skull that protects the brain and neural
l cranium. Skull comprises of cranium
s.

**ain components of human nervous
are:**

ntral nervous tem (B) Peripheral nervous system
tonomic vous system (D) All these

y Answer: (D)

us system is centralized nervous
be classified into central nervous
consisting of brain and spinal cord that
processes information and initiates
eral nervous system (PNS) comprises
motor neurons which transmits signals
and rest of the body; and autonomic
made of motor nervous that control
sponses by influencing organs, glands,
uscles.

**many meninges cover the human
?**

ree (B) One
vo (D) Four

y Answer: (A)

spinal cord are covered with 3-layered
between these layers cerebrospinal fluid
sent. It is similar to blood plasma in
and protects the brain and spinal cord
s and jolts.

**ease characterized by decline in brain
tion and whose symptoms are similar
ose diseases (memory loss). Also there
idence that high levels of aluminum
contribute to onset of this disease.**

arkinson's disease (B) Epilepsy
lzheimer's disease (D)

TEST NO.13

1. **How many endocrine glands/tissues are present in man?**

(A) 15 (B) 20
(C) 25 (D) 22

Explanatory Answer: (A)

Endocrine system consists of 20 endocrine glands/tissues lying in different parts of the body.

2. **One of the followings is not the function of hormones.**

(A) Affect target cells (B) Initiate new biochemical reactions
(C) Regulate chemical reactions (D) All of these

Explanatory Answer: (B)

Hormones do not initiate new biochemical reactions but produce their effect by regulating enzymatic and other chemical reactions already present.

3. **Part of the forebrain where many sensory stimuli of nervous system are converted into hormonal response.**

(A) Pituitary (B) Hypothalamus
(C) Hippocampus (D) Pituitary

Explanatory Answer: (B)

Hypothalamus is part of forebrain that produce oxytocin and antidiuretic hormone (ADH) which travel down the nerves to the posterior lobe of the pituitary to be stored.

4. **Sensory stimuli are converted into hormonal responses by which part of brain?**

(A) Fore brain (B) Mid brain
(C) Mind brain (D) Spinal cord

Explanatory Answer: (A)

Hypothalamus part of forebrain converts sensory stimuli into hormonal responses

5. ICSH stimulates the secretion of

(A) Sperms (B) Testosterone
(C) ADH (D) None of above

Explanatory Answer: (B)

ICSH (interstitial cell stimulating hormone) stimulates cells of the testis to secrete testosterone

6. Select the pair that does not match

(A) FSH – Ovulation hormone (B) LH – Leuteinsing hormone
(C) LTH – Latogenic hormone (D) Oxytocin – Milk ejection hormone

Explanatory Answer: (A)

FSH (follicle stimulating hormone) stimulates follicle development and secretion of estrogens from ovaries in females, while in males it stimulates development of the germinal epithelium of the testis and sperm production.

7. Overactivity of parathyroids leads to

(A) Kidney stones (B) Goiter
(C) Myxoederma (D) Grave's disease

Explanatory Answer: (A)

over activity of parathyroids leads to a progressive demineralization of the bones and to formation of massive kidney stones. Underactivity of the glands causes a drop in blood Ca++ ion level which in turn leads to muscular tetany.

8. Over-activity of adrenal cortex results in

(A) Grave's disease (B) Addision's disease
(C) Cushing's disease (D) Alzhemier's disease

Explanatory Answer: (C)

It is a disease where too much cortical hormone is produced. It leads to excessive protein breakdown resulting in muscular and bone weakness. The sugar level increases and disturbs metabolism in diabetics.

9. Select the correctly matched pair

(A) Hypo secretion of insulin – Diabetes insipidus (B) Hypersecretion of insulin – Hypoglycaemia
(C) Hypersecretion of thyroxine – Cushing's disease (D) Hypersecretion of growth hormone – Cretinism

Explanatory Answer: (B)

If excess insulin is produced, the utilization of sugar becomes great and its level in blood falls leading to hypoglycemia which upsets nerve and muscle functioning.

10. Secretion and movements of the alimentary system are regulated by

(A) Gastrin (B) Secretin
(C) Insulin (D) Dopamine

Explanatory Answer: (B)

Secretion is produced from duodenum when acid food touches its lining. It stimulates pancreas to secreted pancreatic juice and also affects the rate of bile production in liver.

11. The destruction of adrenal cortex occurs in

(A) Grave's disease (B) Addison's disease
(C) Cushing's disease (D) Alzheimer's disease

Explanatory Answer: (B)

The destruction of adrenal gland occurs in Addision's disease that leads to general metabolic disturbance in particular weakness of muscle action and loss of salts. The person suffering from disease may collapse and die under stress situations such as cold which normally be overcome.

12. Which pair of hormones exhibits synergistic effect in raising the blood pressure?

(A) Adrenaline and noradrenaline (B) Insulin and glucagon
(C) Gastrin and secretin (D) Estrogen and progesterone

Explanatory Answer: (A)

Both adrenaline and noradrenaline are produced in stress situations. Adrenaline dilates blood vessels in certain parts of the body such as skeletal muscles and increase the heart's output. Noradrenaline constricts blood vessels in certain areas such as the gut. The effect of two hormones is synergistic in raising blood pressure.

TEST NO.14

1. Presence of free oxygen made possible the evolution of.

(A) Photosynthesis (B) Oxidation
(C) Reduction (D) Respiration

Explanatory Answer: (D)

With the emergence of photosynthesis on earth, molecular oxygen began to accumulate slowly in the atmosphere. The presence of free oxygen made possible the evolution of respiration. Respiration releases great deal of energy, and couples some of this energy to the formation of ATP molecules.

2. Oxygen released during photosynthesis comes from.

(A) Water (B) Carbon dioxide
(C) Atmosphere (D) All these

Explanatory Answer: (A)

Oxygen released during photosynthesis come from water. Van Niel hypothesized that plants split water as a source of hydrogen, releasing oxygen as a byproduct. Biel's hypothesis was later confirmed during experiments with isotopic tracer O^{18}.

3. Cavity in which grana are arranged.

(A) Stroma (B) Matrix
(C) Lumen (D) Cisternae

Explanatory Answer: (A)

Each chloroplast has a double membrane envelope that encloses dense fluid filled egoism, the stoma, which contains most of the enzymes required to produce carbohydrate molecules.

4. The process that helps understand principles of transformation.

(A) Photosynthesis (B) Respiration
(C) Anabolism (D) Catabolism

Explanatory Answer: (A)

The process of photosynthesis helps understand some of the principles of energy transformation, i.e., bioenergetics in living system.

5. Cavity of thylakoid is known as.

(A) Matrix (B) Lumen
(C) Cisternae (D) Stroma

Explanatory Answer: (A)

A system of membranes is suspended in the stoma. These membranes from an elaborate interconnected set of flat, disc-like sacs called hyaloids. The thylakoid membrane encloses a fluid-Filled hyracoid interior space in lumen, which is separated from the stoma by thylakoid membrane.

6. Energy stored in carbohydrates is released in controlled manner by.

(A) Glycolysis (B) Krebs cycle
(C) Metabolism (D) Both a and b

Explanatory Answer: (D)

Photosynthesis provides carbohydrate substrate, and the processes of glycofysis and Krebs cycle (anaerobic and aerobic respiration) release the stored energy in controlled manner.

7. What are stacks of thylakoids called?

(A) Stroma (B) Grana
(C) Lamellar hylakoids (D) Grana thylakoids

Explanatory Answer: (B)

In some place within a stroma, the hyaloids sacs are staked in columns called grana (sing: granum) chloroplasts and other photosynthetic pigments are embedded in the hyracoid membranes and impart green color to the plant.

8. Chemiosmosis is a process of.

(A) Osmosis (B) Formation of ATP in mitochondria
(C) ATP formation in chloroplast (D) ATP Formation in cytoplasm

Explanatory Answer: (C)

Electron acceptors of photosynthetic electron transport chain are present on hyracoid membranes. Therefore, these are also involved in ATP synthesis by a process called chemiosmosis.

9. Sugar produced during photosynthesis synthesized in.

(A) Stroma (B) Stroma thylakoids
(C) Grana thylakoids (D) Lumen

Explanatory Answer: (A)

Chlorophylls and other pigments contained in thylakoids absorb light energy and convert it into $NADPH_2$ and ATP, which are used to synthesize sugar in the stroma of chloroplast.

10. Which light disappears after falling on green plant body?

(A) Absorbed (B) Reflected

(C) Refracte (D) All of these

Explanatory Answer: (A)

Light can work in chloroplasts only if the pigments absorb light of different wavelengths, and the wavelengths that are absorbed disappear.

11. Which one of the following is a bacteriochlorophyll?

(A) Chlorophyll 'a' (B) Chlorophyll 'b'
(C) Chlorophyll 'c' (D) None of these

Explanatory Answer: (D)

Bacteriocholorophyll differ from chlorophylls a, b, c, and d, and if present in photosynthetic bacteria only

12. Plants appear green because.

(A) Green wavelengths are absorbed (B) Green wavelengths are reflected
(C) Green wavelengths are masked by others (D) All of these work together

Explanatory Answer: (B)

The plants appear green because green wavelengths are reflected. Chlorophylls absorb mainly violet-blue and orange-red wavelengths. Green and yellow wavelengths are least absorbed by chlorophylls and are transmitted or reflected, although the yellows are often masked by darker green colour.

13. The most abundant and most important Photosynthetic pigment.

(A) Chlorophyll 'a' (B) Chlorophyll 'b'
(C) Carotene (D) Xanthophyll

Explanatory Answer: (A)

Of all the chlorophyll, chlorophyll 'a' is the most abundant and the most important photosynthetic pigments as it takes part directly in the light dependent reaction that converts light energy to chemical energy.

14. The core of porphyrin contains 4 atoms of.

(A) Mg (B) N
(C) C (D) a and b

Explanatory Answer: (A)

The chlorophyll molecule consists of two parts; Head and tail. Head is complex porphyrin ring made up of four joined smaller pyrole rings composed of carbon and nitrogen. An atom of magnesium is present in the center of the porphyrin ring and is coordinated with the nitrogen of each pyrole ring.

15. Visible light range from about.

(A) 440 to 770 nm (B) 380 to 750 nm
(C) 430 to 670 nm (D) 450 to 600 nm

Explanatory Answer: (B)

light is a form of energy called electromagnetic energy of radiations. Light behaves as waves as well as sort of particles called photons. The raditions important to life are the visible light that range from 380 to 750 nm in wavelengths.

16. Phytol is attached to.

(A) Only one of the pyrole ring (B) Two pyrrole rings
(C) Three pyrrole rings (D) All the four pyrole rings

Explanatory Answer: (A)

Long hydrocarbon tail is attached to one of the parole rings is phytol (C_2OH_{39}) The chlorophyll moiecule is embedded in the hydrophobic core of hyracod membrane by this tail.

17. Photosynthesis taking place in water.

(A) 1% (B) 10%
(C) 90% (D) 99%

Explanatory Answer: (C)

Terrestrial plants carry out about 10% of total photosynthesis: and the rest (90%) occurs in oceans, lakes and aquatic photosynthetic plants.

18. Cells that control the entry of CO_2 into the leaves.

(A) Subsidiary cell (B) Epidermis
(C) Guard cell (D) All of these

Explanatory Answer: (C)

The entry of CO_2 into the leaves depends upon the opening of stomata. The guard cells guarding the stoma, because of their peculiar structure and changes in their shape, regulate the opening and closing of stomata.

19. Condition of stomata at night.

(A) Closed (B) Completely open
(C) Partially closed (D) All of these

Explanatory Answer: (C)

Stomata are adjustable pores that are usually open during the day when CO2 is required for photosynthesis, and partially closed at night when photosynthesis stops. Carbon dioxide enters leaves through stomata and gets dissolved in the water absorbed by the cell walls of mesophyll cells,

Stomata cover about 1-2 percent of leaf surface but they allow proportionately more gas to diffuse.

20. ☛ Condition of stomata at night.

(A) Closed (B) Completely open
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21. ☛ Light reaction of photosynthesis involves.

(A) Photolysis (B) Photophosphorylation
(C) Assimilation power (D) All these

Explanatory Answer: (D)

Light reaction is the phase during photosynthesis in which photosynthetic pigments absorb light energy and convert it into chemical energy. As a result of the energy conversion, reducing and assimilation power in the form of $NADPH+H^+$ ($NADPH_2$) and ATP (photophosphorylation) are formed that store energy temporarily. Oxygen is relapsed during the reaction when water molecules split (photolysis).

22. ☛ Products of light reaction of photosynthesis proved energy and.

(A) $NADH^2$ (B) Oxygen
(C) CO^2 (D) All of these

Explanatory Answer: (A)

$NADPH_2$ provides energized electron and H+ while ATP provides chemical energy for synthesis of sugar by reducing CO^2.

23. ☛ One of the following is not a part of reaction center of photo system of light reaction.

(A) Chlorophyll 'a' (B) Carotenoids
(C) Electron acceptor (D) Electron transport system

Explanatory Answer: (B)

Reaction center has one or more molecules of chlorophyll 'a' along with a primary electron acceptor, and associated electron carriers of electron transport system.

24. ☛ Photophosphorylation is named so because.

(A) It is driven by light energy (B) It provides chemical energy for sugar synthesis.
(C) Electron transport chain in involved (D) ATP is synthesized

Explanatory Answer: (A)

Photophosphorylation is named so because it is driven by light energy. It is ATP synthesis that occurs when electrons move down the chain and the energy released is used by thylakoid membrane to produce ATP.

25. ☛ The path of electron flow through the two photosystems during non-cyclic photophosphorylation is.

(A) Chemiosmosis (B) Oxidative phosphorylation
(C) Oxidative phosphorylation (D) Cyclic electron flow

Explanatory Answer: (B)

the path electron flow through the two photosystems during non-cyclic photophosphorylation is called Z-scheme because of zigzag pathway the electrons take the most abundant protein on the earth.

26. ☛ The most abundant protein in the chloroplasts.

(A) RUBP (B) Rubisco
(C) 3-PGA (D) G3p

Explanatory Answer: (A)

Rubisco is the most abundant protein enzyme is chloroplasts, and probably.

TEST NO.15

1. ☛ Gene of interest for biotechnology can be obtained

(A) From the chromosomes (B) By chemical synthesis
(C) From mRNA (D) All of these

Explanatory Answer: (D)

Gene of interest for biotechnology can be obtained by three possible ways. It can be isolated from the chromosomes by cutting it with the help of enzymes, the restriction endonucleases. If the genes are small,

these can be synthesized in the laboratory. The gene of interest can also be made from mRNA using enzyme reverse transcriptase.

2. ☛ Reverse transcriptases is used to get a gene of interest

(A) From mRNA (B) From a chromosome
(C) Synthesized chemically (D) All of these

Explanatory Answer: (A)

A gene of interest can by synthesized in the laboratory from MRNA using reverse transcriptase. This DNA molecule is called complementary DNA (cDNA)

3. ☛ Out of 400 restriction enzyme how many are frequently used in recombinant DNA technology

(A) 10 (B) 20
(C) 400 (D) 100

Explanatory Answer: (B)

So far 400 restriction enzymes have been isolated, out of which about 20 are frequently used is recombinant DNA technology.

4. ☛ Restriction enzyme can cut the DNA at a very specific site having specific reverse sequence of

(A) 4 Nucleotides (B) 6 Nucleotides
(C) 4 to 6 Nucleotides (D) 10 Nucleotides

Explanatory Answer: (C)

The restriction enzyme can cut DNA at pallindromic sequence, a specific sequence of four or six nucleotides arranged symmetrically in the reverse order.

5. ☛ The single stranded two ends of DNA contain which sequence

(A) TT AA (B) AA TT
(C) Both a & b (D) None of these

Explanatory Answer: (C)

The single stranded two ends of the DNA molecules are complementary. They are called sticky ends because they can bind by complementary base pairing. When these are cut by restriction enzyme, a gap is produced where a piece of foreign DNA can be placed.

6. ☛ The means by which recombinant DNA is introduced into a host cell.

(A) Plasmid (B) Virus
(C) Vector (D) Chimaeric DNA

Explanatory Answer: (C)

The mean by which recombinant DNA is introduced into a host is called a vector. The most commonly used vector is plasmids. Viruses are also used as vector is plasmids. Viruses are also used as vectors. Chemiaeric DNA is another name for recombinant DNA.

7. ☛ A large number of molecules, cells or organisms that are identical to an original specimen are referred to as

(A) Probe (B) Plasmid
(C) Transgenic (D) Clone

Explanatory Answer: (D)

A clone can be a large number of molecules (clone genes) or cells (cloned bacteria) or organisms that are identical to an original specimen.

8. ☛ Natural extra-chromosomal circular DNA molecules which carry genes for antibiotic resistance and fertility, etc.

(A) Vector (B) Bacteriophage
(C) Plasmid (D) Recombinant DNA

Explanatory Answer: (C)

Plasmids are natural extra-chromosomal circular DNA molecules which carry genes for antibiotic resistance, fertility, etc.

9. ☛ Which of the following facilitates the insertion of foreign DNA into vector DNA?

(A) Ligase (B) Probes
(C) Helicase (D) Sticky ends

Explanatory Answer: (A)

DNA ligase seals the foreign piece of DNA into the vector DNA.

10. ☛ Substance that makes the bacterial cell more permeable to recombinant plasmid.

(A) Calcium chloride (B) Sodium chloride
(C) Potassium chloride (D) Both a & b

Explanatory Answer: (A)

The cloned recombinant bacterial cells and bacteriophages contain a copy of gene of interest (DNA segment from the source cell).

11. ☛ A collection of bacterial or bacteriophage clones, each clone containing a particular segment of DNA from the source cell is

(A) Genomic library (B) Genome
(C) Chimaeric DNA (D) Polymerases chain reaction

Explanatory Answer: (A)

A genomic library is a collection of bacterial or bacteriophage clones each containing a particular segment of DNA from the source cell.

12. ☛ Probe is a

(A) Single stranded DNA (B) Single stranded RNA
(C) Double stranded DNA (D) Single stranded radioactive nucleotide sequence

Explanatory Answer: (D)

A probe is a single-stranded nucleotide sequence that will hybridize (pair) into a the gene of interest. A particular probe is used to search a genetic library for a certain gene. It is either radioactive or fluorescent, therefore can be located easily.

13. ☛ PCR can help to amplify.

(A) A single gene (B) Small piece of DNA
(C) All the human genes (D) Both a and b

Explanatory Answer: (D)

PCR (polmerase chain reaction) is a technique that can create millions of copies of a single gene or any specific piece of DNA quickly in a test tube.

14. ☛ Polymerase chain reaction took its name from

(A) Its ability to generate millions of copies of a gene (B) DNA polymerase that carries out DNA
(C) It is prototpe of gene cloning (D) All these

Explanatory Answer: (B)

Polymerase chain reaction is a process by which DNA polymerase is used to copy a sequence of interest repeatedly making millions of copies of the same DNA. It takes its name from DNA polymerase that help replication of gene or small piece of DNA over and over.

15. ☛ Sequence of 20 particular complimentary bases at the start and end of the target DNA is known as

(A) Probe (B) Primer
(C) Primase (D) Ligase

Explanatory Answer: (B)

Primer is a sequence of about 20 bases that are complementary to the bases on either side of the target DNA. It must be available before carrying PCR. DNA polymerase copies the target DNA only if it binds to the primer.

16. ☛ A disease in which patients lack a gene that codes for trans-membrane carrier of the chloride ions and die due to numerous infections of the respiratory tract.

(A) Cystic fibrosis (B) SCID
(C) Familial hypercholesterolemia (D) Cancer

Explanatory Answer: (A)

In cystic fibrosis the patients lack a gene that codes for trans-membrane carrier of the chloride ions and die due to numerous infections of the respiratory tract.

17. ☛ A plant cell that has full genetic potential of the organism and can be grown into an entire new plant.

(A) Cloned (B) Hybridized
(C) Totipotent (D) Transgenic

Explanatory Answer: (C)

A plant cell that has full genetic potential of the organism and can be grown into an entire new plant is called totipotent

18. ☛ A thermo-stable DNA polymerase

(A) Reverse transcriptase (B) Taq polymerase
(C) Primase (D) EcoR1

Explanatory Answer: (B)

Taq polymerase is a thermos table (temperature insensitive) DNA polymerase extracted from a bacterium Thermus aquaticus found living in hot springs.

19. ☛ A thermos table DNA polymerase

(A) Reverse transcriptase (B) Taq polymerase
(C) Primase (D) EcoR1

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Taq polymerase is a thermos table (temperature insensitive) DNA polymerase extracted from a bacterium Thermus aquaticus found living in hot springs.

20. ☛ A technique used to grow vegetables such as tomatoes, celery, asparagus, etc is

(A) Somatic embryos (B) Anther culture
(C) Micropropagetion (D) Cell suspension

Explanatory Answer: (A)

In order to produce somatic embryous, the cells walls of a small piece of tissue (usually mesophy!! cells) are digested with the help of enzymes and these naked cells called protoplasts are grown on a liquid nutrient medium. The protoplasts regenerate a new cell wall grows into begin to divide. These clumps of used to produce embryos called somatic embryos. Somatic embryos are being used to cultivate vegetables like tomatoes, celery, asparagus and ornamental plants such as lilies, begonias, etc.

21. ☛ Gene therapy is being done to patients suffering from

(A) Coronary angioplasty (B) SCID
(C) Familial hypercholesterolemia (D) All these

Explanatory Answer: (D)

During coronary angioplasty, the balloon catheter used to open the closed artery is coated with a plasmid that contains a gene for vascular endothelial growth factory. The expression of this gene promotes the proliferation of blood vessels to bypass the obstructed area. SCID is 'severe immunodeficiency syndrome" in children. Familial hypercholestroplemia is condition that develops when liver cells lack a receptor for removing cholesterol from the blood. The high levels of blood cholesterol make the patient subject to fetal heart attacks at young age.

22. ☛ The insertion of genetic material into human cells for the treatment of a disorder is called

(A) Cloning (B) Genetic engineering
(C) gene therapy (D) None of these

Explanatory Answer: (C)

The insertion of genetic material into human cells for the treatment of disorder is called gene therapy. It includes the procedure that give a patient healthy genes to make up for faulty genes and also includes the used of genes to treat various other human illness such as cancer and cardiovascular diseases.

23. ☛ By gene transfer in plants we have been able to get

(A) Human hormones (B) Clotting factors
(C) Antibodies (D) All of these

Explanatory Answer: (D)

Plants are being engineered to produce human hormones, clotting factors and antibodies in their seeds. One type of antibody made by corn can deliver radioisotope to tumor cells and another made by soybeans can be used as treatment for genital herpes.

24. ☛ Airbrone chemical pollutants can be prevented to enter into the air with the help of

(A) Bioreactors (B) Biofilters
(C) Bioindicators (D) Gene pharming

Explanatory Answer: (A)

bacteria can be used to as biofilters to prevent airborne chemical pollutants from being vented into the air. They can also remove sulphur from coal before it is burned and help to clean up toxic waste dumps.

25. ☛ Genetically engineered organisms used to produce biotechnology products.

(A) Recombinants (B) Bioreactors
(C) Pallindrone (D) Transgenic organisms

Explanatory Answer: (D)

Free-living organisms in the environment that have had a foreign gene stably inserted into them are called transgenic organisms. This gene can be passed on to successive generations. Such organisms are used to produce biotechnology products.

26. ☛ The use of transgenic farm animals to products pharmaceuticals is called

(A) Recombinant technology (B) Gene cloning
(C) Gene pharming (D) All of these

Explanatory Answer: (C)

The use of transgenic farm animals to produce pharmaceuticals is called gene pharming. Genes that code of therapeutic and diagnostic proteins are incorporated into the animal's DNA and the proteins appear in the animal's milk.

27. ☛ A direct way to produce plants which

express recessive alleles.

(A) Somatic embryos
(B) Anther culture technique
(C) Protoplast fusion
(D) Somaclonal variations

Explanatory Answer: (B)

Anther culture technique is a direct way to produce plants that express recessive alleles. If these recessive alleles govern desirable traits, the plants grown have these traits.

28. Which is a preferable vehicle for a biotechnology product?

(A) Milk
(B) Urine
(C) Flesh
(D) Bones

Explanatory Answer: (B)

Urine is a preferable vehicle for a biotechnology product than milk because all animals in a herd urinate whereas only females produce milk. Both males and females starts urinate at birth while females produce milk at maturity. Also it easier to extract proteins from urine than farm milk.

29. The traditional act of crossing of different varieties of plants or even species is called

(A) Genetic engineering
(B) Hybridization
(C) Gene cloning
(D) Tissue culture technique

Explanatory Answer: (B)

The crossing of different varieties of plants or even species is called hybridization. It is a traditional way to produce plants with desirable traits. Hybribization, followed by vegetative propagation of mature plants, result in a large number of identical plants with desirable traits.

30. Tissue culture technique used to produce chemical used in the production of drugs.

(A) Callus formation
(B) Somatic embryo
(C) Proembryo
(D) Cell suspension culture

Explanatory Answer: (D)

In cell suspension culture rapidly growing cultures are cut into small pieces and shaken in a liquid nutrient medium into single cells or clumps of cells as the entire plant. For example cell suspension cultures of Cinchona lederiana produce quinine. Scientists are of the view that it will possible to maintain cell suspension cultures in bioreactors for the purpose of producing chemical used in production drugs, cosmetics and agricultural chemicals.

31. Gene for the production of the firefly enzyme luciferase was inserted in tobacco protoplast by

(A) High-voltage electric pulses
(B) Particle gun
(C) Genetically engineered virus
(D) A Gene coding for channel proteins

Explanatory Answer: (A)

High-voltage electric pulses were used to make pores in the plasma membrane to insert a gene for the production of firefly enzyme, the luciferase. The gene was inserted into tobacco protoplast and the adult plants glowed when sprayed with the substrate luciferin.

32. A goat is genetically engineered to produce one of the followings

(A) Antithrombin III
(B) Drug for treatment of cancer
(C) Drug for treatment of cystic fibrosis
(D) All these

Explanatory Answer: (A)

A herd of genetically engineered goats is used to produce antithrombin III, factor that help present blood clot during surgery.

33. Particles gun is used to

(A) Remove monoploid nucleus from egg
(B) To obtain gene for channel protein
(C) To bombard callus with DNA-coated microscopic metal particles
(D) Produce genetically engineered virus

Explanatory Answer: (C)

Particle gun is a method developed by John C. Sanford and Theodore M. Klein (1987) to introduce DNA into a plant tissue culture callus. It bombards callus with DNA- coated microscoping metal particles. Many plants including corn and wheat have been genetically engineered by using particle gun.

TEST NO.16

1. What conservation plan can prevent the extension of endangered species?

(A) A global system of national parks
(B) Protected landscapes
(C) Zoo and botanical gardens
(D) All of these

Explanatory Answer: (D)

Preservation of endangered species depends on a multifactorial conservation plan that includes a global system of national parks to protect wildlife habitats, protected landscapes and multiple use areas that allow controlled private activity but also retain value as a wildlife habitat, and zoos and botanical gardens to save endangered species.

2. A group of similar organisms living together in space and time is called

(A) Species
(B) Population
(C) Community
(D) Ecosystem

Explanatory Answer: (C)

All the populations within an ecosystem are known as a community. These are interconnected one way or the other.

3. All of the following are not characteristics of a community except.

(A) The total number of Delbergia sissoo plants in your garden
(B) The total number of rabbits in your house
(C) The total number of animals and plants in your house
(D) The total number of house sparrow in your house

Explanatory Answer: (A)

Major regional ecological community of plants and animals from biomes. Each biome consists of a combination of plants and animals in the form of a climax community. There are six major terrestrial biomes; forests, grasslands, woodlands, shrub-land, semi-desert land and desert.

4. One of the following is characterized by uniform life form of vegetation.

(A) Population
(B) Ecosystem
(C) Biome
(D) Biosphere

Explanatory Answer: (C)

A biome is characterized by a uniform life form of vegetation, for example in a grassland the dominant vegetation is grasses.

5. Which of the following in not a member of our environment?

(A) Water
(B) People
(C) Microorganism
(D) All these makes our environment

Explanatory Answer: (D)

Our environment includes all the living and non-living components such as water, air temperature, light, people, other animals, food, microorganisms, etc.

6. When living and non-living interact to produce a stable system in which exchange of material with flow of energy takes place, it forms a (an)

(A) Environment
(B) Ecosystem
(C) Stable community
(D) Ecological succession

Explanatory Answer: (B)

Ecosystem is the major unit of ecology consisting of biotic and abiotic components. The living and non-living components of an ecosystem interact to produce a stable system in which exchange of material with flow of energy takes place.

7. The living organisms which can prepare their own food is

(A) predators
(B) Parasites
(C) producers
(D) Prey

Explanatory Answer: (C)

The green photosynthetic plants that capture and bring light energy into the ecosystem are called producers. These are able to manufacture organic food from simpler inorganic substances. They are also called autotrophs.

8. The living organisms that cannot prepare their own food but obtained ready-made food from others.

(A) Primary and secondary consumers
(B) Secondary and tertiary consumers
(C) Primary consumers
(D) Consumers

Explanatory Answer: (D)

The organisms that obtain energy directly or indirectly from the producers as ready-made organic food are termed consumer. They are heterotrophic organisms. Primarily animals are consumers. The organisms that feed directly on producers are primary consumers, whereas the organisms that use primary consumers as food are known as secondary consumers.

9. If you are studying 50 to 100 soybean plants for effect of water pollution of their growth and yield, it is

(A) An ecosystem (B) Auto ecology
(C) A community (D) Synecology

Explanatory Answer: (B)

The study of a single population's relationship to its environment is called autecology, for example the study of effect of water pollution on the growth and yield of soybean population.

10. A caterpillar eating green leaves, a blue bird feeding on caterpillar and blue bird eaten by eagle is an example of

(A) Simple food chain (B) Food web
(C) Both a and b (D) None

Explanatory Answer: (B)

It is a combination of many food chains. Like a food chain it begins with a producer any may comprises of three to five trophic levels. The variety of pathways in a feed web helps to maintain the stability of the ecosystem.

11. Trophic level is

(A) Position of an organism in a food chain (B) Position of an organism in a food web
(C) Both a and b (D) None of these

Explanatory Answer: (B)

More complex food links or trophic levels are found in a food web. The first trophic level is producer level and it includes all green plants, grass and phytoplankton. The second trophic level comprises consumers and fourth trophic level contains tertiary consumers.

12. Succession is change in the

(A) Population structure of an ecosystem with time (B) Community structure of an ecosystem with time
(C) Population structure of an ecosystem (D) Community structure of an ecosystem

Explanatory Answer: (B)

The change in community structure of an ecosystem over a period of time is called succession. The succession begins few hardy invaders called pioneers and ends with a diverse and relatively stable climax community.

13. More complex food links or trophic levels are found in

(A) Food chain (B) Food web
(C) Grassland (D) All these

Explanatory Answer: (B)

More complex food links or trophic levels are found in a food web. The first trophic level is producer level and it includes all green plants, grass and phytoplankton. The second trophic level comprises consumers and fourth trophic level contains tertiary consumers

14. Which is the pioneer stage for primary succession starting in a pond?

(A) Phytoplankton stage (B) Crustose lichen stage
(C) Foliose lichen stage (D) herbaceous plant stage

Explanatory Answer: (C)

The association between an angle and a fungus (lichen) is a symbiotic association (mutualism) in which both get benefit from each other. An animal that preys other animals is a predator and the animal that is caught and eaten is the prey.

15. The lichens that get impregnated on the surface of rock like a crust

(A) Fruitlcose (B) Foliose
(C) Crustose (D) All these

Explanatory Answer: (A)

A stable stage is succession that remains essentially the same if nothing changes in the environment to upset the balance is called climax stage. Woody forest would be the climax stage in succession starting on the surface of bare rock.

16. Which is the pioneer stage for primary succession starting in a pond?

(A) Phytoplankton stage (B) Crustose lichen stage

(C) Foliose lichen stage (D) herbaceous plant stage

Explanatory Answer: (C)

The association between an angle and a fungus (lichen) is a symbiotic association (mutualism) in which both get benefit from each other. An animal that preys other animals is a predator and the animal that is caught and eaten is the prey.

17. ☛ Gras → sheep → man. This relationship is called

(A) Food web (B) Food chain
(C) Both a & b (D) None

Explanatory Answer: (B)

A linear chain of organisms characterized by eating and being eaten. It begins with a producer and ends in a consumer of high order (tertiary or quaternary consumer). A food chain comprises of three to five trophic levels.

18. ☛ A species in imminent danger of extinction throughout its range is called.

(A) Evolved (B) Non-evolved
(C) Endangered (D) Extinch

Explanatory Answer: (C)

A species that is in imminent danger of extinction throughout its range (where it lives) is called endangered species. In Pakistan blackbuck, common leopard, great Indian bustard, Houbara bustrad, white-headed duck, marbled teal and Indus dolphin have been declared endangered species.

19. ☛ Which is the pioneer stage for primary succession starting in a pond?

(A) Phytoplankton stage (B) Crustose lichen stage
(C) Foliose lichen stage (D) herbaceous plant stage

Explanatory Answer: (A)

The pioneer stage for primary succession starts with the growth of phytoplankton which are the producers in the pond ecosystem. Lichen stage comes later,

20. ☛ The thin shell of air, land and water around the earth that supports life is

(A) Ecosystem (B) Environment
(C) Biosphere (D) Ecosystem

Explanatory Answer: (C)

The thin layer of earth in which all living organisms exist is called biosphere.

21. ☛ When chemical elements essential for life of an organism move from living to non-living portions of an ecosystem in a cyclic manner, it is termed.

(A) macronutrients (B) Micronutrients
(C) Biogeochemical cycles (D) All these

Explanatory Answer: (C)

The nutrient elements move from living to non-living portions of ecosystem in a cyclic manner. This to and for movement of nutrient elements is called biogeochemical cycles or nutrient cycles. These include nitrogen cycle.

22. ☛ One of the followings is not required in trace amounts for the life of organisms.

(A) Nitrogen (B) Molybdenum
(C) Iodine (D) Iron

Explanatory Answer: (A)

Nitrogen is a macronutrient. The nutrient elements required by organisms in large amount are called macronutrients. These include water, carbon, hydrogen, oxygen, nitrogen, phosphorus, sulphur and calcium. Whereas the nutrient elements required by organisms in small quantity or in trace amount are called micronutrients. These include zinc, molybdenum, iron, iodine, etc. these are also called trace elements.

23. ☛ Which of the following can use nitrogen gas?

(A) Plants (B) Bacteria
(C) Animals (D) None

Explanatory Answer: (D)

Most living things cannot use atmospheric nitrogen to make amino acids and other nitrogen containing compounds. They are dependent on nitrogen present in the soil minerals.

24. ☛ Which one of the following terms describes the change from plant proteins to ammonium?

(A) Nitrification (B) Ammonification
(C) Dentrification (D) Fermentation

Explanatory Answer: (B)

The release of ammonia or ammonium ions from complex organic compounds such as proteins, amino acids and nucleotides by the action of microorganisms is called ammonification.

25. ☛ The form in which most nitrogen moves

from the soil into the roots

(A) Atmospheric nitrogen (B) Ammonium ions
(C) Nitrates (D) All these

Explanatory Answer: (C)

Although plants can utilize ammonium directly, however most nitrogen moves from soil into the roots in the form of nitrates. Once nitrate is inside the plants cell, it is reduced to ammonium and transferred to carbon containing compounds to produce amino acids and other nitrogenous compounds needed by the plant. This is called assimilation.

26. Which one of the following returns the nitrogen in animals cells to the air?

(A) Respiration (B) Photosynthesis
(C) Bacterial action (D) Combustion

Explanatory Answer: (C)

The breakdown of nitrates by certain bacteria and release of nitrogen back into the atmosphere is called Dentrification. It usually occurs in poorly drained soils.

27. Nitrates are lost from the soil the soil by which of the followings?

(A) Erosion (B) Fire
(C) Water percolating through the soil (D) All these

Explanatory Answer: (D)

ALthough the nitrogen cycle appears complete and self-sustaining, however nitrates are lost from the soil by processes such as erosions (removal of fertile topsoil by the action wind or water), fire and dissolved in water that move deep into earth under the action of gravity.

28. The nitrogen cycle is maintained primarily by the activities of

(A) Nitrogen-fixing bacteria (B) Ammonifying bacteria
(C) Fungi (D) All these

Explanatory Answer: (A)

The nitrogen is maintained primarily by the activities of nitrogen-fixing bacteria which incorporate gaseous nitrogen from air into organic nitrogen-containing compounds.

29. All of the following are different steps in nitrogen cycle except

(A) Ammonification (B) Calcuification
(C) Nitrification (D) Dentrification

Explanatory Answer: (B)

The cyclic pathway by which the nitrogen is circulated and recirculated between the living organisms and their environment is called nitrogen cycle. The principal stages of nitrogen cycle are: ammonification, nitrification and assimilation.

30. The amount of energy left after plants have met their respiratory needs shows up as plant

(A) Gross primary production (B) Net primary production
(C) Biomass (D) All these

Explanatory Answer: (C)

The total amount of energy fixed by plants is called gross primary production whereas the amount of energy left after plants have their respiratory nee is net primary production. The net primary production shows up a biomass (the weight of all the living organisms in a given population, area of other unit being measured).

31. The thin shell of air, land and water around the earth that supports life is

(A) Ecosystem (B) Environment
(C) Biosphere (D) Ecosphere

Explanatory Answer: (C)

The thin layer of earth in which all living organisms exist is called biosphere. Organisms within the biosphere not only adapt to the environment but also interact to modify and control chemical and physical conditions of the biosphere.

32. Producers do not capture energy coming from sun

(A) 1% (B) 99%
(C) 105% (D) 90%

Explanatory Answer: (B)

About 1% of the total energy from the sun is trapped by the producers in an ecosystem. The remaining 99% of solar energy is used to evaporate water, heat up soil and then lost ot the outer space.

33. The largest ecosystem on earth is

(A) Hydrospheric (B) Lithospheric
(C) Both a and b (D) none of these

Explanatory Answer: (A)

Self-water ocean and sea are the largest ecosystems on the earth. These cover about 71% of earth's surface.

34. ☛ The diversity of flora and fauna in hydrospheric ecosystem depends on

(A) Energy (B) Nutrient
(C) Temperature (D) Both a & b

Explanatory Answer: (D)

The major factors that determine the quantity and type of life in aquatic ecosystems are energy and nutrients.

35. ☛ The productivity of hydrospheric ecosystem is indicated by

(A) Consumptions of CO_2 (B) Evolution of O_2
(C) Both a & b (D) None

Explanatory Answer: (C)

The productivity of an aquatic ecosystem can be indicated by consumption of CO_2 and evolution of oxygen in the process of photosynthesis

36. ☛ The productivity of aquatic ecosystem is basically determined by

(A) Light (B) Nutrients
(C) Evolution of oxygen (D) Both a and b

Explanatory Answer: (D)

The productivity of an aquatic ecosystem is basically determined by the light and nutrients. It varies with light intensity and amount of nutrients.

37. ☛ All of the following are zones in lakes except

(A) Littoral zone (B) Limetic zone
(C) Benthic zone (D) Profundal zone

Explanatory Answer: (C)

The lake ecosystem can be divided into three main zones; litoral zone, limnetic zone and profundal zone.

38. ☛ All of the following are organism of profundal zone except

(A) Bacteria (B) Algae
(C) Fungi (D) Snails

Explanatory Answer: (B)

profundal zone lacks sufficient light to support photosynthesis; therefore it is inhabited mainly by decomposers and detritus feeders such as snails, certain insect larvae, bacteria, fungi and fishes.

39. ☛ The organisms in a hydrosopheric system on which the most other life ultimately depends.

(A) Phytoplanktons (B) Zooplanktons
(C) Propoises (D) Blue jack fish

Explanatory Answer: (A)

The photosynthetic phytoplanktons (organisms floating on the surface of a water body) are the producers on which most other life ultimately depends.

40. ☛ Which of the following in an aquatic ecosystem is because of human activities?

(A) Eutrophication (B) Water pollution
(C) biological oxygen demand (D) All these

Explanatory Answer: (A)

The excessive growth of phytoplankton due to addition of nutrients contained in the sewerage, washed from fertilizers from fields, etc is called eutrophication. Blue-green algae form a scum on the surface of lake depriving the submerged plants from light. They also case oxygen depletion (biological oxygen demand). Dead and decaying bodies of these organisms cause water pollution.

41. ☛ Which of the following is limited in a lithospheric system?

(A) Light (B) Nutrients
(C) Water (D) None

Explanatory Answer: (C)

Terrestrial ecosystem receives plenty of light and soil provides abundant nutrients. However, water is limited and very unevenly distributed both in place and in time.

42. ☛ Uniformly warm and moist climate is found in

(A) Temperate areas (B) Tropics
(C) Arid areas (D) Sub-tropics

Explanatory Answer: (B)

Favourable temperature is unevenly distributed in land in place and time. On poles it is below freezing while in temperature zones it is favourable during certain seasons of the year; however in tropics it is uniformly warm and moist.

43. ☛ Which one of the following are adaptations of plants and animals to live on land?

(A) Evolution of vascular bundles in plants (B) Evolution of skeleton in animals
(C) Evolution of homeostasis (D) All of these

Explanatory Answer: (D)

The life originated first in water and then shifted to land. Plants and animals developed various adaptations while shifting from water to land environment. Plants evolved vascular bundles, and animals evolved skeleton to support them against force of gravity. Similarly plants and animals developed methods to conserve water in their body and regulation of temperature (homeostasis) such as bark and skin.

44. All of the following are not characters of fertile soil except

(A) High concentration of salts
(B) Maximum water holding
(C) A firm and hard soil
(D) least porous

Explanatory Answer: (B)

The soil of temperate deciduous forests is very fertile, rich in organic matter with maximum water holding capacity animals and they face diminished food supply. They face diminished food supply but increased energy requirement during subfreezing weather.

45. Northern coniferous forests are called

(A) Alpine
(B) Boreal
(C) Taiga
(D) None

Explanatory Answer: (C)

Northern coniferous forests are called taiga. Conditions in taiga are harsher. The winters are longer and colder and the growing season is shorter. The trees in taiga are coniferous and possess help these to shed snow.

46. The grasslands of temperate region is called

(A) Praries
(B) Savanna
(C) Taigas
(D) None

Explanatory Answer: (A)

Grasslands present in temperate climate are also called Prairies, such as Prairies of North American, Pampas of Argentina. These are called prairies because of absence of woody plants.

47. Distinct summer and winter season are pronounced

(A) Near the ploes
(B) At equator
(C) Farther away from equator
(D) At high altitudes

Explanatory Answer: (C)

Slightly farther away from the equator the rainfall in not nearly as constant and there is pronounced wet and dry season that means distinct summer and winter. These areas are characterized by presence of temperate deciduous forests. The plants in these forests shed their leaves in dry season.

48. The annual rainfall in grassland ranges from

(A) 750-1500mm
(B) 250-750mm
(C) 25-50mm
(D) 25-250mm

Explanatory Answer: (B)

The grasslands usually face severe droughts and the average rainfall in grasslands ranges from 250-750mm (10-30 inches). In tropical and subtropical grasslands the rainfall reaches about 1500mm (about 60 inches).

49. Which of the following is not a characteristic of grassland?

(A) layering
(B) Excess salinity
(C) High productivity
(D) Cacti and Euphorbia are most common plants

Explanatory Answer: (D)

Cacti and Euphorbias are common plants in deserts. Layering is a characteristic of grassland. Tall grasses form the first layer, mid-high grasses second layer, and short grasses and forbs form the third layer. The soil of grassland is basically impermeable with excessive salintiy. In sub-humid tropical productivity is more than 400 gm/m^2

50. The dominant plant species in grasslands are

(A) Grasses
(B) Graminoids
(C) Forbs
(D) Herbs

Explanatory Answer: (B)

The dominant species in grasslands are graminoids, i.e., grasses and grass-like plants. In addition certain forbs such as composities, legumes; and many other plant species are also associated with grasses.

51. The deserts found in western Punjab of Pakistan are called

(A) Thal
(B) Thar
(C) Sahara
(D) Sahel

Explanatory Answer: (A)

The deserts found in western Punjab of Pakistan are called "Thal". The desert ecosystem in Sind province is termed "Thar". "Sahel" desert borders the southern edge of the "Sahara" desert in Africa.

52. A desert that is an example of a human population exceeding the carrying capacity of the land.

(A) Thal (B) Thar
(C) Sahel (D) Sahara

Explanatory Answer: (C)

Sahel is an example of a human population exceeding the carrying capacity of the land. The loss of productivity of the ecosystem is nearly irreversible and it has resulted in massive famines such as one that has occurred in Ethiopia in the mid 80s.

53. Which one of the following is the characteristic of succulent plants?

(A) They do not store water (B) Store water in leaves
(C) Store water in roots (D) None of these

Explanatory Answer: (D)

Succulents are desert plants such cacti and euphorbias that have fleshy leaves and stems. The water is stored in these parts for used during the period of drought.

54. The direct or indirect source of food, shelter, clothing, fuel, etc for humans is

(A) Environment (B) Forests
(C) Radiant energy (D) Nutrients cycles

Explanatory Answer: (A)

Environmental resources are the primary sources for the existence of humans. Environment is a treasure of all types of resources essential to maintain life on earth. Environment is a direct or indirect source for food, shelter, clothing, fuel, etc for humans.

55. All of the following are renewable resources except

(A) Air (B) Water
(C) Gas (D) Food

Explanatory Answer: (C)

The resources that are recycled in nature, therefore never depleted are called renewable resources. Air, water, food, land, forest and wildlife are renewable resources.

56. The raw material in a natural cycle for making food

(A) Carbon dioxide (B) Oxygen
(C) Nitrogen (D) Both a and c

Explanatory Answer: (D)

Carbon dioxide along with water is the basic raw material in photosynthesis and nitrogen is constituent of nucleic acids and proteins.

57. % age of fresh water which is available for our use

(A) 97% (B) 99%
(C) 03% (D) 01%

Explanatory Answer: (D)

About 97% of total water of planet earth is in ocean, 2% water is in the form of frozen ice caps, and only 1% is available as fresh water in lakes, streams and rivers.

58. The basic constituents of soil are

(A) Soil particles (B) Soil water
(C) Soil organisms (D) All these

Explanatory Answer: (D)

The upper layer of earth's crust is called soil. The basic constituents of soil are soil particles (sand, silt and clay), soil water and soil organisms.

59. Soil plays vital role in

(A) Anchorage of plants (B) Providing nutrients to plants
(C) Support life on land (D) All of these

Explanatory Answer: (D)

Soil plays vital role in supporting life on land. Land plants depend directly on soil to be anchored firmly. It also provides water, and organic and inorganic nutrients to plants.

60. All the non-cultivated plant and non-domesticated animals are referred to as

(A) Flora and fauna (B) Endangered species
(C) Wildlfie (D) Game animals

Explanatory Answer: (C)

All the non0cultivated plants and non-domesticated animals are referred to as wildlife. Game animals and plants have been major source of food for humans

61. Land may be abused because of

(A) Erosion (B) Poor agricultural practice