DSSSB One Liner TGT Science PDF

Q1. Name the scientist and the country of his origin whose field of work was 'elasticity'.
Sol. Robert Hooke, England

Q2. Name the scientist and the country of his origin whose field of work was 'Cosmic rays'.
Sol. Victor Francis Hess, Austria

Q3. Name the scientist and the country of his origin whose field of work was 'measurement of electronic charge'.
Sol. R.A. Millikan, USA

Q4. What is the scientific principle behind 'Aeroplane'?
Sol. Bernoulli's principle in fluid dynamics.

Q5. What is the scientific principle behind 'Optical fibres'?
Sol. Total internal reflection of light.

Q6. What is the range of strong nuclear force?
Sol. Short nuclear size (≈ 10–15 m).

Q7. What is the range of weak nuclear force?
Sol. Very short, sub-nuclear size (~ 10–16 m).

Q8. What is the range of gravitational and electromagnetic force?
Sol. Infinite

Q9. Name the physicist who showed that the same laws of motion and the law of gravitation apply to celestial and terrestrial mechanics.
Sol. Isaac Newton

Q10. Who predicted the existence of a new particle called neutrino (emitted in β-decay of a nucleus) using the conservation laws of energy and momentum?
Sol. Wolfgang Pauli (1900–1958) in 1931.

BIOLOGY

Q1. Select the mismatched pair.

Sol. Rudolf Virchow modified the cell theory and gave it a final shape.

Q2. A specialised extension of prokaryotic cell membrane, which help in respiration and secretion processes is called

Sol. Mesosomes are specialised extension of plasma membrane that help in respiration, secretion and replication of DNA.

Q3. Outermost covering of cell envelope which provides protection and helps in cell adhesion, is

Sol. Glycocalyx is the outermost covering of bacterial cell that help in cell adhesion as well as protect it from host immune system.

Q4. Animal cells are different from plant cells in presence of

Sol. Animals, protists, fungi and lower plants possess centrioles while higher plants lack centriole.

Q5. Select the incorrect match.

Sol. Thickness as well as composition of glycocalyx differ in bacteria.

Q6. The structure which confers certain unique phenotypic characters to bacteria but is not vital for survival, is

Sol. Plasmid DNA confers extra phenotypic characters to bacteria such as antibiotic resistance.

Q7. Match items of Column-I with Column-II.

Column I	**Column II**
a. Middle lamellae	(i) Transport of molecules
b. Cell membrane	(ii) Connect the cytoplasm of neighbouring cell
c. Plasmodesmata	(iii) Resistance to antibiotics
d. Plasmid	(iv) Jointly secreted by daughter cells

Sol. Middle lamella – Jointly secreted by daughter cells Plasmodesmata – Connects the cytoplasm of neighbouring cells.

Q8. Consider the following statements and choose correct option. A – During different stages of cell division, cells have chromosomes in place of nucleus. B – Chromatin contains DNA, some basic proteins, non-histone proteins and RNA

Sol. Chromatin essentially contain DNA & basic histone proteins.

Q9. Somatic pairing is a characteristic feature of

Sol. Polytene chromosomes show somatic pairing.

Q10. Secondary lysosomes containing undigested substances are called

Sol. Residual bodies – Secondary lysosomes with undigested waste.

Q11. How many of the features given in the box are associated with mitochondria? Single circular DNA molecule; RNA; 70S aerobic respiration; carbon assimilation, detoxification of drugs ribosomes

Sol. Single circular DNA RNA Mitochondria 70S ribosomes Aerobic respiration Carbon assimilation – Chloroplast Detoxification of drugs – SER

Q12. Which of the following is not a property of cell membrane?

Sol. Proteins due to their larger size cannot show flip-flop movement.

Q13. Packaging of materials and their delivery either to the intracellular targets or outside the cell is principally performed by

Sol. Processing and packaging of materials is the function of golgi apparatus.

Q14. Nucleolus is the site of synthesis of ribosomal subunits which includes

Sol. Nucleolus synthesises 80S ribosomal sub-units.

Q15. Match the following.

Column I	**Column II**
a. Microfilaments	(i) Formation of spindle fibres
b. Microtubules	(ii) Formation of pseudopodia
c. ER	(iii) Formation of desmotubules
d. Lysosome	(iv) Digestion of proteins

Sol. Microfliaments – pseudopodia formation ER – formation of desmotubules

Q16. Dictyosome is

Sol. Unconnected units of cisternae in plants – Dictyosomes

Q17. A chromosome with the centromere situated close to its end forming one extremely short and one very long arm is called as

Sol. Acrocentric chromosomes – One very long arm One very short arm

Q18. A nuclear pore allows

Sol. Nuclear pore allows movement of RNA and proteins from nucleus to cytoplasm or vice-versa.

Q19. Which of the following microbodies helps to secrete hydrolytic enzymes during seed germination?

Sol. Sphaerosomes secrete hydrolyzing enzymes.

Q20. Select the incorrect match. Organelles Function

Sol. Fimbriae – help in attachment of cell to the substratum/host.

Q21. Both chloroplast and mitochondria show similarity in presence of

Sol. Chloroplast and mitochondria both have 70S ribosomes.

Q22. Aleuroplasts, amyloplasts and elaioplasts

Sol. Aleuroplast – Store protein Amyloplast – Store starch Elaioplast – Store fat

CELL DIVISION

Q1. When viewed under the microscope, cells do not show golgi complexes, endoplasmic reticulum, nucleolus and nuclear envelope during

Sol. At the end of prophase cells do not show golgi complex, ER, nucleolus and nuclear membrane.

Q2. Homologous chromosomes separate, while sister chromatids remain associated at their centromeres during

Sol. Anaphase I – homologous chromosomes separate.

Q3. Select the events which occur twice during meiosis.
a. Nuclear division
b. Division of cytoplasm
c. DNA replication d. Bivalent formation
e. Equational division

Sol. DNA replication, bivalent, formation and equational division occur once in meiosis.

Q4. The method of asexual reproduction which occurs in organisms like bacteria, protozoans and diseased cells is

Sol. Amitosis

Q5. The appearance of recombination nodule occurs during

Sol. Pachytene – Recombination nodule/crossing over

Q6. Condensation of chromosomes is completed and they can be observed clearly under the microscope in

Sol. Metaphase – Chromosomes are thickest.

Q7. Following are the important events for telophase, except

Sol. Individuality of chromosomes is lost in telophase.

Q8. The formation of the new cell wall begins with the formation of simple precursor, called the

Sol. Formation of new cell wall begins with cell plate.

Q9. Which of the following chemicals act as mitogens?

Sol. Insulin & gibberellin – mitogens. Rest all are mitotic poisons.

Q10. A stage of mitosis is shown in the diagram. Which stage is it and what are its characteristics?

Sol. Transition to metaphase.

Q11. At which stage of meiotic cell cycle, chiasmata can be observed?

Sol. Chiasmata formation occur in diplotene stage.

Q12. In which of the following stage, cells remain metabolically active but no longer proliferate unless called on to do so depending on the requirement of the organism?

Sol. G0 -quiescent stage (metabolically active but do not proliferate)

Q13. The centromere splits during

Sol. Centromere splits – Anaphase II

Q14. Longest phase of meiosis I is

Sol. Prophase I – longest phase of meiosis I.

Q15. Restorage of nucleocytoplasmic ratio is performed in

Sol. M-phase (mitosis) – restore nucleocytoplasmic ratio.

Q16. The complete disintegration of nuclear envelope marks the

Sol. Complete disintegration of nuclear membrane marks the beginning of metaphase.

Q17. Choose correct statement regarding meiosis from given statements.
(i) Each pole receives half of the total chromosome number of the parent cell during anaphase-I
(ii) Anaphase–II involves separation of chromatids
(iii) DNA synthesis takes place in interkinesis stage

Sol. Interkinesis do not show DNA synthesis.

Q18. Match column-I with column-II :

Column I	Column II
a. G1 - phase	(i) Quiescent stage
b. S - phase	(ii) Protein synthesis
c. G2 - phase	(iii) DNA synthesis
d. G0 - phase	(iv) Most of the organelles duplicate

Sol. G1 phase – most of the cell organelles duplicate. S phase – DNA synthesis

Q19. Consider the following statements :
A – Meiosis-II resembles to normal mitosis
B – Meiosis ensures the production of haploid phase in the life cycle of sexually reproducing organisms

Sol. Meiosis produces haploid gametes that after fusion form diploid organisms.

Q20. Select the correct sequence of events taking place during mitotic anaphase. A – Chromatids separate B – Centromeres split C – Chromatids move to opposite poles

Sol. B $\rightarrow$ A $\rightarrow$ C

Q21. Cytokinesis in animal cell takes place by

Sol. In animal cells cytokinesis is centripetal.

Q23. A typical diploid cell of maize root has 20 chromosomes. How many chromosomes will be present in the cell at G1 phase, after S-phase and after M phase respectively?

Sol. G1 = 20, S = 20, M - 20 as mitosis is an equational division

Q24. Which of the following is correct for cell division in higher plants?

Sol. Higher plants lack centriole and asters.

Q25. In which method of cell division there is no formation of spindle fibre and distinct chromosome?

Sol. Amitosis or direct cell division – lack spindle fibres.

LIVING WORLD

Q1. Read the following statements and select the correct ones for all living organisms :

a. Reversible increase in body mass by accumulation of symplasmic materials from outside

b. Intrinsic growth

c. Growth and reproduction are mutually inclusive events in multicellular organisms

d. All non-living objects are capable of replicating themselves

e. Cellular organisation of the body is defining property

Sol. Living organisms show intrinsic growth. Growth and reproduction are mutually exclusive events in multicellular organisms. No non living objects can replicate themselves.

Q2. The most obvious and technically complicated feature of life is

Sol. It is sensitivity or consciousness.

Q3. How many features listed below are exhibited by flatworms A and bacteria B?

i. Growth by increase in mass only

ii. Regeneration iii. Self-consciousness

iii. Anabolism & catabolism

iv. Binary fission

Sol. Self consciousness is shown by humans only.

Q4. Genus comprises a group of related species which has ____ characters in common in comparison to species of _____.

Sol. As we move down to the taxonomic hierarchy from kingdom to species, number of common characteristics increases.

Q5. Plants families are characterised on the basis of

a. Shape and colour of leaves only

b. Vegetative characters

c. Reproductive features

Sol. Plant families are characterised on the basis of both vegetative and reproductive characters.

Q6. Polymoniales and Poales belong to ORDERS CLASS DIVISION

Sol. Polymoniales Dicotyledonae Angiospermae Poales Monocotyledonae

Q7. Taxonomical aids that help in the preservation of angiospermic plant specimens on sheets for study and reference, is

Sol. Herbarium contains pressed, dried and preserved plant specimens.

Q8. Which one of the following is based on the set of two contrasting characters in identification process?

Sol. Key has contrasting characters called couplet and every sentence of couplet is lead.

Q10. Growth and reproduction are mutually exclusive events for

Sol. Growth and reproduction are mutually exclusive events for multicellular organisms.

Q11. Living organisms are self-regulating interactive systems and it results in emergent properties at higher level of organisation. In support of this which of the following is correct?

a. Properties of tissues are present in the constituent cells
b. Properties of cell organelles arise from their molecular constituents of the organelle
c. Properties of tissues are not present in the constituent cells

Sol. Properties of tissues are not present in their constituent cells, they arise by interaction among themselves.

Q12. Consider the following properties and select features for A - Bacteria and B - Human beings.

a. Growth and reproduction as inclusive events
b. Intrinsic growth
c. Cellular body organisation
d. Tissue and organs level body organisation
e. Self-consciousness A B

Sol. Bacteria – Unicellular Humans – Multicellular Self consciousness is shown by humans only.

Q13. Scientific names of plants are based on agreed principles and criteria which are provided in

Sol. ICBN – International Code for Botanical Nomenclature.

Q14. Which one of the following is correct binomial epithet for mango?

Sol. Mangifera indica Linn. ↓ ↓ ↓ Italics Italics Non italics Generic name specific epithet Author's name in abbreviated name ↓ ↓ Starts with capital letter Starts with small letter

Q15. Taxa like sweet potato and mango are placed in taxonomic hierarchy in the

Sol. Names Orders Class Division Potato Polymoniales Dicotyledonae Angiospermae Mango Sapindales

Q16. Select the correct statement for genus.
Sol. A genus which includes many species has more characters in common in comparison to species of other genera.

Q17. Solanum, Petunia and Datura are placed in next higher category A on the basis of B characters.
Sol. Genera Family Solanum Petunia Datura

Q18. Hominidae is equivalent to which category in taxonomic hierarchy of mango?
Sol. Scientific name Family Mango → Mangifera indica Anacardiaceae

Q19. The category with related orders is represented by
Sol. Next higher category to order is class. Dicotyledonae and monocotyledonae} classes

Q20. Greater is the difficulty of determining the relationship to other taxa at the same level at
Sol. At higher categories, greater is the difficulty of determining the relationship to other taxa at the same level.

Q21. How many procedures/techniques are developed to store and preserve the specimens for future studies? Herbarium, Zoos, Museum, Flora, Botanical gardens, Manuals
Sol. Herbarium and museum.

Q22. The taxonomical aid used for identification of plants and animals based on the similarities and dissimilarities
Sol. Keys are generally analytical in nature.

Q23. Ex-situ conservation strategies of live specimens where each specimen is labelled indicating its scientific name and its family, are
Sol. Museum – Preserved specimens Monograph Description of specimens Manual

Q24. Scientific names of Ulothrix and flatworm have been standardised by
Sol. Ulothrix – Green alga – ICBN Flatworm – Animal – ICZN

Q25. Modern taxonomic studies do not deal with
a. External Structure
b. Structure of cell
c. Internal structure
d. Phylogeny
e. Ontogeny
f. Chemotrophic Nutrition

Sol. Phylogeny and chemoautotrophic mode of nutrition is not included in modern taxonomic studies.

Q26. Consider the following taxa and select how many of them do not belong to the lowest category of taxonomic hierarchy? Chilli, Lion, Dicots, Animals, Mango, Sweet potato, Polymoniales, Cat
Sol. Dicots – Class Polymoniales – Order Animals – Kingdom

Q27. Genera like Petunia and Mangifera and placed in
Sol. Genera Order Class Polymoniales Dicotyledonae Sapindales Petunia Mangifera

Q28. Systematics differ from taxonomy in considering
Sol. Systematics = Taxonomy + Phylogeny

BIOLOGICAL CLASSIFICATION

Q1. Two kingdom system did not differentiate between
(a) Organisms with non-cellulosic cell wall and cellulosic wall.
(b) Organisms with and without cell wall.
(c) Neurospora and Ulothrix.
(d) Fungi & Angiosperms.

Sol. Two kingdom classification system was based on presence of cell wall. But it did not differentiate between autotroph, heterotrophs, unicellular and multicellular organisms.

Q2. Eubacteria having chlorophyll a similar to green plants are

Sol. Cyanobacteria have chlorophyll similar to green plants.

Q3. Evolutionary relationship was one of the criteria/basis for giving

Sol. Five kingdom classification system includes phylogenetic relationship as a criteria to classify organisms.

Q4. Chlorophyllous organisms evolving O2 in photosynthetic process are included in total how many kingdoms of Whittaker's system?

Sol. Monera (BGA) Pr otista Plantae Includes photosynthetic & O2 evolving organisms

Q5. A specialised vegetative cell for nitrogen fixation in Nostoc

Sol. Heterocyst – thick walled, impervious to gases & anaerobic.

Q6. Which of the following pair is incorrectly matched w.r.t. archaebacteria?

Sol. Methanogen – obligate anaerobes.

Q7. Which of the following bacteria are able to oxidise various inorganic substances and use the released energy for their ATP production?

Sol. Chemoautotrophs – oxidise inorganic substances and use released energy for ATP formation eg. sulphur bacteria.

Q8. Chief producers in the oceans show/have
a. Passive floating nature
b. Stiff cellulose plates on the outer surface
c. Two thin overlapping shells
d. Different colouration depending on the main pigments.

Sol. Diatoms – Chief producer in the ocean They are golden brown protist

Q9. Intervening dikaryophase is absent in sexual life cycle of

Sol. Rhizopus (Zygomycete) lack dikaryophase in their life.

Q10. In which class of fungi, most of the members are decomposers of litter?
Sol. Deuteromycetes members are good decomposer of litters.

Q11. Viruses do not find any position in the five kingdom system because of
(a) Infectious nature
(b) Non-cellular structure
(c) Obligate parasitism
(d) Nucleio-protein structure
(e) Multiplication inside the host
Sol. Viruses are non cellular in nature therefore do not find any position in five kingdom system.

Q12. _____ demonstrated that the extract of the infected plants of tobacco could cause infection in healthy plants.
Sol. M.W. Beijerinck – Contagium vivum fluidum.

Q13. Select the correct statement w.r.t. kingdom fungi.
(a) Show diversity in habitat
(b) Loose tissue level body organisation
(c) Complete absence of cellulosic cell wall
(d) Includes prokaryotes and eukaryotes
(e) Diversity in morphology of mycelium
Sol. Fungi show great diversity is habitat and structure of mycelium. All fungi are eukaryotes. Members of oomycetes have cellulosic cell wall.

Q14. In most of the plant viruses, the infectious material is
Sol. Phytophaginae /Plant viruses- ssRNA mostly.

Q15. Fungi with coenocytic mycelium are characterised by
Sol. Coenocytic mycelium- Oomycetes and zygomycetes. They form endogenous asexual spores eg. sporangiospores.

Q16. Which one of the following characters is not a criterion for the classification of fungi?
Sol. Cell wall composition is not a criterion for classification of fungi as most of them have chitinous cell wall.

Q17. Find the correct match.

Column I	**Column II**
a. Penicillium	(i) Zygospore
b. Rhizopus	(ii) Conidia
c. Ustilago	(iii) Ascospore
d. Colletotrichum	(iv) Basidiospore

Sol. Penicillium - Ascospores Ustilago - Basidiospore

Q18. Archaebacteria show similarity with Mycoplasma in having
Sol. Both archaebacteria and mycoplasma have 70 S ribosomes.

Q19. The correct statement for Lichens are
(a) Slow growing perennials
(b) Symbionts of only prokaryotic autotrophs and eukaryotic heterotrophs
(c) Major algal components are green algae
(d) Reproduce usually by motile spores

Sol. Phycobiots of lichens - BGA or member of Chlorophyceae. They reproduce by fragmentation and nonmotile spores.

Q20. Long lived Fuse Hyphae(n) Dikaryotic stage (n + n) ⟶ Karyogamy Meiosis Diploid Haploid condition spores ⟶ ⟶ Above sequence of life cycle is associated with members of

Sol. Long dikaryophase is a feature of club fungi.

Q21. Read the following statements and choose the correct ones.
A. Mycoplasma can have double or single stranded DNA.
B. Penicillin is not effective against wall-less bacteria.
C. Bacteria show complex structure and simple behaviour.
D. N2 fixing bacteria can be photosynthetic or heterotrophic.

Sol. A. Mycoplasma have only ds DNA. D. Bacteria are simple in structure but complex in behaviour.

Q22. Red tides forming members

Sol. Dinoflagellates form red tides. They have heterokont flagella (dissimilar)

Q23. Nostoc is

Sol. Nostoc is a filamentous BGA. It has heterocyst with PSI only. They form bloom is polluted water bodies.

Q24. Archaebacteria differs from eubacteria in

Sol. Archaebacteria lack peptidoglycan is their cell wall.

Q25. Coenocytic mycelium is present in

Sol. Phycomycetes member have coenocytic mycelium. Eg. Albugo, Rhizopus, Phythium

Q26. Slime moulds undergo aggregation

Sol. Under favourable conditions slime moulds aggregate to form plasmodium.

Q27. Find the correct match

Column I	Column II
a. Coprophilous fungi	(i) Rhizopus
b. Thick walled diploid sexual spore	(ii) Trichoderma
c. Fruiting body with haploid exogenous sexual spore	(iii) Mucor
d. Imperfect fungi	(iv) Agaricus

Sol. Coprophilous fungi - Mucor Imperfect fungi - Trichoderma

Q28. Lichens are symbiotic association of

Sol. Lichen – Autotroph + Heterotroph (fungi) BGA (prokaryote) Green algae (eukaryote)

MORPHOLOGY OF FLOWERING PLANTS

Q1. Which of the following region of root possess small cells with dense cytoplasm?
Sol. Meristematic zone has small cells with dense cytoplasm.

Q2. Adventitious roots developing from stem branches and provide extra mechanical support to the plant are observed in
Sol. Ficus benghalensis (banyan tree) has prop roots which provide mechanical support to the plant.

Q3. Thin, slender and spirally coiled structures called stem tendrils
Sol. Tendrils develop from axillary bud and can be seen in grapevines and pumpkins.

Q4. Short horizontal branch producing a rosette of leaves and a tuft of roots at each node, are found in
Sol. It is offset, found in Pistia and Eichhornia.

Q5. Leaflets tendrils are found in
Sol. Leaflet tendrils are found in Garden Pea. Cucumber Watermelon Stem tendrils

Q6. Racemose inflorescence is characterised by
Sol. Racemose inflorescence has indefinite growth, acropetal arrangement of flowers and no terminal flower.

Q7. Match the following columns (w.r.t. aestivation of corolla).

Column-I	**Column-II**
(a) Valvate	(i) Cassia
(b) Imbricate	(ii) Pea
(c) Twisted	(iii) Calotropis
(d) Vexillary	(iv) Cotton

Sol. Valvate – Calotropis Imbricate – Cassia Twisted – Cotton Vexillary – Pea

Q8. Primary root is short lived and is replaced by a large number of roots in
Sol. Maize (monocot) has fibrous roots.

Q9. Roots in Rhizophora
Sol. Rhizophora has pneumatophores which grow vertically upward.

Q10. Read the following statements w.r.t. stem and identify them as true(T) or false(F).
A. Ascending part of plant
B. Main function is storage of food
C. Generally green when older but brown when young.
D. It may perform function of vegetative propagation.
Sol. Stem gives mechanical support to plant. It is generally green when young and becomes brown when it is older.

Q11. All the given plants have underground stems performing function of perennation, except
Sol. Cucumber and watermelon are weak plants, grow above the soil surface.

Q12. Match the following leaf modifications with their functions.

Leaf modification	Function
A. Tendrils	(i) Protection
B. Spines	(ii) Climbing
C. Phyllode	(iii) Trapping insects
D. Leaf pitcher	(iv) Photosynthesis

Sol. Tendrils – Help in climbing Spines – Help in protection Phyllode – Perform photosynthesis Leaf pitcher – Trap insects

Q13. Indefinite inflorescence is not found in

Sol. Indefinite inflorescence is found in racemose inflorescence. Solanum } Cymose inflorescence Radish Mustard Racemose infloresence Wheat

Q14. Which of the following family has trimerous flowers?

Sol. Monocot families (Liliaceae) have trimerous flowers.

Q15. The mode of arrangement of sepals or petals in floral bud with respect to the other members of the same whorl is known as

Sol. Inflorescence is arrangement of flowers on main axis. Aestivation is arrangement of sepals or petals in floral bud with respect to the other members of the same whorl.

Q16. C1 + 2 + (2) represents

Sol. C1 + 2 + (2) is papilionaceous corolla present in pea family. It shows vexillary aestivation.

Q17. Two plants A and B belonging to different families show following features Plant A – Zygomorphic, bisexual flowers with non-endospermic seed Plant B – Persistant calyx, epipetalous stamen and axile placentation Identify these plants.

Sol. Plant A – Pea family → Soyabean (Fabaceae) Plant B – Potato family → Tobacco (Solanaceae)

Q18. Which of the following represents a pair of fiber crop and a medicinal plant respectively?

Sol. Crotalaria - Fiber crop Withania - Medicinal plant

Q19. The feature which is not seen in maize seed is

Sol. In monocot seeds (maize) the plumule and radicle are enclosed by coleoptile and coleorhiza respectively.

Q20. The scar on seed coat through which developing seeds are attached to the fruit is

Sol. Hilum is scar on seed coat.

Q21. Which of the following fruit arises from monocarpellary superior ovary?

Sol. Mango arises from monocarpellary superior ovary.

Q22. Find the correctly matched pair w.r.t. family Brassicaceae Solanaceae Fabaceae Liliaceae Tetradynamous stamens Persistent calyx Diadelphous condition Tetramerous flower Monocarpellary gynoecium Endospermic seed Fruit berry Epipetalous stamens

Sol. Members of Solanaceae have persistent calyx and endospermic seeds.

Q23. Match the column w.r.t. placentation Placentation Example

a. Axile	(i) Primrose
b. Parietal	(ii) Soyabean
c. Marginal	(iii) Tulip
d. Free-central	(iv) Argemone

Sol. Axile – Tulip Parietal – Argemone Marginal – Soyabean Free-central – Primrose

Q24. Which of the following symbols stands correct for the Solanaceae family?

Sol. C(5) A5 → Epipetalous condition is seen in family Solanaceae.

Q25. Read the following statement carefully. "Plants are trees, shrubs and herbs, erect or climber and have reticulate venation in leaf with pulvinate leaf base." Identify the plant family described above

Sol. Fabaceae family has pulvinate leaf base. Ground nut is a leguminous plant.

Q26. Bilateral symmetry of flower is seen in

Sol. Pea shows bilateral symmetry.

Q27. Stilt roots

a. Arise from lower nodes of stem
b. Provide support as they are hanging from branches
c. Present in maize and sugarcane
d. Are modified to help in gaseous exchange

Sol. Stilt roots arise from lower nodes of stem. They provide mechanical support to the maize and sugarcane.

Q28. Find the incorrectly matched pair w.r.t. leaf.

Sol. Alstonia – Whorled phyllotaxy

ANATOMY OF FLOWERING PLANTS

Q1. In grass, regeneration of parts removed by grazing herbivore, is done by

Sol. Intercalary meristem occurs between mature tissues which helps in regeneration of parts removed by grazing herbivores.

Q2. Thick lignified walls are not present in

Sol. Thick lignified walls are present in all components of xylem except xylem parenchyma.

Q3. Which of the following is not the function of a simple tissue that forms main component within the organs?

Sol. Parenchyma forms the major component of the plant and it cannot provide mechanical support to the plant.

Q4. Find the correctly matched pair
A. Companion cells – Maintain pressure gradient in the sieve tubes
B. Collenchyma – As patches below epidermis in monocot stem
C. Fibers – Longest cells of plant which generally occurs in group
D. Phloem parenchyma – Is absent in most monocots
E. Sieve tube elements – Peripheral cytoplasm with large central vacuole and prominent nucleus
Sol. Collenchyma is absent in most monocots. Sieve tube elements lack nucleus.

Q5. Match the following columns and choose the correct option

Column I (Tissue system)	Column II (Associated structures)
a. Epiblema	(i) Two epidermis covered by cuticle
b. Leaf epidermis	(ii) Unicellular elongations
c. Stem epidermis	(iii) Ion regulated valves for gaseous exchange
	(iv) Parenchymatous with small amount of cytoplasm

Sol. a. Epiblema (Root epidermis) – Unicellular elongations and Parenchymatous. b. Leaf epidermis – Parenchymatous, two epidermis covered by cuticle and has valves for gaseous exchange. c. Stem epidermis – Parenchymatous

Q6. I. The specialised cells present in vicinity of guard cells are known as A II. Ground tissue of leaves is called B III. Cuticle is absent in C IV. D help in preventing water loss due to transpiration
Sol. Subsidiary cells are specialised cells present in vicinity of guard cells. Ground tissue of leaves is called mesophyll.
Cuticle is absent in Root.

Q7. The following vascular bundle is present in
Sol. Root has radial vascular bundles. In dicots (Mustard) xylem is tetrach.

Q8. Anatomy of a plant organ was observed. It shows presence of protoxylem towards centre and metaxylem towards periphery of organ; cambium is present between xylem and phloem. The plant organ is
Sol. Monocot – cambium absent. Dicot stem shows endarch condition of xylem.

Q9. Starch sheath is starch rich
Sol. Endodermis of dicot stem is called starch sheath as it is rich in starch grains.

Q10. How many of the given structures/tissues are completely secondary in origin? Earlywood, Leaves, Lenticels, Cork, Autumn wood, Late bark, Flowers
Sol. Leaves & flowers – Primary in origin.

Q11. Spring wood is different from autumn wood in
Sol. Spring hood has large number of xylary elements. It is lighter in color and has wider lumens of vessels.

Q12. Light coloured peripheral region of secondary xylem
Sol. Sap wood is light colored peripheral region which helps in conduction of water.

Q13. Lens shaped opening in cork region
Sol. Lenticels are lens shaped openings which help in gaseous exchange.

Q14. The only living component of water conducting tissue is/has
Sol. Xylem parenchyma is the only living component of water conducting tissues i.e. xylem.

Q15. When xylem and phloem within a vascular bundle are arranged in an alternate manner on different radii, the arrangement is called
Sol. Radial vascular bundles are seen in roots.

Q16. Palisade parenchyma in leaf is/has
Sol. Palisade parenchyma has elongated cells towards the adaxial surface of epidermis. It has chloroplasts.

Q17. Bulliform cells
A. Are large, empty, colourless cell.
B. Are modified adaxial epidermal cells present along veins.
C. Make the leaves curl inwards. D. Minimise water loss
Sol. Bulliform cells are large, empty and colourless.

Q18. In dicot stem, narrow band of parenchyma which passes through the secondary xylem and secondary phloem in the radial direction
Sol. Medullary rays are formed by cambial ring.

Q19. First event during secondary growth in dicot root is
Sol. During secondary growth in dicot roots dedifferentiation of conjuctive parenchyma takes place.

Q20. Guard cells I. Are always bean-shaped and enclose stomatal pore. II. Have differential thickening in their walls and possess chloroplast.
Sol. Guard cells can be bean shaped/kidney shaped in dicots or dumb-bell shaped in monocots.

Q21. Sclerenchyma fibres
(a) Are thick walled, elongated and pointed
(b) Occur in various parts of plants and generally occur in groups
(c) Provide mechanical support to the organs
Sol. Sclerenchyma fibres are dead, thick walled and provide mechanical support to plants.

Q22. The trichomes in the shoot system
Sol. The trichomes in the shoot system are usually multicellular. They may be branched or unbranched.

Q23. Pericycle in dicot roots
Sol. Pericycle in dicot root dedifferentiates to form the cambium.

Q24. Biological check-post in roots of angiosperm is
Sol. Endodermis is biological check point which checks the entry of type of solute beyond it.

Q25. Vascular bundles in leaves are
Sol. Vascular bundles in leaves are conjoint & closed.

PLANT KINGDOM

Q1. Natural classification system is better than artificial system due to all the given reasons, except
Sol. Based on external as well as internal features

Q2. Red algae reach the maximum depth in sea water where no other type of photosynthetic organisms grow. This is due to the abundant formation of
Sol. Dominant phase is gametophyte and forms gametes.

Q3. Artificial classification system based on androecium structure was given by
Sol. Linnaeus

Q4. True heterospory was first seen in plant group which is
Sol. Pteridophytes

Q5. Non-archegoniates embryophytes are
Sol. Angiosperm lack archegonia.

Q6. Life cycle of Ficus is
Sol. Diplontic

Q7. Sporophytic generation is represented by single cell in
Sol. Zygote represent sporophytic generation.

Q8. Bryophytes show resemblance with algae in
(a) Formation of motile sperms
(b) Absence of vascular tissues
(c) Presence of haploid gametophyte
Sol. All (a), (b) and (c)

Q9. Which of the following is correct sequence of steps involved in life cycle of liverworts if we start it from its dominant phase? [A - Meiosis, B - Gametogenesis, C - Gametophyte, D - Syngamy, E - Zygote, F - Sporophyte, G - Spore]
Sol. $C \rightarrow B \rightarrow D \rightarrow E \rightarrow F \rightarrow A \rightarrow G$

Q10. Consider the following statements w.r.t mosses and select the correct option.
a. The sporophyte is less elaborate than that of liverworts.
b. Zygote develops into green filamentous structure.
c. Sex organs are produced at the apex of the leafy shoots.
d. Leafy stage is developed from secondary protonema.
Sol. Mosses have more elaborate sporophyte than liverworts. Zygote form embryo in mosses.

Q11. In liverworts, gemmae are
Sol. Green, multicellular

Q12. Which of the following brown algae have massive plant bodies?
Sol. Kelps have massive plant bodies.

Q13. In which of the following the female gametophyte is retained on the parent sporophytes for variable periods?
Sol. Heterosporous pteridophytes

Q14. Which of the following feature(s) of Pinus help to tolerate or withstand extreme conditions?
Sol. Pinnate leaves – found in Cycas.

Q15. Select the common feature amongst Ginkgo, Selaginella and Sphagnum.
Sol. They all have archegonia.

Q16. Which of the following are heterosporous with dependent male and female gametophyte?
Sol. Cycas, Pinus and Ginkgo

Q17. Chemotaxonomy is based on
Sol. Chromosome structure – Cytotaxonomy

Q18. Which of the following event is unique to angiosperms?
Sol. Triple fusion

Q19. Complexity in body organisation is maximum in 'a' and complex post-fertilization changes are seen in 'b' .
Sol. a – Brown algae; b – Red algae

Q20. Similarity among characters of different organisms is determined by using various statistical formula in
Sol. Numerical taxonomy

Q21. Agar producing genera of rhodophyceae are
Sol. Gelidium, Gracilaria

Q22. Homosporous plant is
Sol. Lycopodium – homosporous

Q23. Gymnosperms are more advanced than pteridophytes. Which of the following features of gymnosperms, justify this statement?
Sol. Gymnosperms have seed while pteridophytes do not.

Q24. Pollen tube is carrier of non-motile male gamete in
Sol. Ficus is an angiosperm.

Q25. Dioecious liverwort is
Sol. Marchantia

Q26. Which of the following is not a feature of pteridophytes?
Sol. Pteridophytes have differentiated vascular tissues.

TRANSPORT IN PLANTS

Q1. Both facilitated transport and active transport are
Sol. Active transport is uphill transport and requires energy. Both are dependent on sperial membrane proteins.

Q2. The greater the concentration of water in a system, the greater is its
Sol. Lowering of water potential is solute potential.

Q3. If the external solution balances the osmotic pressure of the cytoplasm it is said to be
Sol. Isotonic

Q4. Which of the following external factors affect the rate of transpiration? a. Light b. Vapour pressure gradient c. Temperature d. Number of stomata e. Root shoot ratio f. Abscisic acid
Sol. Number of stomata, root shoot ratio and ABA are plant factors.

Q5. If pressure greater than atmospheric pressure is applied to a solution, its water potential :
Sol. Increases

Q6. A special type of diffusion when water is absorbed by solids, colloids causing them to enormously increase in volume is called
Sol. Imbibition

Q7. The symplastic system is
Sol. Symplastic system is a living system which is connected through plasmodesmata.

Q8. Two molecules cross through carrier proteins of membrane in the same direction is
Sol. Symport

Q9. Which of the following plant factors affect the rate of transpiration?
Sol. Canopy structure and waxy coating

Q10. Find out the correct direction for the flow of water in the given system. $\Psi s = -12$ $\Psi p = 9$ $\Psi w = -12$ OP = 12 TP = 7 A B C
Sol. Cell A, $\Psi w = \Psi s + \Psi p = -12 + 9 = -3$ Cell B, $\Psi w = -12$ Cell C, DPD = OP – TP DPD = 12 – 7 DPD = 5 $\Psi w = -5$ Water moves from high to low water potential.

Q11. What will be the value of Ψw for a flaccid cell if its osmotic pressure is 25 bars?
Sol. For flaccid cell $\Psi p = 0$. Hence, $\Psi w = \Psi s + \Psi p \Rightarrow \Psi w = -25$

Q12. In stomata, the cellulosic microfibrils of the cell wall of guard cell are oriented
Sol. Radially

Q13. Which value will go on increasing if a flaccid cell is placed in hypotonic solution?

Sol. More the amount of solutes, more high is the solute potential.

Q14. The apoplast system is continuous throughout the plant except which one of the following tissues in the roots?

Sol. Endodermis

Q15. During high rate of transpiration

Sol. Water is lost during transpiration. Hence Ψw decreases.

Q16. Girdling experiment was used to prove that

Sol. Phloem translocates food in one direction

Q17. Consider the following statements (a-d) each with one or two blanks

a. Numerically	(i) is equivalent to the osmotic potential but the sign is opposite.
b. The water potential of	(ii) at standard temperatures, which is not under any pressure, is taken to be zero.
c. Minerals are present in the soil as charged particles which	(iii) move across cell membranes.
d. The movement of water through the root layers is ultimately	(iv) in the endodermis.

Which one of the following options, gives the correct fill ups for the respective blank numbers from (i) to (iv) in the statement?

Sol. (i) Osmotic pressure (iii) Cannot (ii) Pure water (iv) Symplastic

Q18. Consider the following properties : (a) Highly selective in nature (b) Transport saturates (c) Uphill transport (d) Movement of transport proteins (e) Requires ATP energy (f) Need of special membrane proteins In how many of the features, active transport is different from facilitated diffusion?

Sol. (c), (d), (e) are seen in active transport only

Q19. Which of the following is/are the sinks for the mineral elements? a. Apical meristem b. Young leaves c. Developing flowers

Sol. All a, b and c

Q20. Which of the following is not correct w.r.t. mass flow hypothesis?

Sol. At sink OP is low.

Q21. Deplasmolysis occurs due to

Sol. Endosmosis of water

MINERAL NUTRITION

Q1. Hydroponics

Sol. Is a technique of growing plants in a nutrient solution in the complete absence of soil

Q2. Which of the following is not the criteria for essentiality of a mineral element?

Sol. The element must not be absolutely necessary for normal plant growth and development

Q3. The first phase of mineral uptake during influx
(I) Involves apoplast
(II) Occurs through ion-channels
(III) Is a rapid process

Sol. All are correct

Q4. The second phase of mineral ions movement during influx is

Sol. Second phase is metabolic phase.

Q5. Best defined function of Manganese is

Sol. Mn++ – Splitting of water

Q6. The concentration of the essential element below which plant growth is retarded is termed as

Sol. Critical concentration

Q7. The enzyme exclusively present in prokaryotes and capable of nitrogen reduction is

Sol. Nitrogenase

Q8. How many ATP are required for production of 10 NH_3 molecules in biological nitrogen fixation?

Sol. For 1 NH_3 = 8 ATP, for 10 NH_3 = 8 × 10 = 80 ATPs

Q9. Which of the following amino acid can give rise to other amino acids by transamination?

Sol. Glutamic acid

Q10. The pink coloured pigment produced in root nodules of leguminous plant

Sol. Leghaemoglobin is produced by plant & bacteria both.

Q11. Choose the correct match. Element Absorbed as

Sol. Boron – BO_3^{3-}

Q12. The element which is a constituent of the ring structure of chlorophyll and the element involved in opening and closing of stomata are, respectively

Sol. Mg – in porphyrin ring of chlorophyll K – opening & closing of stomata

Q13. Which of the following is not related to mineral element - Zn?

Sol. B – translocation of carbohydrate.

Q14. Reductive amination does not require

Sol. Transaminase – transamination

Q15. How many electrons and protons are required for reduction of one molecule of nitrogen?

Sol. 8e– & 8H+

Q16. The first stable product of biological nitrogen fixation by Rhizobium in root nodules of legumes is

Sol. NH3

Q17. Most common amides in plants are

Sol. Glutamine and asparagine

Q18. Rhizobium in root nodules

Sol. Rhizobium – facultative anaerobe

Q19. Ammonia is oxidised to nitrite by

Sol. Nitrifying bacteria

Q20. Element that has its role in activation of enzyme nitrogenase is

Sol. Mo

Q21. Deficiency symptoms of essential elements

(a) Vary from element to element

(b) Depend on mobility of elements also

(c) Disappear when the deficient mineral nutrient is provided to the plant

Sol. All (a) (b) and (c)

Q22. The deficiency symptoms of the immobile elements tend to appear first in the young tissues. Select that elements.

Sol. Ca is an immobile element.

PHOTOSYNTHESIS

Q1. "CO2" is required for photosynthesis". This conclusion can be drawn by performing
Sol. Moll's Half leaf experiment

Q2. First action spectrum of photosynthesis was described in
Sol. Cladophora : It is green alga.

Q3. Match the column and choose the correct option w.r.t. chloroplast.

Column-I	Column-II
a. Light reaction	(i) Enzymatic process
b. Dark reaction	(ii) Synthesis of NADPH and ATP
	(iii) RuBisCO

Sol. During dark reaction CO2 is fixed with the help of RuBisCO

Q4. Primary pigment of photosynthesis
Sol. Chlorophyll-a is primary pigment.

Q5. Maximum photosynthesis takes place in the ____ light of spectrum.
Sol. Blue and red

Q6. Identify A and B in the following diagram. 400 500 600 700 Wavelength of light in nanometres (nm)
A B
Sol. A – Action spectrum of photosynthesis B – Absorption spectrum of chlorophyll-a

Q7. The first step of Z-scheme is
Sol. Excitation of electrons from chlorophyll

Q8. Where is the physical location of water splitting complex?
Sol. Towards the lumen side of thylakoid membrane; with PS-II

Q9. In ETS the movement of electron is downhill in terms of redox potential scale i.e.
Sol. Low to high redox potential scale.

Q10. Which of the following is not a function of accessory pigment?
Sol. Accessory pigments cannot initiate photosynthesis and hence cannot release electrons on absorption of light.

Q11. Cyclic photophosphorylation normally occurs in
Sol. Stroma lamellae

Q12. Z-scheme is
(I) Cyclic photophosphorylation
(II) Non-cyclic photophosphorylation
(III) Circulation of electron within the photosystem
Sol. (II)The pattern of non-cyclic photo phosphorylation looks like 'Z'. Hence called Z scheme.

Q13. Which of the following is not the requirement of chemiosmosis?

Sol. Differential concentration of protons is required for chemiosmosis. More protons are present in lumen than that of stroma.

Q14. The NADP reductase is

(I) Located on stroma side of thylakoid membrane

(II) Associated with non cyclic photophosphorylation

(III) Associated with PS-II The incorrect statement(s) are

Sol. NADP reductase is associated with photosystem I (PSl).

Q15. The first CO2 acceptor molecule in wheat and sugarcane has (i) and (ii) carbons. (respectively)

Sol. Wheat (C3 plant); it has RUBP, the primary CO2 acceptor whereas in sugarcane (C4 plant) has PEP as primary CO2 acceptor.

Q16. Site of photorespiration is

Sol. Peroxisomes; Glycolate is oxidised into glyoxylate

Q17. The first stable product of the biosynthetic pathway of photosynthesis is produced by

Sol. $CO2 + RUBP \longrightarrow PGA$.

Q18. The energetically costly but most efficient cycle of dark reaction in plants adapted to dry tropical regions is

Sol. Uses more energy (2 more ATP per CO2 molecule than C3 cycle) but fixes CO2 at its low concentration.

Q19. What is the site of RuBisCO for potato and Sorghum (respectively)?

Sol. Potato is a C3 plant and Sorghum is a C4 plant.

Q20. CO2 saturation point for C4 plants is

Sol. CO2 saturation point for C3 plants is 450 μl /L

Q21. The factor which produces its effect by affecting the plant rather than directly on photosynthesis is

Sol. H2O

Q22. The number of ATP consumed for fixation of one CO2 by maize and rice plants is respectively

Sol. Maize ⇒ C4 plant; Rice ⇒ C3 plant

Q23. The plant in which productivity will increase with CO2 concentration is

Sol. Tomato is a C3 plant which shows CO2 fertilisation effect.

Q24. Kranz anatomy is present in plants which shows
Sol. C4 plants show Kranz anatomy

Q25. Select incorrect statement w.r.t. LHC.
Sol. Pigment molecules are bound to proteins to form LHC.

Q26. **Statement-I –** PS II absorbs 680 nm wavelength of light.
Statement-II – PS I is located on non-appressed region of grana thylakoid. Choose the correct statement.
Sol. Statement-I and statement-II both are correct

Q27. In non-cyclic photophosphorylation the final electron acceptor is
Sol. NADP+

Q28. Which of the following represents uphill movement of electrons in Z-scheme?
Sol. Movement of electrons from excitation of chlorophyll.

Q29. Scotoactive stomata are associated with
Sol. Diurnal cycle - CAM Pathway

RESPIRATION

Q1. The breakdown of complex molecules in cytoplasm of a bacterial cell involves
Sol. The breaking of C–C bonds of complex compounds through oxidation within the cells

Q2. Which of the following enzymes in respiration does not require Mg^{2+} as a co-factor?
Sol. Lactic acid dehydrogenase has Zn^{2+} as a co-factor.

Q3. Which of the following enzymes of EMP pathway are involved in dehydration of phosphoglycerate and splitting of fructose-1,6-bisphosphate respectively?
Sol. Enolase and Aldolase

Q4. Which of the following is not associated with oxidative decarboxylation step in tricarboxylic acid cycle?
Sol. Refers to conversion of α-ketoglutaric and to succinyl CoA.

Q5. How many ATP molecules are formed through oxidative phosphorylation of one molecule of α-ketoglutaric acid entering the Krebs cycle?
Sol. 1 α-ketoglutaric acid generates 2NADH2 (6ATP) and 1FADH2 (2ATP). Total - 8 ATP 1 GTP is produced through substrate level phosphorylation.

Q6. Identify the correct option with respect to the following pathway 6C Aldose 3C Compound 6C 5C 4C C 2C Compound A B

Sol. B-link's reaction – takes place in mitochondrial matrix C – Krebs cycle A – Steps of glycolysis do not require oxygen.

Q7. Which of the following are mobile electron carriers present in the inner membrane of mitochondria?

Sol. Ubiquinone and cyt c

Q8. F1 part of complex V

Sol. Is peripheral membrane protein complex with ATP synthase activity

Q9. The volume of oxygen used is more than the volume of CO2 evolved for which of the respiratory substrate?

Sol. Tripalmitin : Fats (0.7)

Q10. Choose the incorrect statement w.r.t. Krebs cycle

Sol. Succinate dehydrogenase in found attached to the inner membrane of mitochondria.

Q11. Alcoholic fermentation differs from lactic acid fermentation in

Sol. In alcoholic fermentation CO2 is released.

Q12. The proteins enter respiratory pathway as __A__ after __B__

Sol. A - Pyruvate, B - Deamination

Q13. The irreversible step in glycolysis is catalysed by

Sol. Pyruvate kinase : All other enzymes given in the options catalyse steps which are reversible.

Q14. The key product of glycolysis is

Sol. 3C-keto acid is pyruvic acid.

Q15. Lactic acid B A Pyruvic acid
(i) X Y
(ii) Ethanol + (a) With respect to the above figure which of the following statements is correct?

Sol. Both the processes represent anaerobic pathway in which NADH2 acts as reducing agent.

Q16. Which of the following respiratory substrate has RQ less than one?

Sol. C6 H12O6 and C3 H6 O3 –(carbohydrates)– RQ = 1 C51 H98 O6 - fat (Tripalmitin) – RQ, less than 1, C4 H6 O5 –(organic acid)– RQ, more than one.

Q17. The final product of oxidative phosphorylation is

Sol. ATP + H2O

Q18. How many molecules of last electron acceptor in ETS are required if one molecule of isocitrate is a substrate during aerobic respiration?

Sol. Last electron accepter is oxygen. For each NADH2 and FADH2 one atom of oxygen is required. Hence for 3 NADH2 and 1 FADH2 formed from oxidation of one molecule of isocitrate, 4 oxygen atoms are required or 2 oxygen molecules.

Q19. The enzyme responsible for condensation of 2C compound with 4 C compound in TCA cycle is

Sol. OAA + Acetyl CoA → Citric acid

Q20. Breakdown of proton gradient across inner membrane of mitochondria is due to

Sol. Passive transport of protons through F0 part of complex V

Q21. UQ or Co-Q acts as a mobile carrier between

Sol. Complex I and complex III

Q22. Enzyme which acts as connecting link between Krebs cycle and ETS is

Sol. SDH links both the processes (Kerbs cycle and ETS).

Q23. Which of the following statements is not associated with the breakdown of respiratory substrates under anaerobic condition?

Sol. Link reaction is a part of aerobic respiration.

Q24. Fermentation differs from aerobic respiration in

Sol. Slow oxidation of NADH to NAD+

Q25. Which of the following intermediates of Krebs cycle is used in the synthesis of cytochrome?

Sol. Succinyl CoA

Q26. Which of the following steps of aerobic respiration is only decarboxylation?

Sol. Oxalosuccinic → α-Ketoglutaric

Q27. How many ATP molecules are obtained with involvement of ETS only if one molecule of PGAL is oxidised completely?

Sol. From one milecule of PGAL gain in glycolysis = 1NADH2 × 3 = 3 ATP Link reaction = 1 NADH2 × 3 = 3 ATP Kreb's cycle = 3NADH2 × 3 = 9 ATP 1FADH2 × 2 = 2 ATP Total = 17 ATP

Q28. Final electron donor in mitochondrial ETS

Sol. Final electron donor is cyt. a3 .

Q29. Yeast poison themselves to death when the concentration of alcohol reaches about

Sol. 13%

Q30. Which of the reaction takes place in the plasma membrane of bacterial cell?

Sol. Electron transport chain

PLANT GROWTH & DEVELOPMENT

Q1. Which of the following phytohormone is responsible for inducing horizontal growth of seedlings?
Sol. Ethylene

Q2. Environmental plasticity is shown by
Sol. Cotton, coriander and Larkspur show developmental heterophylly .

Q3. Match column I with column II and choose the correct option

Column I	**Column II**
a. Tomato	(i) Vivipary
b. Pfr	(ii) Bioassay of ethylene
c. Rhizophora	(iii) Physiologically active form
d. Triple response test	(iv) DNP

Sol. a(iv), b(iii), c(i), d(ii)

Q4. Chilling treatment prior to flowering
Sol. Winter varities require vernalisation. It is seen in many annuals and biennials but not in perennials.

Q5. The photoperiodic stimulus perceived by __(A)__ migrates to __(B)__ for producing flowers
Sol. A - Leaves, B - Shoot apex

Q6. A plant is subjected to alternating periods of 2 hrs light and 6 hrs dark, in a 24 hrs cycle for flowering what is the type of plant described above?
Sol. SDP(short day plants) require less photoperiod than critical period.

Q7. Match the columns w.r.t. precursor of PGRs

Column-I	**Column-II**
a. ABA	(i) Acetyl CoA
b. IAA	(ii) Methionine
c. GA	(iii) Tryptophan
d. Ethylene	(iv) Violaxanthin

Sol. a(iv), b(iii), c(i), d(ii)

Q8. Thinning of cotton is caused by
Sol. Thinning of fruits is caused by ethylene e.g. cotton, cherry, walnut etc.

Q9. A – Gibberellin promotes bolting in beet and cabbages just after flowering.
B – Kinetin does not occur naturally in plants.
Sol. GA promotes bolting just prior to the reproductive phase. Kinetin is synthetic product and does not occur naturally in plants.

Q10. Which of the following hormones is antagonistic to a PGR of terpene nature/composition in most of the cases?
Sol. Gibberellins are of terpene nature and show antagonistic effects to ABA.

Q11. Developmental phenotypic plasticity is seen in
Sol. Larkspur shows developmental plasticity whereas buttercup shows environmental plasticity.

Q12. Read the given statements and select the correct option.
(A) Nutrients are not required by plants for growth.
(B) Turgidity of cells helps in extension growth
(C) Environmental factors affect different stages of growth
Sol. Nutrients are required for the synthesis of protoplasm.

Q13. Which of the following is an example of redifferentiation
Sol. Secondary cortex formation

Q14. Tissue culture technique which involves formation of callus represents
Sol. Callus is mass of undifferentiated tissue.

Q15. The stimulus of vernalisation is perceived by
Sol. Stimulus for vernalisation is perceived by meristematic cells.

Q16. Ethephon is not involved in
Sol. Nutrient mobilisation is a function of cytokinin.

Q17. Which of the following functions is correct for a phytohormone whose discovery was based as a result of three independent researches?
Sol. Plays an important role in seed development, maturation and dormancy : This hormone is ABA.

Q18. Flowering No Flowering Above Below Critical photoperiod The above figure shows flowering in a particular type of plant. Choose the correct statement for this plant.
Sol. Henbane is an LDP (long day plant). It does not show flowering in photoperiod less than critical period.

Q19. Vernalisation
Sol. Stimulates a subsequent photoperiodic flowering response in biennials

Q20. Seed dormancy is regulated by
Sol. Seed dormacy is regulated by ABA.

Q21. Vernalisation can be replaced by
Sol. Gibberellin treatment

Q22. Development is controlled by
Sol. Environmental, genetic and intercellular factors

Q23. Phytohormone which plays a very important role in brewing industry also
Sol. Leads to early seed production in conifers . It is Gibberellins.