Removal of water)
3. Carbon has the covalent bonding capacity of four. √
4. Starch is a common storage product in animals and glycogen in plants. χ (Plants-Animal)
5. The amino acids bond together by peptide bonds. √
6. The example of fibrous protein molecule is keratin and globular protein is hemoglobin. √
7. Waxes have powerful water absorbing property √
8. Vegetable oils and animal fats are called Triglycerides. √
9. Total number of nitrogenous bases present in both DNA and RNA are 4. χ (5)
10. RNA has nitrogenous base uracil instead of adenine. χ (Thynine)
11. There are three types of nucleotides, mononucleotides dinucleotides and polynucleotide. √
12. Nicotine amide adenine dinucleotide is a co-enzyme. √
13. RNA acts as carrier of information.

C. Choose the correct option f each statement and double encircle it.

1. The structure which is formed from the monosaccharide when in solution form is
   (a) Branched (b) Un-branched **(c) Ringed** (d) all
2. The most abundant carbohydrate in nature is.
   (a) Pectin (b) glycogen **(c) cellulose** (d) chitin
3. The main component of cellular membrane is

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(a) Lipid (b) cellulose (c) carbohydrate **(d) protein**

4.

5. the kind of amino acids which are involved in the synthesis of most proteins are.
   (a) 20 (b) 30 (c) 40 (d) 60
6. amino acids mainly differ from each other by the difference in their.
   (a) R-Group (b) Carboxyl group (c) amino group (d) alpha group
7. the 1st scientist who discovered the sequence of amino acids in a protein molecule was
   (a) W.S Sutton (b) pasture **(c) F. Sanger** (d) beadle
8. keratin is a type of protein found in
   (a) Silk fibers **(b) nails** (c) blood cells (d) muscle cells

D. Match the substances in Column A with their characteristics in column B, and write. It in column.

	A	B	C
1	DNA	A) CO-ENZYME	1→D
2	RNA	B) FRUCTOSE	2→E
3	NAD	C) OLIGOSACCHARRIDE	3→A
4	HEXOSES	D) HEREDITARY METRIAL	4→B
5	KERATIN	E) CARRIED OF INFORMATION	5→F
6	MALTOSE	F) FIBROUS PROTEIN	6→C

E. Write Short Answers.

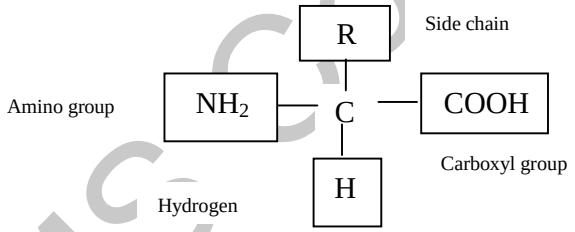
Q 1. Define (a) condensation (b) Hydrolysis.

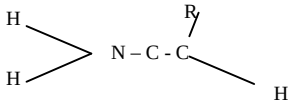
Ans. **(a)** Condensation: is a process in which small simple molecules are joining together to form large complex molecules with the liberation / removal of water molecule.

(b) Hydrolysis: is a process in which large and complex molecules are broken into small and simple molecules with addition of water.

Q 2. Write the names of different compounds of which and amino acid is composed of.

Ans.





The above structures show different parts of an amino acid, which are (1) an amino group (2) carboxyl group (3) A variable side chain. (4) a hydrogen.

All these four groups are attached to the same carbon called alpha carbon. There are 20 different types of amino acids in nature, which differ from one another in the attachment of their R-group or side chain. The rest of the three components remain unchanged. The amino acid joins through peptide bonds to form proteins. These proteins differ in size, shape and function due to the difference in numbers. Kinds and arrangement of amino acids.

Q3. Write about five different functions of proteins.

Ans. Proteins play divers roles in the body which are as under.

(1) Structural role: - they are the major components of various body parts of living organisms e.g. skin, nails mussels etc in animals and seed, fruits etc in plants

(2) Catalytic role: - many enzymes are globular proteins which speed up body metabolism, while some hormones like insulin and glycogen are proteins in nature which carry out sugar metabolisms.

(3) **Hemoglobin's** are oxygen carrier proteins.

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(4) **Actine and myosin** present in the mussels are use for contraction and relaxation which bring body movement.

(5) **Antibodies** are proteins which defend the body from pathogens, while fibrinogens are blood clotting proteins.

Q 5. Differentiate between saturated and unsaturated fatty acids.

Ans. R-e-oH represents a fatty acid. Those fatty acid which contain no double bond are called saturated, fatty acid while those fatty acids which contain one or more double bonds in their chain are called non-saturated fatty acids.
Saturated fatty acids ore mostly found in animals while non-saturated fatty acids are fond in plants as oil.

Q 6. Write the names of nitrogenous bases presents in both DNA and RNA.

Ans. Four bases are found in DNA and RNA, two of which are purines, and two are pyrimidines. Purines found in DNA are **(1)** adenine **(2)** guanines, while pryimidines found in DNA are **(3)** thymine and **(4)** cytosine's. In RNA uracil is found instead of thymine, while the rest of 3 bases remain the same.

Q 7. What are different kinds of RNA? Write at least one function of each.

Ans. There are three kinds of RNA **(1) Messenger RNA (2) Transfer RNA (3) Ribosomal** RNA. All these three type of RNA are synthesized in the nucleus from DNA by transcription.
(1) Messenger RNA: it contains the genetic information in the form of codons. There information carried from the nucleus to the ribosome's in cytoplasm.
(2) Transfer RNA: it contains antic-dons, which catches the amino acids and bring it to the Messenger RNA on ribosome.
(3) Ribosomal RNA: It forms ribosome which acts as factory for protein synthesis.

A. Fill in the blanks

1. The sum of all the chemical reactions taking place with in a cell is called **metabolism.**
2. **Carbon** is the basic element of organic compounds.
3. All the amino acids have an amino group and a carboxyl group attached to the same **alpha carbon atom**.
4. **Cellulose** is the most abundant carbohydrate in nature.
5. Adenine and guanine are double ringed bases, called **purines**.

B. Write whether the statement is true or false and write the correct statement if it is false.

1. A small proportion of water mole cutes are in ionized form. **"False"** depending upon the condition.
2. Covalent bond among two monosaccharide is called a peptide. Bond. **"False"** Glycosidic bond
3. Glycogen is also called plant starch. "False" Animal starch.
4. Adenine is always opposite to guanine cytosine and thiamine are opposite are opposite to each other in DNA. **"False"** adenine - thymine and guanine – cytosine.
5. DNA molecule is made of two poly nucleotide strands. **"True"**

C. Each question has four options. Double encircle the correct answer.

1. Animals obtain carbohydrate mainly from.
   (a) Glucose **(b) starch** (c) sucrose (d) glycogen
2. Peptide bond is a

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(a) C-N link (b) C-O link (c) N-H link (d) C-H link

3 globular proteins differ from fibrous proteins in
(a) Having amino acids (b) their reapting units joined by peptide bond
(c) being soluble in aqueous medium (d) being non-crystalline.

4. Which of the following kinds of atoms do not occur in carbohydrates?
(a) Carbon (b) Hydrogen **(c) Nitrogen** (d) Oxygen
5. Amino acids are arranged in proper sequence during protein synthesis according to instructions Transcribed.
(a) Transfer RNA (b) Ribosomal RNA (c) Messenger RNA (d) DNA

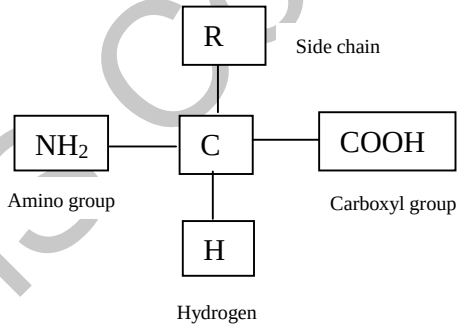
C. Short Questions.

Q 1. Name the carbohydrates suitable as food for man.
Ans. Glucose, fructose, Maltose, Lactose, Starches, and Glycogen. Animals can digest and hydrolyzes. Cellulose, because of cellulose digesting bacteria present in their gut while man can not use cellulose as food. These carbohydrates are present in fruit, cereals, and root tubers can sugar milk and liver of animals.

Q 2. Why are fats considered as high energy compounds?
Ans. Because of higher proportion of C-H bonds and very low proportion of oxygen, lipid store double, the amount of energy as compared to the same amount of any carbohydrate.

Q 3. What is the function of mRNA?
Ans. Messenger RNA carry the genetic information from the DNA present in the nucleus to the ribosome's present in the cytoplasm for the synthesis of proteins by arranging amino acids according to the genetic information or condones present on mRNA or condones present on mRNA.

Q 4. What is the general formula for amino acid?
Ans.



Q 5. What is the percentage of water in brain cells of man?
Ans. The percentage of water in brain cells of man is 85%, 20% in bone cells, 70 % in bacterial and other mammalian cells.

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Chapter No.3

A. Fills in the blanks with suitable words.

1. As a result of interaction between enzyme and its **substrate** product is produced.
2. The complex which is formed by bonding together of enzyme and its substrate is known as **enzyme** substrate complex.
3. The not protein part of the enzyme or cofactor is called prosthetic group or (coenzyme).
4. most of the enzymes ore found dissolved in the **cytoplasm** of the cell
5. The enzymes responsible for taking part in the respiration are found in the **mitochondria** of the cell.
6. The inhibitors that destroy the globular structure of enzymes and completely stop them from functioning are called **irreversible** inhibitors.
7. Enzymes are sensitive to changes in the PH of the **substrate.**
8. Each enzyme has its own **optimum** temperature at which it work at its maximum.
9. The concentration of **enzyme** and substrate affect the rate of enzyme action .

B. Tick (√) if the statement is correct and cross (ξ) if it is false. Correct the false statement and rewrite it.

1. Enzymes are organic catalyst that speed different reactions with in the body of living organisms. (√)
2. The not protein part of an enzyme is co-factor which is called co-enzyme. (√)
3. The enzymes which take part in the process of photo synthesis are mostly dissolved in the cytoplasm of cell. (**X**) Chloroplast.
4. According to induce fit hypothesis the active site of an enzyme is a rigid structure. (**X**) flexible structure
5. A non polar substrate molecules can react very often with there active site of an enzyme.(**X**) can't react.
6. The enzyme resumes its original confirmation after the formation of product. (√)
7. Competitive inhibitors are the substances which are not similar to the normal substrate of enzyme. (**ξ**) which are similar to.
8. Enzymes reduce the activation energy necessary for a reaction like catalyst. (√)
9. Enzymes have an active site to which substrate molecule is bonded. (√)
10. Most of the enzymes perform bets in strongly acidic surroundings. (**X**)
    Few of the enzymes perform best in strongly acidic environments. (√)

C. Choose the correct option f each statement and double encircle it.

1. all of the following are related to enzymes except
   (a) Speed up reaction (b) remain unchanged
   (c) Increase the activation energy (d) Globular protein
2. All of the following refer to the non-protein part of an enzyme
   (a) Cofactor (b) prosthetic group
   (c) Apo-enzyme (d) co-enzyme
3. The enzyme from which the not pertinacious organic molecule is removed is called
   (a) Co-enzyme **(b) Apo-enzyme**
   (c) Hole enzyme (d) Cofactor
4. Induce fit hypothesis related to the structure of enzyme was proposed by
   (a) Email Fishers (b) Karlene Swartz
   (c) Koshland (d) Robert wittaker
5. Some time enzyme and substrate are held together by the kind of bond called
   (a) Ionic bond (b) hydrogen
   (c) Hydrophobic **(d) covalent**
6. Which one of the following refer to the non-competitive inhibitors
   (a) Bind to active site (b) similar to normal substrate

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(c) Destroy the globular conformation of enzyme (d) bind to the bioxting site other than active

7. Which of the following factors does and affect the rate of enzyme action?
   (a) Enzyme concentration (b) light intensity
   (c) Substrate concentration (d) temperature
8. The optimum PH value for pepsin to work is
   (a) 6.8 (b) 5.5
   (c) 4.5 (d) 2

D. matches the enzyme in Column 'A' with their optimum PH value in Column 'B' and writes the correct the answer in Column 'C'.

S.No	Column 'A'	Column 'B'		Column 'C'
1	Catalase	a.	2.0	1 ==> 7.6 C
2	Pepsin	b.	9.0	2 ==> a.2.0
3	Salivary lipase amylase	c.	7.8	3 ==> 6.8 d
4	Sucrase	d.	6.8	4 ==> 4.5 e
5	Pancreatic lipase	f.	4.5	5 ==> b 9.0

E. Write the short answers

Q 1. Define enzyme?

Ans. Globular proteins which speed up biochemical reaction with out charging themselves. They are reaction specific, and dears the activation energy of the reactions.

Q 2. What is co-factor?

Ans. The non-protein organic molecule required for the proper functioning of an enzyme is called, co-factor, or co-enzyme or prosthetic group**. e.g**. vitamins. If the non protein part is covalently bounded to enzymes called prosthetic group and it is loosely bounded to enzyme it is co-enzyme.

Q 3. What are metal activators? Give three examples.

Ans. The inorganic metal ion required for the activation of an enzyme is called metal activation. **e.g.** if differ from co-enzyme in two respects. **(1)** It is inorganic metal ion. **(2)** It is detachable. **e.g. MG^{2+}, zm^{2+} cu^{2+}**

Q 4. define Apo enzyme and Holo enzyme.

Ans. Some enzymes need a non-protein protein part or co-enzyme for their activation. that an enzyme with its co-enzyme removed is called apo enzyme. An apo enzyme activated by a co-enzyme is called Holo enzyme or enzyme in action.

Apo enzyme + co-enzyme ⟶ Holo enzyme
↓ ↓ ↓
Protein non-protein activated enzyme.

Q 5. What do you know by induce fit hypothesis?

Ans. Induce fit hypothesis was propose by kosheland in 1959, for mode of enzyme action. According to this hypothesis, the active site of an enzyme is a flexible structure, and during enzyme substrate complex certain confirmation changes are induced by the substrate in the active site of the enzymes. These changes make the enzyme more reactive to the substrate in making product. After product formation the active site of the enzyme come to its original conformation. The following equation shows the state at which changes occur.

E + S ⟶ ES ⟶ EP ⟶ E+P
↓ ↓

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↓

Enzyme Substrate Confirmation changes occur region it original conformation.

Koshland hypothesis is contrary to Emil Fischer's (1890) hypothesis of lock and key model. while According to induce fit hypothesis the active site is a fixable structure. Certain changes re induced in the active site by the substrate to make reactive.

Q 6. how PH of cell effect the enzyme activity.

Ans. Each enzyme need a particular PH for its proper functioning which depends upon its molecular shape bonding ability of amino acids and substrate any changes in the PH in a cell can change the ionization of amino acids or substrate. Which leads to retort the enzyme activity. Some time enzyme active are completely blocked. While extreme changes in the PH may lead to denaturation of the enzyme causing the bonds in the enzyme to break. e.g. amylase work best in PH around 7 i.e. 6.8, while pepsin work best in PH around 2. any changes in the PH for these enzymes while adversely effect their activity. Most of the enzymes need neutral conditions for the functioning.

Q 7. how enzyme concentration and substrate concentration effect enzyme activity.

Ans. Small amount of the enzyme are required for large amount of the substrate because enzyme are used over and over again. By increasing enzyme. Concentration, the rate for the reaction could be increased provided there is sufficient substrate available. In case the substrate is in short supply the increase I enzyme concentration will not effect the rate of the reaction. Substrate concentration does effect the rat of the reaction if it is a limiting factor. In such a case an increase in substrate concentration ill increase the rate of the reaction in the presence of the sufficient enzymes. When all the active sites of the enzymes are occupied with substrate, then further increase in the substrate concentration will have no effect on the rate of reaction

A. Fill in the blanks.

1. Enzymes are composed of hundreds of **Amino acids**
2. Some enzyme consists of a non-protein part known as **co-enzyme, co-factor** or **prosthetic group.**
3. Many enzymes require not non protein components called **co-enzyme** for their proper functioning.
4. Enzymes are highly **specific** in nature.
5. The enzymes which carry out the synthesis of **proteins** are integral part of ribosome.

B. Write whether the statement is true or false and write the correct statement if it is false.

1. The enzymes important in photosynthesis are found in mitochondria. **(X)** chloroplast
2. Large amount of an enzyme can accelerate a chemical reaction. **(X)** small amount.
3. Calvin Melvin proposed lock and key model for enzyme action. **(X)** Emil Fischer 1890.
4. The active site of an enzyme is composed of four regions. **(X)** two regions, a binding site catalytic site.
5. Structure of an enzyme has no specific importance. **(X)** structure of an enzyme has a specific importance

C. Each question has four answers . Double encircle it.

1. If more substrata to an already enzymatic reaction is added more enzymatic activity is seen because.
   (a) There is probably more substrate present than there is enzyme.
   (b) There is probably more enzyme available than there is substrate.
   (c) There is probably more product present then there is either substrate or enzyme.
   (d) The enzyme substrate complex is probably feeling to from during the reaction.

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2. if you ad more substrate to already occurring enzymatic reaction and it has no effect on the rate of reaction? What is the form or name given to this situation?
   (a) Saturation (b) Denaturation (c) Composition (d) Inhibition

3. The rate of an enzyme catalyzed reaction
   (a) Is constant under all condition (b) Decrease as substrate concentration increase
   (c) Cannot be measured **(d) can be reduced by inhibitor.**

4. The active site of an enzyme.
   (a) Never changes (b) form no chemical bond with substrate
   (c) Determines by its structure the specificity of the enzyme
   (d) Look like a lump projecting from the surface of an enzyme.

5. Which statement about enzyme is not true?
   (a) They consist of proteins with or with out a non protein with or with out a not-protein part.
   (b) They change the rate of catalyzed reaction.
   (c) They are sensitive to heat.
   (d) They are not-specific in their action.

D. Short Question.

Q 1. List two conditions that destroy enzymatic activity by disrupting bonds between the atoms in a enzyme.

Ans. Extreme changes in the PH and very high temperature destroy enzymatic activity by disrupting bond between the atoms in an enzyme and the enzyme.

Q 2. What is a prosthetic group?

Ans. A non-protein port covalently bonded to the enzyme needed for activation of an enzyme is called a prosthetic group, or cofactor. If the cofactor is loosely attached to the enzyme it is called co-enzyme. A detachable cofactor is activator if it is in-organic ion.

Q 3. Define inhibitors of enzyme.

Ans. Chemical substances which can react (in place of substrates) with the enzyme and is not transformed in to product and thus block the active site temporarily or permanently e.g. cyanide, antibiotics or some drugs. Those inhibitors which block the active site permanently and destroy the globular conformation of enzymes are called irreversible inhibitor while those which inhibit enzyme action temporarily and do not destroy the globular conformation of enzyme are called reversible inhibitors. Reversible inhibitors may be competitive inhibitors of the temporary occupy the active product while non-competitive inhibitor get attach to a any site other than active site (Allosteric site) and inhibit enzymatic action

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Chapter 4

A. Fill in the blanks with suitable words.

1. Robert Hooke published his findings when he examined the cork cell under microscope in his publication named **Micrographic.**
2. The first step of fractionation is to grind the tissue in a liquid medium of proper **osmotic** concentration to form a homogenate.
3. The organisms which are composed of eukaryotic cells are called eukaryotes.
4. All kinds of cell are bounded by **cell / plasma** membrane.
5. Proteins in plasma membrane which are confined to the suffice are called **extrinsic** proteins.
6. The secondary call wall is composed of a succession of compact layers called **secondary layers.**
7. The inner membrane of mitochondrion has many inwardly directed folds called microvillus or **cristae.**
8. The grane and lamellae of chloroplast are embedded in its **stroma.**
9. The colorless plastids are called **leucoplasts.**
10. Fixation of carbon dioxide occurs in **stroma** of chloroplast.
11. Glyoxysomes are absent in seeds poor in **lipids.**
12. Microtubules were first seen in the **spindles** of dividing cell.
13. Membrane enclosed fluid filled space present in almost all plant cells are called **vacuoles.**
14. The largest and most conspicuous organelle found in all plant cell is **nucleus.**

B. Tick (√) the statement if it is true and cross (X) if it is false. Rewrite the false statement after correcting it.

1. Magnification is a means of increasing the apparent size of the object being viewed to a reasonable. √
2. schlerenchymea is a kind of tissue which store different substance. X
3. The nuclear region in prokaryotic cell is called nucleoid. √
4. Fluid mosaic model of plasma membrane is world wide accepted today. √
5. Cell recognizes one another on the basis of carbohydrates and proteins of the membrane.
6. Cell wall is semi permeable and allows only selective substance to pass through. X cell membrane
7. Endoplasmic reticulum is composed of membrane enclosed fluid filled space**.** √
8. Enzymes that are involved in lipid synthesis are structural component of rough endoplasmic reticulum. X
   Smooth endoplasmic reticulum.
9. Lysosomes act as the digestive system of a cell through phagocytosis or pinocytosis. √
10. The role of cellular respiration played by chloroplast. X Mitochondria.
11. Leucoplasts are basically concerned with storage of food material. √
12. Peroisomes are most common in live and kidney cells. √
13. Glyoxysomes are concerned with conversion of carbohydrates into fatty acids. X Fatty acid in to carbohydrates.
14. Microfilaments are arranged parallel to each other in skeletal muscles. √
15. Centrioles are absent from most of the higher animals. X Absent from higher plants.

C. Choose the correct option f each statement and double encircle it.

1. A light microscope cam magnify a specimen up to
   (a) 10,000 times (b) 12,000 times (c) 14,000 times (d) 15,000 times

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2. The magnification power of transmission electron microscope is up to.

   (a) 1000 times (b) 10,000 times (c) 100000 times **(d) 1,000,000 times.**

3. The cell theory is credited to
   (a) Robert Hooke & Robert Brown **(b) the odor Schwann & Schleiden**
   (c) Waldyer and S.J Singer (d) Dedue and Galileo.

4. Number of DNA molecule / molecules in the nucleod of a bacterium is
   (a) 1 **(b) 12** (c) 3 (d) 4

5. the most prominent cell organdle of abacterial call other than DNA is
   (a) Mesosome **(b) Ribosome** (c) Lysosomes (d) Nucleosome

6. The cell wal of prokaryotic cell is composed of
   (a) Pectin (b) Lignin (c) cellulose **(d) Murein**

7. The cell orandle in eukaryotic cell which is not bounded by membrane.
   (a) Lysosome **(b) centriale** (c) Peroxisomes (d) Mitochondrion

8. The structure which is present both in prokaryotic and eukaryotic cell is
   (a) Chromosome (b) Mitochondria (c) Microtubules (d) Nuclear membrane

9. Eukaryotic cell differ rent of prokaryotic cell in all of the following except
   (a) Chlorophyll scattered in cytoplasm **(b) Presence of ribosome**
   (c) Golgi apparatus (d) in structure and contents of cell wall.

10. The cell organelle which is present in animal cell but not in plant cell is
    (a) Plastids (b) centiole (c) lysosomes (d) Nucleolus

11. The special proteins which carry lipid in soluble large molecules through pores of plasma membrane are called
    (a) Permeases (b) catalases (c) arginases (d) amylases

12. The membrane enclosed space of endoplasmic reticuluma are called
    (a) lamellac **(b) cisternae** (c) stroma (d) cristae

13. All of the following refer to lysosomes except
    (a) Slightly larger than mitochondria (b) roughly spherical
    (c) Single membrane bounded (d) contain powerful digestive enzyme

14. lysosomes are some time called
    (a) peroxisomes (b) mesosomes **(c) phagosomes** (d) glyoxysomes

15. in the leaves of green plants peroxismes are the site of
    (a) Respiration (b) Photosynthesis (c) photorespiration (d) phototropism

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D. matches the enzyme in Column 'A' with their optimum PH value in Column 'B' and writes the correct the answer in Column 'C'.

S.No	Column 'A'	Column 'B'	Column 'C'
1	Smoothes endoplasmic Reticulum	a. store secretory products	1 'd' detoxify man of kinds poison
2	Golgi Apparatus	b. cause old cell death	2 'a' store secretory products
3	Lysosomes	c. involved in food storage	3 'b' cause old cell death
4	Mitochondrion	d. detoxify man of kinds poison	4 'g' involved in cellular respiration
5	Leucoplast	e. convert fatty acids to carbohydrates	5'c' involved in food storage
6	Glyoxsomes	f. involved in protein synthesis	6 'e' convert fatty acids to carbohydrates
		g. involved in cellular respiration	

Q 3. Write the name of deferent compounds of which an amino acid is composed of.

Ans.

The above structures show different components and parts of an amino acid. They are, (1) An Amino group, (2) Carboxyl group, (3) A variable side chain represented by R, (4) a Hydrogen atom, all these four parts are attached with the same carbon called Alpha Carbon. There are 20 deferent types of Amino acids in nature which differ in their R-group i.e. side chain. The rest of the acid three components remain the same. These amino join together through peptide bonds to form various kinds of proteins which differ both in size and shape due to difference in number and arrangement of amino acids.

Q 4. Write about five different functions of proteins.

Ans. Proteins play diverse role in the body which is a follow:

(1) Structural Role: they make major part of the body of living organisms. They are the major component of various parts of living organisms. e.g. skin, hair, nail, in animals and in fruit and seeds of plants.

(2) Catalytic Role: Almost all of the enzymes are globular proteins body metabolism which some hormones like insulin are protein which carry out sugar metabolism.

(3) Hemoglobin: Hemoglobin is oxygen carrier protein.

(4) Fibrinogen: Fibrinogen is blood clotting protein.

(5) Antibodies are protein which depend our body against the germs.

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E. Write the short answer the following questions.

Q 1. Describe the function of nucleus.

Ans. Nucleus is one of the important organelle of a cell which contains the hereditary material in the form of chromosomes. These chromosomes contain DNA, which bear the genetic

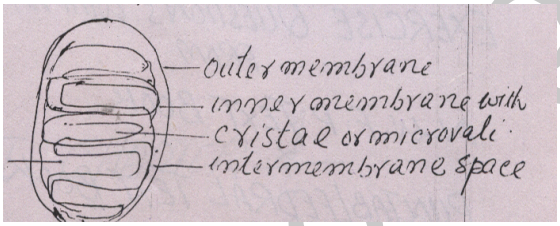
information and control all the activities of a cell like reproduction, development metabolism and the behavior of a cell. More over the nucleoli present in the nucleus play role in synthesis of ribosomal components. The nucleoplasms present in the nucleus provide an amorphous, granular material, in which chromosomes and nucleoli are embedded. All the nuclear material i.e. chromosomes a double membrane called nuclear envelop provide with pores. The nucleus communicates and control all the activities of a cell in the cytoplasm the rough these prose.

Q 2. What do you know about paroxysms?

Ans. Paroxysm's are small, single membrane cytoplasm organelle found in both plans and animal cells. They are also called micro bodies and contain many enzyme including peroxide's and catalyses etc. they are mainly involved in the decomposition of H202 in to H20 and o, which protect the cell from the toxic and corrosive effect of Hydrogen peroxide (H2o2). In plants they are involved in photorespiration.

Q 3. Draw a labeled diagram of Mitochondrion?

Ans.



Mitochondrion is a double membrane rod shaped or oval organelle concerned with cellular respiration. The outer membrane is smooth and inner membrane is folded forming chamber like extension in the matrix called cristae. The electron transport chain occurs in the cristac while Krebs cycle occurs in the matrix of mitochondrion. Both are steps of cellular respiration for the synthesis of ATP. It is also called powerful house cell.

Q 4. Write two difference between Rough endoplasmic reticulum and smooth endoplasmic reticulum.

Ans. (1) Endoplasmic reticulum are net work of membrane enclosed fluid filled spaces, which are with attached ribosome in case of RER and with out ribosome in case of SER.

(2) Rough Endoplasmic reticulum is involved in protein synthesis because of its attached ribosome while SER are involved in lipid synthesis and detoxification of drugs.

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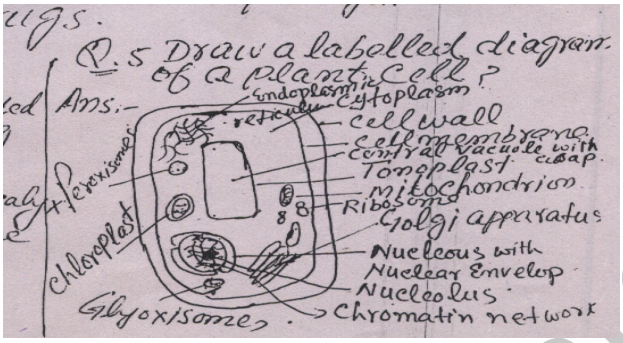
Q 5. What is Glycoclyx?

Ans. The cell membrane with carbohydrate covalently bound to protein or lipid forming Glyco protein or Glycolipid respectively is called Glycochyx. There for a glycocalyx may be Glyco protein in nature or Glycolipid in nature.



A. Fills in the Blanks.

1. In eukaryotic cell chromatin material is bounds by **Nuclear membrane** also called Nuclear envelop.
2. A group of ribosome attaché to mRNA is known as **poly some.**
3. **Contromere** is the place on chromosomes where spindle fibers are attaché during cell division.
4. The endoplasmic reticulum with attaché ribosome's is known as **Rough Endoplasmic reticulum**
5. The soluble part of cytoplasm is called **cytosol.**

B. Write whether the statement is true or false. Write the correct statement if it is false.

1. Cell membrane is present in all eukaryotic cells. √
2. Chloroplast and mitochondria do not have hereditary material. √
3. Centriole is involved in cell secretion. **X** (Golgibodies are involved in cell secretion)
4. Some time may ribosomes get attaché to the same stretch of mRNA forming a structure called cytosome. X (Polysomes)
5. Mitochondria is very important organelle of the eukaryotic cell. √

C. Each question hast four option double encircle in the correct answer.

1. **Which statement about the nuclear envelope is not true.**
   (a) It has prose (b) It is a double membrane structure
   (c) Its inner membrane bears ribosome (d) RNA and some protein pass through it.

2. **Which statement about plastids is true?**
   (a) They are surrounded by a single membrane (b) They are the power house of a cell
   (c) They are found in all organisms **(d) they contain DNA and ribosome.**

3. **which type of cell would probably be most appropriate to study lysomes?**

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(a) Phagocytic white blood cell (b) Nerve cells.
(c) Mesophyll cell of leaf (d) Muscle cell

4. **which of the following structure function is mismatched?**
(a) Ribosome's: protein synthesis (b) Nucleolus: Ribosome production
(c) Golgi: Muscle contraction (d) Lysosome: intra cellular digestion

5. **which of the following statement about ribosome is correct?**
(a) They are structurally different from free ribosomes
(b) they are enclosed in their own membrane.
(c) They are concentrated in the cisternal space of rougher.
(d) They are attached to cisternal surface.

D. Short Question.

Q 1. Describe various movements involved in the transport of the material across the cell membrane.

Ans. Cell membrane is semi permeable and allow only selective substance to pass through. Large molecules have difficulty in their movement to cross the membrane while small neutral molecules like water, gas, glucose, etc. the membrane easily charge ions also have difficulty to cross the membrane. Those substance which are lipid soluble cross the membrane easily then other. All these movements comes under two categories. **(1) Passive (2) Active**.
(1) In passive transport the material cross the membrane from its high concentration to tis low concentration without the use of ATP. **(2)** In active transport the material move across a membrane against concentration gradient with the use of energy.
In certain animal cells the cell membrane help the transport of the food material by enfolding to form vacuole and cross the membrane as food vacuole. This in take the material by the membrane is called endocytosis. Which may phagochtosisi i.e. engulfing solid particles or pinocytosis i.e. engulfing liquid particles. In addition to the transport of the material cell membrane in nerve cells also transport impulses from one part of the body to the other which help in coordination.

Q 2. State various structural modification in a cell involved secretion.

Ans. The structure of a cell is modified according to the function it perform. The cells which are involved in secretion are abundantly provided with secretory organelles called Golgi apparatus. The direction of flow of the secretion is form synthesis of protein by ribosome in RER and its transport in RER to Golgi apparatus in transport vesicle from forming face to maturating face of golgi-bodies, and then transport of secretions from the golgi-bodies vesicles either to cell membrane for sending it out side cell for extra cellular digestion or making primary lysosomes for intra cellular digestion.

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Q 3. List the processes blocked by mitochondrial failure.

Ans. Mitochondrion is involved in two main steps of cellular respiration called Krebs cycle and electron transport chain. Both these steps provided the necessary energy to all the life process of a cell, the failure of mitochondria block. The supply for cell metabolism which leads to the total failure of cell activities like respiration photosynthesis growth, movement, excretion, digestion secretion reproduction, responding to external stimuli active transport etc.

Q 4. What will happen if a chromosome looses tic Centro-mere.

Ans. The chromosomes get attached themselves to the spindles by their Centro-mere, which are then drawn towards opposite poles during cell division. If a chromosome looses its Centro-mere it will fail to get attached to the spindles resulting in its failure to reach opposite pole during cell division.

Q 5. How does auto-phagy help in converting tadpole larvae in to an adult amphibian?

Ans. Tadpole have a tail which is degenerated in the adult stage due to accumulation of lysosomes in their tail. These lysomes carry out auto phagy or and tail disappear in the adult stage.

Q 6. Is there any similarity between bacterial and plant cell wall.

Ans. No. there is no chemical or morphological similarity in bacterial and plant cell well or bacterial and plant cell wall differ in their chemical composition and morphological arrangement of these chemical. Bacterial cell wall is made of Murein or peptidoglycan which consists of polysaccharide bonded to amino acid forming a whole composite structure while in plants cell wall is made up of mainly cell wall fibers arranged in a crises cross arrangement, not filled with matrix. If contain pectin's which bind the fibers and adjoining cell. Secondary and tertiary wall differ chemical in being made of lignin a mainly giving it strength.

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Chapter 5

"Biodiversity"

A. Fill in the blanks with suitable words.

1. The multi-cellular eukaryotes with no cell wall and no chlorophyll included in kingdom **Animalia.**
2. The unicellular prokaryotes like bacteria and blue green.
3. tracheophyta are divided into spermatophyte and **pteridophta.**
4. Tiger is **felis Tigris**, cat is **felis domestica** and lion is **felis leo.**
5. The life cycle in which the phage becomes a harmless guest and bacteria as a host is known as **lysogenic.**
6. The life cycle of the phage in which the bacterial cell burst is called **lytic.**
7. The virus containing DNA in the head and parasite only on bacteria is termed as **Bacteriophage.**
8. The head of the virus consists of DNA which is enveloped in a protective coat of protein called **capsid.**
9. Viruses have no cytoplasm and can be crystallized; there fore they are **non-living.**
10. Viruses posse's nucleic acids and have the ability to reproduce and grow. So they are **living.**

B. Write whether the statement is true or false. Write the correct statement if it is false.

1.Presence of cell wall chlorophyll and ability to prepare food are the characters of kingdom Animalia.**X** (Plantae)
2.Fungi posses no chlorophyll and bryophytes posses no vascular tissues. √
3.A group of alike individual that interbreed and produce fertile offspring's is the species. √
4.Classification is bases on homologous structure showing common ancestors.√
5.Closely related genera are grouped in the same species. **X** (Family)
6.Animals are bodies organized having life and sensation but no locomotion. **X** (Plants)
7.Gymnosperms are the floevering plants in which the seed lie inside the fruit. **X** (Angiosperms)
8.Algae are green multi-cellular decomposers, possessing their cell wall.X (Fungi, non-green)
9.Mustard, Cabbage, Cauli flower and turnip are included in the genous Brassica. √
10. Bryophyta and Tracheophyt are included in the sub kingdom embryophyta. √

C. Each question hast four option double encircle in the correct answer.

1. the lower vascular plants are included in a group called
   (a) Brophyta (b) Angiosperm **(c) Pteridophyta** (d) Gymnosperm
2. In angiosperms the seeds are
   (a) Absent (b) naked **(c) inside the fruit** (d) None of them
3. Euglena lips in kingdom
   (a) Fungi (b) Monera **(c) Protista** (d) None of them
4. Example of spherical virus
   (a) Polio virus (b) Bacterial virus (c) Tobacco mosaic virus (d) None of them
5. The virus which contain only DNA in its head is
   (a) Plant virus (b) Animal virus **(c) Bacterial virus** (d) Both a & b
6. The virulent cycle or master slave relation is also known as
   (a) Lysogenic cycle **(b) Lytic cycle** (c) Both of them (d) None of them

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D. Match the name of the scientist in Column 'A' with their contribution in Column 'B' and write the correct answer in Column 'C'.

S.No	Column 'A'	Column 'B'		Column 'C'
1	W.M.Stainly	a.	Classified organism into two great kingdom	**1-> d** Isolated TMV form host cell
2	Iwanowsky	b.	Classified plant	**2-> f** Discovered virus
3	Robert Wittaker	c.	Classified Animals	**3-> g** Introduced 5 kingdom system of classification
4	Margulis	d.	Isolated TMV form host cell	**4-> h** Modified 5 kingdom system of classification
5	E-chatton	e.	Gave concept of specie	**5->i** Suggested the term prokaryote and eukaryotes
6	Ernst Hackle	f.	Discovered virus	**6-> j** Proposed a third kingdom protista
7	Linnaeus	g.	Introduced 5 kingdom system of classification	**7-> a** Classified organism into two great kingdom
8	Theorphrastus	h.	Modified 5 kingdom system of classification	**8-> b** Classified plant
9	Robert Wittaker	i.	Suggested the term prokaryote and eukaryotes	**9-> j** Proposed a third kingdom protista
10	Aristtle	j.	Proposed a third kingdom protista	**10-> c** Classified Animals

E. Write short answers.

Q 1. Define biodiversity and classification.

Ans. **Biodiversity** is defined as a wide range of variety of living organisms found in this world. This diversity among the living organisms is due to variations in their structures, and functions ranging from simple unicellular microscopic form to multi-cellular complex forms. These organized variation leads to biodiversity and beauty of this biosphere.

Classification is defined as arrangement of organisms in to groups and subgroups on the basis of similarities and difference in their structure in order to identify and study them easily. Homologous structure i.e. similarity in their structure is the basis for classification.

Q 2. What is the need of biological classification?

Ans. The living organisms on the earth are increasing day by day and about 2.5 millions has been identified so for. More over them differ from each other in their morphology and physiology. However there is some resemblance in them. It is very difficult to study them easily until they are organized in a sequence and arrange them in groups and subgroups. Biological classification is arrangement of organisms into groups and differences between them. It is very important for the purpose of identification, and understanding relationships among these living organisms and to study them easily.

Q 3. Define species.

Ans. Species is defined as similar organisms which freely interbreed and produce fertile off springs species is the smallest unit of classification and individuals of the same species are reproduction isolated from other groups of organisms.

Q 4. Write name of 5 kingdoms of classifications.

Ans. According to Robert Whittaker 1969. the five kingdoms are

(1) Monera **(2)** Protista **(3)** Plantae **(4)** Fungi **(5)** Animalia

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According to Margulies 1988, the modified five kingdoms system is as under.

(1) Prokaryotae or Monera **(2)** Protoctista or Protista **(3)** Plantae **(4)** Animalia **(5)** Fungi

Q 5. Are viruses living? Give reasons.

Ans. **(1)** Virus posses Nucleic acids which are capable of replications which leads to reproduce or increase in number of virus.

(2) DNA is capable of mutation and recombination on due to which they show variation.

(3) They infect a living host and show irritability in short viruses are living because of possession of nucleic acid and are capable of replication mutation recombination reproduction and infecting a living host, showing sensitivity to external, stimuli, while they are inside a host.

Q 6. How can you prove viruses are non-living?

Ans. The viruses has been isolated in the from of crystals from a living body. This was for the 1st time that W.M Stanley in 1935. Isolated TMV from tobacco Plant as crystals. More over a virus show all non-living characters outside its host i.e. it fail to replicate or reproduce while out side a living host.

Q 7. Give structure of Bacteria phage.

Ans. Bacteria phage is tadpole like in shape with ahead and a tail made of protein coat called capsid. Enclosing DNA in its head part.

A. Fill in the blanks

1. Carolus Linnaeus divide all known forms of life into tow kingdoms **plantae** and **animalia**. Bacteria were placed in the kingdom **plantae** because they have cell walls and protozoa were place in the kingdom **animalia** because the move from place to place and ingest food.
2. The most common system of classification used today, developed in 1969, by Robert Whittaker of conell university sued five kingdoms; **(1)** Monera **(2)** Protista **(3)** Plantae **(4)** Fungi **(5)** Animalia
3. Whittaker's five Kingdoms system of classification recognizes two basic types of cell i.e. **prokaryotic** and Eukaryotic.
4. In five kingdom of classification proposed by Margulies and Schwartz organelles of symbiotic origin such as, Mitochondria and chloroplast were considered.
5. A bacteria phage reproduces by using the reproductive machinery of Bacterium.
6. The protein coat that encloses the viral genome is called **capsid**. It is made up of **capsomeres.**
7. Retroviruses are RNA viruses which have specific convert RNA to DNA. It is made up of **capsomeres.**
8. HIV infects **T-Lymphocytes** or **T-cells,** and the defects in these cell lead to failure in immune or **immunity** or **defence** system.
9. Hepatitis is caused by **virus, toxic, agents or drugs.**
10. Viral hepatics are of 2 types. Hepatitis A and C are caused by **RNA** virus where as DNA virus is the causative agent of Hepatitis – B.

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B. Each question has four options. Double encircle the correct.

1. The enzyme involved in viral replication are synthesize
   (a) On the viral ribosome (b) on the interior surface of viral membrane
   (c) By the host cell (d) on the interior surface of viral coat.
2. A virion is a
   (a) Virus (b) Viral protein (c) Viral lysozyme (d) viral gen.

3. An isolated virus is not considered living since it.
   (a) Separates into two inert parts **(b)** cannot metabolize
   (c) Rapidly looses its genome chemically inert (d) is coated writhen air tight shield.

4. In the lytic cycle of a bacteria-phage the host DNA is
   (a) Replicated (b) tuned off by a protein coat
   (c) Digested into its nucleotide (d) turned on by removal of a protein coat.
5. In the lysogenic cycle the DNA of a bacteria-phage
   (a) Joins the bacterial chromosome (b) attaches to the inner surface of the host membrane
   (c) Is immediately degraded when it enters the host. (d) Goes directly to the host ribosome for translation

6. Temperate phage may exists as
   (a) prophage (b) capsid (c) viroid (d) retrovirus.

7. Phylogeny describes a species
   (a) Morphological similarities with other species **(b) Evolutionary history**
   (c) Reproductive compatibility with other species (d) geographical distribution

8. In the binomial system of taxonomy, developed during the 18th century by C. Linnaeus the 1st word of and organisms name (e.g. Homo-Sapiens) is its
   (a) Species **(b) Genus** (c) Race (d) family

9. In the five kingdom system of classification developed by Robert Whittaker, members of the kingdom plantae are
   (a) Multi-cellular (b) Motile
   (c) Either unicellular or multi cellular (d) have sescual reproduction

10. Five Kingdome system of classification proposed by Margulis and Schwartz is not base on
    (a) Genetics (b) Cellular organization **(c) Nucleic acid** (d) mode of nutrition

11. The common name of Allium cepa is
    (a) Piyaz (b) Bathu (c) Amal Las (d) Chana

12. Arrange the following in order of increasing group size beginning with the smallest. Family, Kingdom, Species, Phylum (or division) Genus order and class
    (a) Species (b) Genus (c) Family (d) order (e) class (f) phylum or division (g) Kingdom

13. Pigs are reservoirs to
    (a) Hepatitis A, (b) Hepatitis B. (c) Hepatitis C (d) Hepatitis D **(e) Hepatitis E**

14. Which one of the following is false about AIDS
    (a) HIV (b) Auto-immune deficiency syndrome (c) T-Lymphocytes **(d) HAV** (e) Host specific

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