I. BIODIVERSITY

1. Systematics

Choose the correct answer
1. The basic unit of classification is
   a. genus   b. species   c. family   d. taxon
2. Unicellular plants found floating in oceans and freshwater are called
   a. algae   b. zooplanktons   c. phytoplanktons   d. epiphytes
3. Carolus Linnaeus proposed the following system of classification
   a. Phylogenetic   b. Two kingdoms   c. Five Kingdoms   d. Natural

Fill in the blanks
1. “Systema Naturae” is written by Carolus Linnaeus
2. Father of Ayurveda is Hippocrates
3. John Ray introduced the term species for the first time.
4. The author of “Species Plantarum” is Carolus Linnaeus
5. coined the word Taxonomy. Augustin pyramus de Candolle

Match the following
1. Fossil records - Phylogenetic studies
2. Whittaker - Five kingdom System
3. Carolus Linnaeus - Species Plantarum
4. John Ray - Species
5. Augustin de Candolle - Taxonomy

Choose the correct answer
1. T.M.V has the following symmetry.
   a. Cubical   b. helical   c. atypical   d. square
2. The infective nature of virus is due to
   a. protein coat   b. nucleic acid   c. envelope   d. tail fibres.
3. Developing a vaccine for SARS is difficult because
   a. it spreads by infectious materials   b. it is an enveloped virus
   c. it is constantly changing its form   d. it has ssRNA

Fill in the banks
1. W.M. Stanley isolated first virus in crystalline form.
2. The two important components of viruses are Nucleic acid and Protein coat
3. All fungalviruses have dsRNA.
4. Cauliflower Mosaic Virus is a plant virus which has DNA
5. HIV virus causes AIDS.

Match
1. Cyanophage - Blue green algae
2. Mycophage - Fungi
3. SARS - Corona virus
4. AIDS - HIV
5. Phage - Bacteria

2. Viruses

Choose the correct answer
1. The chlorophyll pigment found in green sulphur bacteria is
   a. bacteriochlorophyll   b. bacterioviridin   c. phycocyanin   d. phycoerythrin
2. Cell which keeps changing its shape is called

3. Bacteria

Choose the correct answer
1. The chlorophyll pigment found in green sulphur bacteria is
   a. bacteriochlorophyll   b. bacterioviridin   c. phycocyanin   d. phycoerythrin
2. Cell which keeps changing its shape is called
Fill in the blanks
1. **Louis Pasteur** proposed germ theory of disease.
2. **Capnophilic** bacteria require CO₂ for growth.
3. **Chemotaxis** is a type of movement of cells in response to chemical signals.
4. **Oxygen** is not evolved during bacterial photosynthesis

**Fungi**

Choose the correct answer
1. The study of Fungi is called
   a. phycology          b. plant pathology        c. systematics          d. mycology
2. The fungal cell wall is made up of
   a. chitin            b. cellulose           c. pectin           d. peptidoglycan

Fill in the blanks
1. The storage products of fungi are **glycogen** and **oil**.
2. Haustoria are rarely produced by **Facultative** parasites

**ALGAE**

Choose the correct answer
1. Phycology is the study of
   a. plants          b. virus           c. Algae           d. bacteria

Fill in the blanks
1. **Phycoerythrin** is the red colour pigment found in algae.
2. **Phycocyanin** is the blue colour pigment found in algae.
3. **Red algae** and **Blue green algae** lack motile cells.

**Match**
1. Macroscopic - Laminaria
2. Epiphyte - Growing on another plant
3. Benthic - Attached to the bottom of shallow water
4. Lithophyte - Grow attached to the rocks
5. Filamentous - **Spirogyra**.

**Bryophytes**

Choose the correct answer
1. Production of gametes in Bryophytes involve
   a. Meiosis              b. Mitosis          c. fertilization          d. reduction division

Fill in the blanks
1. In all bryophytes **Gametophyte** generation is dominant.
2. In all land plants other than bryophytes **Sporophyte** generation is dominant

**Pteridophytes**

Fill in the blanks
1. The process of evolution of the seed habit is associated with the origin of **Heterophory**
2. The dominant phase changed from **Gametophyte** to **Sporophyte** as in all Pteridophytes, Gymnosperms and Angiosperms
Spermatophytes (Gymnosperms)

Fill in the blanks
1. The most successful and advanced group of land plants are **Spermatophytes**
2. All seed plants are **Heterosporous**
3. The most extreme reduction of gametophyte has taken place in **Angiosperms**
4. The equivalent structure to a mega sporangium, in a seed plant is called an **Ovule**
5. The equivalent structure to a microsporangium, in a seed plant is called **Pollen sac**

II. CELL BIOLOGY

1. The Cell - Basic unit of life

Choose the correct answer
1. The process in which DNA is constantly read out into a particular set of mRNA is called
   a. translation b. protein synthesis c. DNA duplication d. transcription
2. The process of changing the form in order to carry out a specialized function is called
   a. differentiation b. growth c. cell division d. cell elongation

2. Cell Theory

Choose the correct answer
1. An exception to cell theory is
   a. fungi b. bryophyte c. seed plant d. pteridophyte

Fill in the blanks
1. Schleiden and Schwann proposed cell theory.
2. Cells are the **structural** and **functional** units of life.
3. The modified cell theory is called **Cell Principle or Cell Doctrine**

3. Prokaryotic and Eukaryotic Cell (Plant Cells)

Choose the correct answer
1. The extra-chromosomal DNA found in the bacterium *E.coli* is called
   a. mesosome b. nucleoid c. incipient nucleus d. plasmid

Fill in the blanks
1. Bacteria having a thin wall and an outer membrane separated from the cell wall are usually **GramNegative bacteria**
2. The plasmid is responsible for **Anti-biotic resistances** of the bacterium.
3. Plasmids are very much used in **Genetic engineering**
4. Ribosomes that exist in groups are called **Polysomes (or) Polyribosomes**

4. Light Microscope and Electron Microscope (TEM & SEM)

Fill in the blanks
1. The **decrease** value of D, the better will be the resolution.
2. The resolution of a microscope lens is numerically equivalent to **Resolution power**.
3. The purpose of using heavy metals in scanning electron microscopy is to provide enough **Contrast** to detect the details of the specimens.
4. The compound microscope uses **Optical** lenses to magnify the objects.

5. Cell Wall

Choose the correct answer
1. The addition of wall materials within the existing one is called
   a. accretion b. intussusception c. apposition d. deposition

Fill in the blanks
1. The cell wall of bacterium is made up of **peptidoglycon**
2. The cell wall of a typical plant cell is made up of **cellulose**.
3. The cell wall of a fungus is made up of **chitin**.
4. The addition of wall materials over the existing one is called **Accretion**
6. Cell Membrane

Choose the correct answer
1. Active transport of molecules take place
   a. along the concentration gradient  
   b. along the electric gradient
   c. along the pressure gradient
   d. against the concentration gradient
2. Phagocytosis is also known as
   a. cell eating  
   b. cell death  
   c. cell drinking  
   d. cell lysis

Fill in the blanks
1. All the biological membranes are **Seletively permeable**
2. In passive transport method, transport of molecules takes place **Along** the concentration gradient.

7. Cell Organelles

Choose the correct answer
1. The spaces inside the folds of ER membrane are known as
   a. thylakoids  
   b. cisternae  
   c. mesosomes  
   d. periplasmic space
2. These are colourless plastids
   a. chromoplasts  
   b. chloroplasts  
   c. elaioplasts  
   d. leucoplasts
3. The internal system of inter-connected membrane-limited sacs of chloroplast are called
   a. grana  
   b. stroma  
   c. thylakoids  
   d. cisternae

Fill in the blanks
1. DNA is organized into linear structures called **chromosomes**
2. The endoplasmic reticulum is responsible for **Protein** in a cell.
3. **Ribosomes** are the sites of protein synthesis.
4. **Chromosomes** form the physical basis of heredity.

Match
1. Power house of a cell  
2. Site of protein synthesis  
3. Controls all metabolic activities of cell  
4. Physical basis of heredity  
5. Chemical basis of heredity

- Mitochondria
- Ribosomes
- Nucleus
- Chromosomes
- Genes

8. Cell Division

Choose the correct answer
1. During this phase there is a duplication of DNA
   a. G1 Phase  
   b. S phase  
   c. G2 Phase  
   d. interphase
2. Cytokinesis is the division of
   a. cytoplasm  
   b. nucleus  
   c. chloroplast  
   d. centriole
3. Terminalisation takes place during
   a. pachytene  
   b. zygotene  
   c. leptotene  
   d. diakinesis

III. PLANT MORPHOLOGY

1. Root, Stem and Leaf

One Mark

Choose the correct answer
1. The type of phyllotaxy found in *Calotropis* is
   a. alternate  
   b. opposite decussate  
   c. opposite superposed  
   d. ternate

Fill in the blanks
1. In *Bignonia unguiscati* **Three leaflets** become stiff, claw like hooks.
2. In *Sweet potato*, tuberous roots which have no definite shape are seen.
Match
1. Moringa - Tripinnate
2. Lemon - Unifoliate
3. Acacia - Phyllode
4. Utricularia - Bladder
5. Lathyrus - Tendril
6. Avicennia – Pneumatophores

2. Inflorescence

Choose the correct answer
1. Spike is a type of
   a. Racemose inflorescence  b. Cymose inflorescence  
   c. Mixed inflorescence     d. Special inflorescence
2. Dorstenia an example for
   a. raceme  b. panicle  c. spadix  
   d. coenanthism
3. This is a homogamous head with ray florets
   a. Vernonia  b. Tridax  c. Launaea  
   d. Helianthus
4. Musa in an example for
   a. spadix  b. mixed spadix  c. compound spadix  
   d. none of the above
5. Flowers are unisexual in
   a. cyathium  b. thrysus  c. verticillaster  
   d. cyme

3. Flowers, Fruits and Seeds

Choose the correct answer
1. The most conspicuous and characteristic structure of Angiosperm is
   a. Flower  b. Seeds  c. Fruits  d. leaves
2. The number of whorls present in a bisexual flower is
   a. One  b. Three  c. Two  d. Four
3. A flower is said to be complete when it has
   a. One whorl  b. Three whorls  c. Two whorls  
   d. Four Whorls
4. Timerous Flowers are common among
   a. Dicots  b. Xerophytes  c. Monocots  
   d. Gymnosperms
5. In deciduous type of calyx, the sepals fall off
   a. As soon as flower opens  b. After fertilization  
   c. In the bud condition  d. All the above
6. When anthers have two chambers, they are described as
   a. Dioecious  b. Dithecous  c. Diadelphous  
   d. Dimorphic
7. Gynoeicum with united carpels is termed as
   a. Apocarpous  b. Multicarpellary  c. Syncarpous  
   d. None of the above.
8. The type of placentation seen in cucumber is
   a. Basal  b. Parietal  c. Axile  
   d. Marginal
9. Seeds are produced from the
   a. Ovary  b. Carpels  c. Ovules  
   d. Locules
10. Seedless Grapes are the
    a. Simple Dry fruits  b. Multiple fruits  
    c. Aggregate fruits  d. Parthenocarpic Fruits
11. Which is the edible portion in berry?
    a. Epicarp  b. Endocarp  c. Mesocarp  
    d. All the above
12. Coconut belongs to
    a. Drupe  b. Syconus  c. Baccate  
    d. Aggregate
13. The type of fruit seen in Jack is
    a. Multiple fruit  b. Syconus  
    c. Sorosis  d. Aggregate
Fill in the blanks
1. A special leaf at whose axil the flower develops is called Bract
2. Thalamus is otherwise called Receptacle (or) torus
3. Bisexual flower has both androecium and gynoecium.
4. A flower having uniform number of all the floral parts is called Homemorous
5. Microsporangia are otherwise called Pollen sac
6. After fertilization, the ovary becomes Fruit
7. Legume is the characteristic fruit of Fabaceae Family.
8. The edible part of the Jack fruit is Perianth

I. Match the following
1. Hypogynous - Superior ovary
2. Twisted - Petals of Malvaceae
3. Syngenesious - Anthers united, filaments free
4. Epipetalous - Stamens attached to petals
5. Basal Placentation - Asteraceae
6. Caryopsis - Paddy
7. Unfertilized Ovary - Parthenocarpic Fruit
8. Ovary Wall - Pericarp
9. Fertilized Ovary - True Fruit
10. Apocarpous Ovary - Aggregate fruit

IV. GENETICS

1. Concept of Heredity and Variation

One mark
Choose the correct Answer
1. Moist vapour theory was given by
2. Blending theory was replaced by particulate theory of
3. The grand children may exhibit a feature of an earlier generation not seen in parents. This is called

Fill in the blanks
1. Polydactyly is the example for __________
2. A group of gametes is called a __________

2. Mendel's Laws of Inheritance

Choose the correct answer
1. The village where Mendel was born is
2. The cross which proves that sex has no influence on inheritance is
3. The recessive state for seed coat colour is

Fill in the blanks
1. The pairs of contrasting character traits of Mendel are called Alleles (or) allelomorphs
2. The dihybrid test cross ratio is 1:1:1:1

Match
1. Plant height - Dwarf
2. Position of flower - Terminal
3. Colour of pod - Yellow
4. Seed shape - Wrinkled
5. Pod shape - Constricted
3. Chromosomal Basis of Inheritance

Choose the correct Answer
1. The smallest unit of the gene which codes for an amino acid is
2. The functional unit of a gene which can synthesize one polypeptide is called
3. The gene is present at a specific position on the chromosome called
   a. Locus        b. Nucleotide c. Nucleoside d. Allele
4. The chromosomal basis of inheritance was given by
   a. Schleiden & Schwann   b. Sutton & Boveri
   c. Singer & Nicholson   d. Morgan & Bridges

4. Intermediate Inheritance (Incomplete Dominance)

Choose the correct answer
1. Incomplete dominance is also called
   a. Intermediate inheritance b. Blending inheritance
   c. Partial dominance     d. All the above
2. The phenomenon of intermediate inheritance is observed in
   a. Lathyrus               b. Antirrhinum
   c. Cucurbita             d. Maize
3. The phenotypic ratio of incomplete dominance is
   a. 1:2:1                  b. 3:1
   c. 9:3:3:1               d. 1:1

5. Epistasis

Choose the correct answer
1. Inheritance of flower colour in *Lathyrus odoratus* was studied by
   a. Morgan & Bridges b. Bateson & Punnett
   c. Sutton & Boveri  d. Schleiden & Schwann
2. The inheritance of fruit colour in *Cucurbita pepo* gives a ratio of
   a. 13:3           b. 12:3:1
   c. 9:7            d. 9:3:4
3. A ratio of 15:1 is observed in
   a. Sweet pea     b. *Cucurbita pepo*
   c. Rice          d. Sorghum

V. PLANT PHYSIOLOGY

1. Cell as a Physiological Unit

Choose the correct answer
1. The protoplasm was considered as a polyphase colloidal system by
2. The movement of water into and out of cells is controlled by
3. Flow of matter from a region of higher concentration to a region of lower concentration is called
   a. Imbibition    b. Osmosis      c. Diffusion  d. Plasmolysis
4. The principle used in pickling is
   a. Imbibition    b. Endosmosis   c. Plasmolysis d. None of the above

2. Water Transport

Choose the correct answer
1. During the day the guard cells experience
   a. exosmosis      b. endosmosis   c. fall in turgor d. loss of water
2. The starch -sugar interconversion theory was given by
3. The relay pump theory was put forward by
4. J.C. Bose gave the
   a. relay pump theory       b. root pressure theory
   c. pulsation theory        d. cohesion - tension theory.

5. Lignin and cellulose have affinity for water. This is called
   a. adhesion                  b. cohesion                  c. root pressure
   d. none of the above

6. The transpiration pull theory was supported by
   a. Renner                     b. Curtis                    c. Clark
   d. All the above

3. Mineral Nutrition

Choose the Correct Answer
1. Hydroponics is otherwise called
   a soil-less agriculture    b tank farming   c chemical gardening        d all the above

2. This element is a constituent of chlorophyll
   a Manganese                  b Magnesium                c Potassium               d Zinc

Fill in the blanks
1. Exanthema is a disease caused due to deficiency of Copper
2. Deficiency of Molybdenum cause Whiptail disease of cauliflower
3. Sulphur containing amino acids is Cystine and cysteine

Match
1. Boron - Translocation of Carbohydrates
2. Sulphur - Thiamine
3. Copper - Reclamation
4. Potassium - Stomatal Movements

3. D. THEORIES OF TRANSLOCATION

Choose the correct answer
1. The theory explaining passive absorption of mineral salts is :
   a. Ion exchange     b. Carrier Concept     c. Cytochrome pump theory     d. None of the above.

2. Contact exchange theory was put forward by :
   a. Jenny and Overstreet       b. Hylmo and Kramer
   c. Bennet and Clark          d. De Vries and Curtis

Fill in the Blanks
1. The bacterium involved in symbiotic nitrogen fixation is Rhizobium
2. The nitrifying bacteria are Nitrosomonas and Nitrobacteria

Match
1. Bacillus ramosus - Ammonification
2. Pseudomonas aeruginosa - Yeast
3. Bennet & Clark - Protein - lecithin carrier
4. Rhodotorula - Denitrification
5. Goldacre - Carrier concept

VI. REPRODUCTION BIOLOGY

1. Reproduction in Angiosperms
   1.(a) Vegetative Propagation

Choose the correct answer
1. In Hibiscus vegetative reproduction takes place by

2. The plant which propagate with the help of its leaves is

Fill in the blanks
1. During grafting the part that becomes the supporting portion is called as Stock
2. A piece of potato tuber can form a new plant if it has Buds (or) Eye spot

2. Sexual Reproduction

2.a. Pollination

Part-I
1. Fragment flowers with well-developed nectaries are an adaptation for -------
   a) Zoophily  
   b) Entomophily  
   c) anemophily  
   d) Hydrophily

2. Hydrophily occurs ------
   a) Vallisineria  
   b) Ceratophyllum  
   c) Hydrilla  
   d) All the above

3. Myrmecophily is a benefical association between some flowering plants and ------
   a) Bats  
   b) Birds  
   c) Ants  
   d) Bees

4. Pollination by bat is called ------
   a) Autogamy  
   b) Chiropterophily  
   c) Homogamy  
   d) Dichogamy

5. If pollen and stigma at different time is called ------
   a) Autogamy  
   b) Cleistogamy  
   c) Homogamy  
   d) Dichogamy

6. Flowers are pollinated by birds in ------
   a) Yucca  
   b) Bombax  
   c) Mango  
   d) Litchi

7. Plants in which pollination takes place inside the bud is ------
   a) Rice  
   b) Oxalis  
   c) Papaya  
   d) Bajra

8. Cross pollination is known as ------
   a) Dichogamy  
   b) Protogamy  
   c) Protandry  
   d) Xenogamy

Choose the correct answer
1. The embryo sac in a typical dicot at the time of fertilization is 
   a. 8 celled  
   b. 6 celled  
   c. 7 celled  
   d. 5 celled

2. Process of fusion between male and egg nuclei are
   a. Syngamy  
   b. Conjugation  
   c. Double fertilization  
   d. Triple fusion

3. Germination of Seed

3.a. Parts of Seed

Choose the correct answer
1. Micropyle occurs in
   a. Ovary  
   b. Seeds  
   c. Ovule  
   d. Both (a) and (c)

2. The Micropyle in a seed helps in the entry of
   a. Water  
   b. Male gamete  
   c. Pollen tube  
   d. None of these

3. Single cotyledon of a monocot seed is
   a. Plumule  
   b. Epicotyl  
   c. Scutellum  
   d. Coleorrhiza

Fill in the blanks
1. Triple fusion occurs between male gamete and Secondary nucleus
2. the outer coat of seed is called Testa

3.b. Types of Seed Germination

Choose the best answer
1. Hypogaeal germination of albuminous seed is seen in
   a. Maize  
   b. Castor  
   c. Gram  
   d. Bean

2. Vivipary is a characteristic feature of
   a. Mesophytes  
   b. Halophytes  
   c. Xerophytes  
   d. Hydrophytes.

3. Germination of the seed is promoted by
   a. Green light  
   b. Red light  
   c. Blue light  
   d. Infra red light

Fill in the blanks
1. The phenomenon of germination of seeds inside the fruit itself is called vivipary
2. The inner thin, membranous, whitish integument seen in dicotyledonous seed is known as Tegmen
3. Albuminous seeds store food materials in Endosperm
3. c. Abscission, Senescence

Choose the correct answer
1. Which one of the following generally increases during senescence?
   a. Protein     b. Chlorophyll    c. Photosynthesis  d. Respiration
2. Senescence of detached leaves can be delayed by the use of
3. Yellowing and shedding of leaves in autumn in many trees is an example of
   a. Over all senescence  b. Deciduous senescence  c. Top senescence  d. Progressive Senescence

Fill in the blanks
1. Cytokinins can **Delay** ageing of plant organs.
2. Leaf fall starts, when the amount of **RNA, Starch, Amino acids (or) Chlorophyll** decreases.

VII. ENVIRONMENTAL BIOLOGY

1. Organisms and their Environment

Fill in the blanks
1. Light is necessary for plants to do **Photosynthesis**
2. Soil provides water and to plants, **Minerals, Salts and Anchorages** to plants

2. Hydrophytes, Mesophytes and Xerophytes

Choose the best answer
1. Finely dissected leaves are common in
   a. Submerged plants   b. Amphibious plants
   c. Free floating plants d. Rooted floating plants
2. The root pockets are present instead of root caps in
   a. Utricularia   b. Eichhornia  c. Hydrilla
   d. Limnophylla

Fill in the blanks
1. Plants that are growing in water are called **Hydrophytes**
2. Plants that are seen in xeric conditions are known as **Xerophytes**

3. Natural Resources

Choose the correct answer.
1. Deforestation may reduce the chances of
   a. Rainfall   b. Landslides  c. Soil erosion  d. Frequent cyclones
2. Soil erosion can be checked by
   a. Wind screen alone  b. Restricted human activity
   c. Checking movement of animals  d. Good plant cover
3. Common sources of energy used in Indian villages is
   a. Electricity b. Sun  c. Coal  d. Wood and animal dung
4. Which of the following is non-renewable?