

XII STANDARD

**BIOLOGY - BOTANY**

1 Mark Question & Answers

**By**

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**TRICHY- 2**

Lesson - 1 Taxonomy of Angiosperms

One-mark questions.

1. Plant taxonomy is also known as Systematic Botany
2. The monumental work of Carl Linnaeus Species plantarum
3. Die Naturlichen Pflanzen Familien was the monograph of Adolf Engler Karl prantyl
4. According to Engler and Prantyl Asteraceae of Dicotyledons and Orchidaceae of monocotyledons were highly advanced
5. Bio Systematics may be defined as Taxonomy of living populations
6. The term biosystematics coined by Camp and Gily (1943)
7. Polynomial name of caryophyllum is Caryophyllum saxatilis folis gramineus unbellatus corymbis
8. Fifth International Botanical Congress held at Cambridge, England
9. International Code of Botanical Nomenclature was adapted from 1978
10. Binomials introduced by Gaspard Bauhin
11. Binomiales had properly made use by Carolous Linnaeus
12. If the generic and specific name are the same, it is called Tautonym
13. Example for tautonym is Sassafras Sassafras
14. 0.1% solution of Mercuric Chloride used as a fungicide in herbarium preparation
15. Naphthalene and CS<sub>2</sub> used as pesticide in herbarium preparation
16. More than 12,000 plant specimens are preserved in Rapinat Herbarium, Trichy.
17. Herbarium act as a data store
18. Benthem and Hooker described 97,205 species 202 families
19. Superior or inferior of half inferior ovary present in the series Calyciflorae
20. In Benthem and Hooker classification of plants the present orders were referred to by them as Cehorts
21. Podostemaceae is placed under the series Multiovulatae aquaticae
22. The series curve embrayae is placed under the subclass Monochlmydeae
23. Stellate hairs occur on the young parts of the plants of the family Malvaceae
24. The inflorescence type of Pavonia odorata is Terminal / Axillary cyme
25. Epicalyx is absent in Abutilon indicum plant of Malvaceae
26. The number of carpels seen in Althaea are Ten
27. The type of fruit seen in Abelmoschus is Loculicidal Capsule
28. Endospermous seeds with hairy covering seen in Gossipium barbadens
29. Deccan hemp is the common name of Hibiscus canabinas
30. The botanical name of Portia tree is Thespesia Populnea
31. The roots of Malva sylvestris and Althaea rosea used for treating whooping cough and dysentery respectively.
32. The binomital name of Holly hock is Althaea rosea

33. Twisted / Contorted type of aestivation seen in the petals of malvaceae
34. Solanaceae belongs to the order Polemoniales
35. Solanum giganteum is the tree of solanaceae.
36. Stem is modified into tuber in Solanum tuberosum
37. Mid rib and veins with yellowish spines seen in Solanum xanthocarpum
38. Fan shaped cyme is also known as Rhipidium
39. Ebracteate flowers are present in Solanum nigrum
40. Bell shaped and persistent calyx present in Solanum melongena
41. In Scizanthus pinnatus plant two stamens are fertile and three stamens are reduced to staminodes.
42. False septa seen in the ovary of Datura
43. The type of fruit seen in Petunia Capsule
44. Dome shaped stigma present in Datura plant
45. Atropine (from Atropa belladonna) is used for relieving muscular pain
46. Roots and leaves of Aswagandha (Withania somnifera) plant are used to treat nervous disorder
47. Leaves of Nicotiana tobaccum used as antispasmodic
48. The botanical name of night jasmine is Cestrum nocturnum
49. The binomial name of thoduvalai is Solanum trilobatum
50. The ovary is obliquely placed in the members of Solanaceae family
51. Water latex present in the stem of Jatropha curcus
52. Trifoliately compound leaves are present in Hevea brasiliensis
53. The stipules are modified into a pair of spines in Euphorbia splendens
54. The stipules are modified into glandular hairs in Jatropha curcus
55. The type of inflorescence seen in Acalypha is Catkin
56. Aphyllous flowers are seen in Euphorbia
57. Polyphyllous flowers are seen in Asphodelus / Phyllanthus niruri
58. Polyadelphous stamens are present in Ricinus communis plant
59. The tuberous roots of Manihot esculenta plant rich in starch
60. The seeds of Jatropha plant used to extract Biodiesel
61. The leaves and roots of Jatropha gossipifolia are used to treat Leprosy and Snakebite diseases
62. Crotan of gardens is the common name of Codiaeum Varigatum
63. The binomial name of Milk bush is Euphorbia tirucalli
64. The fruits of phyllanthus emblica rich in Vit-C
65. An example for cladode is Euphorbia tirucalli
66. Musaceae belongs to the series Epigynae
67. Distichous leaves are present in Ravenala
68. Abaca cloth obtained from Musa textiles
69. Antidote for cobrabite the sap obtained from the leaf bases of Musa
70. Musa is a Polygamous plant
71. Musa is a Gigantic herb
72. Spathe is a modified bract

## Lesson - 2 Plant Anatomy

### One-mark questions.

1. The change from meristematic to Permanent tissue is called Differentiation
2. Self-perpetuating cells are Meristems
3. In Meristems the cell wall is made up of Cellulose
4. Procambium gives rise to Primary Vascular Tissue
5. Cork cambium is also known as Phellogen
6. Parenchyma is the precursor of all the other tissues.
7. Star shaped parenchyma present in the petiole of Banana & Canna
8. Collenchyma is polygonal in cross section.
9. Uneven thickening confined to the corners of Collenchyma tissue.
10. The tangential walls of collenchyma thickened the hypodermis of Helianthes.
11. Angular collenchyma present in Datura, Nicotiana
12. Lacunate collenchyma present in Hypodermis of Ipomea
13. Brachy sclereids is also known as Stone cells
14. Macro sclereids found in the outer seed coat of Crotalaria
15. Seed coat of Pisum contains Osteo sclereids
16. Rod Cells, bone cells are the common name of Macrosclereids, Osteosclerids.
17. Fibres are also known as Supporting tissue.
18. Xylos means wood
19. Primary xylem is derived from Procambium
20. Secondary xylem is the derivative of Vascular Cambium
21. Tracheids are the water conducting elements of Pteridophytes, Gymnosperms
22. In tracheids, the conduction of water and mineral salts takes place through the Bordered pits
23. Simple perforation plate present in Mangifera
24. Multiple perforation plate present in Liriodenron
25. Vessels are the chief water conducting elements of Angiosperms
26. The vessels are occur in the Gnetum plant of Gymnosperms.
27. Xylem fibres are also known as Libriform fibres
28. The only living tissue in xylem is Xylem Parenchyma
29. The protoxylem is Short lived
30. Companion cells are absent in Pteridophytes, Gymnosperms
31. Protoxylem parenchyma present in Pteridophytes, Gymnosperms and Dicots
32. Protoxylem fibres are also known as Bast fibres.
33. Sacch scientist recognized three tissue systems in the plants.
34. Trichomes and root hairs are some epidermal outgrowths
35. The short cells present in the epidermis are called trichoblasts
36. The guard cells in the sugarcane surrounded by Subsidiary, Accessory cells
37. Conjoint vascular bundles present in Stem and leaves
38. Bicollateral vascular bundles seen in Cucurbitaceae
39. Amphicribal, concentric vascular bundles are present in Polypodium
40. Amphivasal, concentric vascular bundles are present in Acorus

41. The endodermis is made up of Barrel shaped parenchyma cells.
42. Lateral roots are Endogenous in origin
43. The Periderm is another protective tissue that supplants the epidermis in the roots and stems
44. Organs of absorption are the root hairs.
45. The plastid present in the cortex is Leucoplast
46. The cell wall material present in the radial and transverse walls of the endodermal cell is Suberin
47. The main function of Casparian strips is to prevent the reentry of water into the cortex
48. In Maize root the conjunctive tissue is made up of Scelerenchyma
49. Radial exarch and polyarch xylem is present in Monocot root
50. In bean root the conjunctive tissue is made up of Parenchyma
51. In bean root the metaxylem vessels are polygonal in shape
52. Root hairs originate from Trichoblasts
53. Pericycle is the outermost layer of stele
54. In Monocot stem hypodermis is up of Scelerenchyma
55. The ground tissue of Maize stem stores food and performs gaseous exchange
56. Conjoint, collateral, endarch and closed vascular bundles are present in Monocot stem / Maize stem
57. Phloem parenchyma, phloem fibres are absent in Monocot stem
58. The hypodermis of Dicot stem is made up of Collenchyma
59. Starch sheath of dicot stem is morphologically homologous to the endodermis found in the root.
60. The vascular bundles are arranged in a ring around the pith. This type of stele is called Eustele
61. Bundle cap is also known as hard bast
62. Conjoint, collateral, endarch and open vascular bundles are present in Dicot stem
63. Vascular bundles are skull shaped in Monocot stem
64. Dorsiventral leaves are present in Dicots
65. Isobilateral leaves are present in Monocots
66. Skeleton of the leaf Veins, Veinlets
67. Collateral, closed vascular bundles are present in Dicot leaf
68. Gateway of gaseous exchange are Stomata
69. Mesophyll means in the middle of leaf
70. The function of palisade parenchyma is Photosynthesis
71. Bundle sheath of Dicot leaf is made up of Parenchyma
72. The cuticle helps to check transpiration
73. Function of the pith is Storage of food
74. Wedge shaped vascular bundles are present in Dicot stem
75. The bundle sheath of monocot stem is made up of Scelerenchyma

### Lesson - 3. Cell Biology and Genetics

1. The term chromosome was introduced by Waldeyer
2. Bridges was the first to prove that the genes are carried on the chromosome
3. The identical chromatids are called Sister chromatids
4. Chromatin is formed by a series of repeating units called Nucleosomes
5. The terminal part of chromosome is called Telomere
6. The secondary constriction is associated with nucleolus organizer known as Chromosomal satellite
7. The metallic ions present in the eukaryotic chromosomes are Ca<sup>2+</sup>, Mg<sup>2+</sup>
8. L-shaped chromosome is otherwise called Sub-Metacentric
9. Supernumery chromosomes are found in Maize
10. Double minutes chromosomes are resistance against Drugs
11. Giant chromosomes are found in the Suspensors of embryo
12. Polytene chromosome were observed by C.G. Balbiani
13. The extremely large puff present in the polytene chromosome is Balbani ring
14. Lamp brush chromosomes occur at the Diplotene stage of meiotic prophase in oocytes of all animal species
15. The giant nucleus of the unicellular alga contain Lamp brush chromosomes
16. Lamp brush chromosomes first observed by Flemming
17. Chromosomes are the the physical carries of genes
18. The word gene was coined by W. Johannsen
19. When a gene undergoes changes due to mutation, it results in Biological variation
20. The relationship between genes and enzymes was discovered by Beedle, Tatum
21. One gene, one enzyme hypothesis proposed with the help of Neurospora
22. The totality of the DNA sequences of an organism is called as genome
23. The genome Ophioglossum is 631
24. Parental DNA this otherwise called Template DNA
25. Thale cress is the common name of Arabidopsis thaliana
26. The human genome comprises approximately  $3.2 \times 10^9$  nucleotides.
27. Sweet pea is the common name of Lathyrus odoratus
28. The ratio of coupling is 7 : 1 : 1 : 7
29. 1:7:7:1 is the ratio of Repulsion
30. Dihybrid test cross ratio is 1:1:1:1
31. Coupling and repulsion are the two aspects of Linkage
32. Crossing over between linked genes allows their recombination during Meiosis
33. Crossing over takes place in Pachytene stage of prophase I
34. Crossing over plays an important role in the process of evolution
35. The crossing over frequency helps in the construction of genetic maps
36. The unit of genetic map is Morgan or Centimorgan
37. Crossing between the linked genes results in Recombination
38. The total recombination between two genes is expressed as percentage recombination called Recombination frequency
39. The term mutation coined by Hugo-De-Vries

40. Charles Darwin called mutation as Sports
41. Bateson termed mutation as Discontinueous change
42. Bio chemical mutations reported in Neurospora
43. The type of mutation seen in sorghum is Lethal
44. Most of the mutations are harmful because they disturb the genic balance of the organism.
45. The mutant variety of Bengal gram is Cicer gigas
46. Deletion gene mutation reported in Bacteriophages
47. Substitution mutation is genetically important because it alter the phenotype of the organism.
48. The extensively mutation causing chemical is EMS
49. Tool for evolution is Mutation
50. Mutant variety of Paddy produce many tillers with long grains
51. Terminal deletion mutation reported in Drosophila Maize
52. Some duplication are useful in the evolution of the organisms.
53. During inversion mutation a chromosomal segment is reversed by an angle of 180°
54. Translocation mutation occurs between two non-homologous chromosomes
55. Translocation mutation is also known as Reciprocal translocation mutation.
55. Illegitimate crossing over play an important role in species differentiation.
57. Translocation causes Hereditary disorders
58. The haploid chromosomes in a species is called genome of the species.
59. Watermelon, grapes and banana are examples for Autotriploids
60. Grapes and Apples are examples for Autotetraploids.
61.  $2n-1$  means Monosomy
62.  $2n-2$  means Nullisomy
63. The first man made cereal is Triticale
64. Addition of one chromosome is called Trisomy
65. Addition of two chromosomes is called Tetrasomy
66. Trisomic condition reported in Datura stramonium
67. Polyploidy plays an important role in plant breeding and horticulture.
68. Tetraploidy cabbages and tomatoes contain more Ascorbic acid
69. Tetraploidy corn contain more Vit. A.
70. Both euploidy and aneuploidy in man causes congenital diseases.
71. The first direct evidence for DNA being the genetic material illustrated by Fredrick Griffith
72. The causing agent of pneumonia is Diplococcus pneumonia
73. If the hereditary material had been incorporated from an outside source then the process is called Transformation
74. DNA double helix model proposed by Watson & Crick
75. The coil of life is DNA
76. The width of DNA molecule is 20A°
77. The replication time of chromosome in E.coil is 40 minutes
78. The DNA is synthesized in small fragments called Okazaki fragments
79. The empirical rules regarding composition of bases in DNA is collectively known as Chargaff's law.

80. The mRNA is produced as a complementary copy of the DNA
81. There are about more than 20 types of tRNA's.
82. In bacterial cell, there are more than 70 tRNA's.
83. Transfer RNA is also known as a soluble RNA.
84. mRNA is about 3.5% percent of the RNA content of the cell.
85. RNA is universally present in all organisms except in DNA Virus.
86. mRNA carries the genetic information from DNA to Ribosomes
87. The cloverleaf model of tRNA proposed by R.W.Holley - (1969)
88. The tRNA molecules are made up of 73-93 ribnucleotides.
89. Relatively rRNA constitute about 80 percent of the total RNA of the cells.
90. DNA is more stable and resistant to enzymatic action.
91. tRNA amounts to about 15 percent of the total RNA of the cell.
92. Messelson and stahl's experiment material is E. Coli
93. The chemicals involved in DNA elongation are DNA polymerase I, II, III
94. Okazaki fragments are linked by the enzyme called Ligase
95. DNA's two strands unwinds/separated by Helicase enzyme.
96. DNA super coils are released by Topoisomerase enzyme.
97. The internucleotide sequence in DNA is 3.4A°
98. DNA controls all the biochemical activities of the cell.
99. Photographs of DNA first taken by Wilkins and Franklin
100. Polyploidy plays significant role in the evolution of new species.

#### LESSON: 4 BIO TECHNOLOGY

Time : 60 mts  
Marks: 75

##### One - Mark Questions:

1. The most powerful tools known to science in the genetic manipulation is E. coli
2. Genetically modified DNA fragments are termed Recombinant DNA
3. Restriction endonucleases. can cut DNA at specific places from chromosomes of nucleus.
4. DNA ligase is the enzyme that is used to join two DNA fragments together.
5. Genetically identical organisms that descend from a common ancestor are called clones.
6. A soil inhabiting bacterium is Agrobacterium tumifaciens
7. Crown gall disease in Tomato, Sunflower, Brinjal and Cotton caused by Agrobacterium tumifaciens
8. The Ti plasmid carried by the pathogenic bacterium causes tumours.
9. The restriction enzyme ECOR.I produced by the intestinal bacterium recognizes the sequences.
10. The cell wall of the bacterium is made permeable to the entry of altered plasmids by the action of Cellulase
11. Interferon helps the cells to resist viruses
12. Rennin inhibitors decrease Blood pressure.



13. Interleukin stimulates the proliferation of WBC that take part in Immunity.
14. Restriction enzymes are synthesized by Bacteria
15. Each restriction enzyme cleaves a molecule only at nucleotide sequence
16. The vector used in genetic engineering the carry genes into bacteria plasmid
17. The enzyme that catalyzes the splicing of two strands of DNA is Ligase.
18. In genetically engineered plant cells, a bacterium Agrobacterium is mainly involved in transfer of foreign gene.
19. Novel methods of ensuring DNA uptake into cells include gene gun, and Biolistics, Mechanical delivery, Electroporation
20. More than 50 types of transgenic plants have been successfully developed
21. Biodegradable plastic is polyhydroxy butyrate
22. Mouse-eared cress has been engineered to produce a Biodegradable plastic.
23. Under normal circumstance herbicide affect photosynthesis & Biosynthesis of essential amino acids.
24. A gene from Streptomyces hygroscopicus capable of inactivating the herbicide Basta.
25. Insecticidal activity depends on a toxic protein called Delta endotoxins
26. The toxin gene Bt<sub>1</sub> from Bacillus thuringiensis has been isolated and used for Agro bacterium
27. Manducta sexta is a pest of Tobacco
28. Plants are made to produce large amount of Sec. metabolites having high commercial value.
29. In tomato the enzyme Polygalacturonase breaks down cell wall constituents.
30. Antisense RNA is a RNA molecule capable of controlling the expression of particular enzymes.
31. Anand Mohan Chakrabarty developed a strain of Pseudomonas putida
32. The new strain of Pseudomonas putida is also known as superbug
33. A toxic protein called delta endotoxin is produced by Bacillus thuringiensis
34. Pseudomonas putida is an engineered bacterium that cans digest Crude oil slick
35. Transgenic plants with Nif genes that are capable of N<sub>2</sub> fixation.
36. Tumour inducing bacterium is called Agrobacterium tuncifaciens.
37. Protection of plants against pests through living organisms or their metabolite is called Biopesticides / Bio remediation
38. G. Haberlandt first successfully cusbtered iindividual plant cells.
39. Foundation of plant tissue cusbture was laid down by three scientist Gauthret, white and Nobecourt
40. Revision of mature tissue into meristems is known as Defifferentiation
41. In India research in tissue culture was insitated by Prof. Maheswari & Prof. S. Narayanaswamy
42. Th Ph of tissue culture medium is 5.8
43. Sterilization is the technique employed to get rid of the microbes.
44. The culture medium can be sterilized by keeping it in an autoclave and maintaining the temperature of 121° C for 15 minutes.
45. The culture medium with the inoculum is incubated at 26 + 2° C with the light intensity at 2000 to 4000 lux.

46. Unorganized mass of undifferentiated tissue is called as callus.
47. Formation of new organs from the callus under the influence of Auxin, cytokinin
48. The development of shoot from the callus is called Caulogenesis
49. The development of root from the callus is called rhizogenesis
50. Central Institute of Medicinal and Aromatic plants is located at Lucknow
51. Virus free germ plasm of banana produced through Apicalmeristem culture
52. Artificial synthetic seeds are produced through Somatic embryogenesis
53. Tissue culture helps in induction of haploidy in anther culture
54. The function of cytokinin is to increase celldivision
55. New organs are produced from the callus under the influence of a Hormone (Auxin, cytokinin)
56. For carrying out plan tissue culture work under aseptic conditions, a specific chamber employed is Laminar air flow chamber.
57. Pomato plant produced through Protoplasmic fusion
58. In mechanical method the cells are kept in a suitable plasmolyticum.
59. In protoplasmic fusion leaves are sterilized with 70% alcohol and then treating them with 2% solution of Sodium hypochlorite
60. Polyethylene Glycol act as a fusogenic agent
61. Somatic hybrids between rice and carrot were produced only through Protoplasmic fusion
62. The term single cell protein coined in the year 1956
63. Baker's yeast containing Mycoproteins which is used in the SCP Production.
64. Spirulina tablets are prescribed enriched vitamin for most people.
65. SCP Provides valuable protein-rich supplement in human diet.
66. SCP lowers blood sugar level of diabetics due to the present of Gamma lino lenicacid
67. Amongst bacteria Pseudomonas, Alkaligenes is regarded as one of SCP
68. Large Scale productions of SCP are made through huge vessels called Fermentor (or) Bioreactor
69. Domestic sewage is not suitable for large scale SCP production
70. The isolated protein/ The total cell material is called the SCP
71. Protoplasmic fusion greatly compensates for Interspecific hybridisation
72. The first step in somatic hybridization is the Isolation of protoplast
73. Gene gun is used to deliver DNA particles.
74. The department to Biotechnology, Govt. of India is located at New Delhi
75. Bipolar structure having shoot and root is called as Embryo

## Lesson - 5 Plant Physiology - I

### One Mark Questions

1. Photosynthesis literally Synthesis with the help of light
2. Watburg introduced the unicellular alga Chlorella as a suitable material to study photosynthesis.
3. Hill demonstrated photolysis of water
4.  $C_4$  pathway first reported by Hatch and slack.
5. The existence of light and dark reactions demonstrated by Emerson and Arnold
6. Photosynthesis is a source of all our food and fuel.
7. Chloroplasts are the actual sites of or photosynthesis
8. Leaves are the important organs of photosynthesis.
9. A typical chloroplast of higher plants is Discoid in shape.
10. The photosynthesis pigments are found concentrated in Granal lamella
11. Magnesium is an essential component of chlorophyll.
12. Chlorophyll -a is regarded as primary pigment
13. About 250 - 400 pigment molecules are present in a photosystem
14. The photosynthetic pigments are aggregated to perform photosynthetic activities is called Active centre (granal lamella)
15. The light driven reactions of photosynthesis are referred to as Electron transport chain
16. The process of ATP formation from ADP in the presence of light in chloroplast is called photophosphorylation
17. The light dependent splitting of water molecules is called Photolysis of water
18. Mn, Ca and Cl ions play prominent role in the photolysis of water
19. Non-cyclic electron transport is also known as Z- Scheme
20. Number of ATP formed during cyclic photophosphorylation is 2
21. Dark reactions discovered by Melvin calvin
22. RUBP is a Five carbon compound
23. The enzyme involved in the first step of Dark reaction is RUBP carboxylase
24. PGA is a 3 carbon compound
25. Dark reaction start and ends in RUBP
26. For every carbon fixation 3 ATP and 2 NADPH<sub>2</sub> are consumed
27. Example for  $C_4$  plant is Sugarcane
28. Rice is an example for  $C_3$  plant
29. Oxaloacetic acid, Malate, aspartate are four carbon compounds
30. In  $C_3$  plants photosynthesis occurs only in Mesophyll cells.
31. In  $C_4$  plants photosynthesis occurs in Mesophyll, Bundle sheath cells
32. Dimorphic chloroplast present in  $C_4$  plants
33. Bundle sheath chloroplast is also known as Agranal chloroplast
34. Hatch and slack pathway involves two Carboxylation reactions
35. Phosphoenol pyruvic acid is converted into oxaloacetic acid by the action of the enzyme Phosphoenol pyruvate carboxylase
36. Oxaloacetic acid is converted into aspartic acid by the enzyme Transaminase

37. Oxalo acetic acid may be reduced to malic acid by NADP<sup>+</sup> Specific malate dehydrogenase
38. In C<sub>4</sub> pathway the first stable product is OAA
39. Photorespiration is also known as C<sub>2</sub> cycle
40. Photorespiration involves Chloroplasts, Peroxisome, and Mitochondria cell organelles.
41. Photorespiration protects the plants from Photooxidative damage.
42. Dark respiration takes place in Mitochondria
43. Law of limiting factor proposed by Blackmann
44. Light between wavelengths of 400 to 700nm is most effective for photosynthesis
45. The higher intensity of light destruction of Chlorophyll occurs
46. The current level of CO<sub>2</sub> in the atmosphere is 0.0361/ 360ppm
47. Nitrogen is the basic constituent of chlorophyll.
48. If leaf undergoes, senescence loss of Chlorophyll occurs
49. Hydrilla plant is used in test tube, funnel experiment
50. Ganong's light screen Experiment demonstrates that light is essential for photosynthesis

### Lesson - 5 Plant physiology - II

#### One mark Questions

1. The special type of tissue present in vanda is Velamen
2. Certain Angiosperms like Monotropa have chlorophyll and have mycorrhizal roots.
3. The special root present in parasites is Hauastoria.
4. Cuscuta is an example for Total parasite
5. Example for partial parasite is Viscum
6. Drosera is also known as Sundew plant
7. The leaves of Drosera have numerous hair like appendages called Tentacles
8. Example currency of the cell or carries of free energy is ATP
11. ATP is a Nucleotide
12. Glycolysis occurs in Cytoplasm
13. Glycolysis is also known as EMP Pathway
14. The molecular formula of pyruvic acid is C<sub>3</sub> H<sub>4</sub> O<sub>3</sub>
15. Glycerdehyde 3 phosphate and DHAP are 3 carbon compounds.
16. Net gain of glycolysis is 2ATP, 2NADH<sub>2</sub>
17. Pyruvic dehydrogenase enzyme is involved in the oxidative decarboxylation of pyruvic acid.
18. Under anaerobic conditions pyruvic acid is reduced to Ethanal or lactic acid.
19. Oxidative decarboxylation of pyruvic acid occurs only under aerobic conditions
20. Sir Hans Krebs described the catalytic role of pyruvic acid for the production of energy in the cell.
21. During kreb's cycle very 2 molecules of acetyl CoA enter into kreb's cycle 24 ATP molecules are generated.
22. Kreb's cycle is also known as citric acid or TCA cycle.
23. Primarily Kreb's cycle is a energy producing system

24. Kreb's cycle is also known as Amphibolic process.
25. The electron transport components are arranged in the Inner membrane of mitochondria.
26. The synthesis of ATP from ADP in the presence of ATP synthetase.
27. The terminal constituent of the electron transport system is Molecular Oxygen
28. The power house of the cell is Mitochondria
29. Complete oxidation of one glucose molecule yields a net gain of 38 ATP
30. Pentose phosphate pathway discovered by Dickens - 1938
31. Pentose phosphate pathway take place in the cytoplasm
32. Pentose phosphate pathway is also known as hexose monophosphate (or) Direct Oxidation pathway.
33. The phases of pentose phosphate pathways are Oxidative, non-oxidative
34. During pentose phosphate pathway oxidation of one molecule of glucose produces 6 molecules of CO<sub>2</sub>, and twelve molecules of NADPH,
35. Alternative route for carbohydrate break down is Pentose phosphate pathway.
36. Pentose phosphate pathway provides Ribo sugar for the synthesis of nucleic acids.
37. Pentose phosphate pathway provides erythrose phosphate required for the synthesis of aromatic compounds.
38. Life in the absence of oxygen is called anaerobiosis.
39. Anaerobic respiration occurs in Yeast and some bacteria
40. Fermentation is an good example for anaerobic respiration
41. Respiratory quotient of a carbohydrate is one
42. Respiratory quotient of an organic acid is 1.33 (more than one) (Malic acid)
43. Respiratory quotient of fatty acid (Palmitic acid) is 0.36
44. Respiratory quotient for anaerobic respiration is Infinity
45. The compensation point is usually much more in C<sub>3</sub>, C<sub>4</sub> plants than the plants.
46. Fermentation literally means a chemical change accompanied by Effervescence
47. Ethanolic fermentation carried out by Yeast
48. Lactic acid fermentation carried out by Bacillus acidilacti
49. Zymase enzyme converts glucose into alcohol and Co<sub>2</sub>
50. Common respiratory substrates are carbohydrates.
51. In the Ganong's respiroscope experiment KOH absorbs CO<sub>2</sub>,
52. The ratio between the volume of CO<sub>2</sub> given out and the oxygen consumed during respiration is Respiratory Quotient
53. Growth in plants always accompanied by Differentiation
54. Meristems and cambium responsible for growth in plants.
55. New cells are continuously formed by the Apical meristems
56. In annual plants steady state phase is followed by Senescence
57. Growth in plants measured by Lever auxanometer
58. Auxins were isolated initially from human urine
59. IAA, phenyl acetic acid are Natural auxins.
60. Example for synthetic auxin or plant growth regulators are NAA.
61. Apical dominance caused by Auxin
62. Auxin at extremely low concentrations promotes growth of root

63. Abscission is prevented by Auxin
64. 2,4-D used to eradicate weeds in the field
65. Gibberellins first discovered by Kurusowa
66. The internodal elongation in rice plants known as Bakanae or foolish seedling disease.
67. The phytohormone occur in all group of plants is Gibberellins
68. Reversal of dwarfism in many genetically dwarf plant caused by Gibberellins
69. The sudden elongation of stem followed by flowering is called Bolting
70. Gibberellins breaks dormancy in Potato tubers
71. Cytokinins are first isolated by Miller and Skoog
72. The endosperm of coconut contain cytokinin hormone
73. Application of cytokinin delays the process of ageing in plants. It is also known as Richmond Lang effect
74. Ethylene is a gaseous hormone.
75. Positive geotropic bending of roots caused by Ethylene
76. Ethylene stimulates the formation of Abscission Zone in leaves.
77. ABA is a powerful growth inhibitor.
78. Abscisic acid causes closure of stomata
79. ABA stimulates positive geotropism in roots.
80. Ethylene is a potent inhibitor of Bud growth
81. ABA inhibits lateral bud growth in Tomato.

#### Lesson : 6. BIOLOGY IN HUMAN WELFARE - 1

##### One mark questions:

1. The dramatic increase in population otherwise called Population explosion
2. The quantity and quality of crops can be improved by modern scientific methods through Gene manipulation or Genetic engineering
3. ICAR means Indian Council of Agricultural Research
4. A single species is a group of assemblage of innumerable number of genetic types such as lines, strains etc.,
5. The successful strains of *Oryza sativa* are Co-15, ADT-16 AND TMV -2
6. Improvement in the genetic make up of plants is called plant breeding
7. Release of a variety of plant done after their extensive cultivation
8. The first and foremost aim in plant breeding is to create useful variation in the crop plant
9. Iron rich rice and carotene rich rice is also known as fortified rice
10. Scientists are protecting the important valuable crops by establishing gene/germ plasm banks.
11. One of the oldest procedure of plant breeding is selection
12. Selection methods are of two types name Mass and Pure line selection
13. The only disadvantage of mass selection is that it is difficult to distinguish hereditary variation from environmental variation
14. A pure line is a collection of plants obtained as result of repeated self pollination from a single homozygous individual.

15. Genetic variability is essential for adaptations in different environment and seasonal conditions.
16. Mung No.-1 variety is now being cultivated in Punjab.
17. A mung Phaseolus aureus variety was introduced from China.
18. Hybrids are the products of first generation obtained by crossing genetically unrelated parents.
19. Self-pollination results in the increase of homozygosity
20. Homozygous recessive alleles develop loss of vigour in plants.
21. A hybrid produced from fusion of protoplast of two different species is called Somatic hybridization
22. Cell wall removing enzymes are cellulase, pectinase
23. The superiority of the  $F_1$  hybrid in performance over its parents is called Heterosis or Hybrid vigour.
24. Vegetative propagation is the best suited measure for maintaining hybrid vigour.
25. The source for plant breeding is variation in plants.
26. When chromosome number is doubled by itself in the same plant it is called Autopolyploids.
27. Seedless tomato, apple, watermelons are Auto triploids/ Auto polyploids
28. Polyploidy can be induced by the use of colchicine to double the chromosome number.
29. Allotetraploids are produced by multiplication of chromosome sets that are initially derived from two different species.
30. Variations, that are brought forth through plant tissue culture are called Somoclonal variation
31. Disease resistant potato and rust resistant wheat are the examples for Somoclonal variation
32. Variety of short duration sugarcanes reproduced by Polyploidy breeding
33. Radiation induces Mutation to develop new variety of crops.
34. Triple gene wheat with increase in yield and height.
35. The paddy with saline tolerance and pest resistance is Atomita 2 - Rice
36. Repeated back crosses are attempted with the parent crop with more desirable characters and such a crop is known as Recurrent parent.
37. Vectors means Vehicular traffic
38. Genetic engineering is a tool used in modern crop improvement programs.
39. The term Bio fertilizer denotes all the nutrient inputs of biological origin for plant growth.
40. Bacteria and cyano bacteria are known to fix Atmospheric nitrogen.
41. Pseudomonas striata are used as seed inoculants as bio fertilizers coats for cereals.
42. Leguminous plants accumulate more than 80 kg of Nitrogen per hectare.
43. Azolla is a aquatic fern used as a bio fertilizer in rice field.
44. The fern widely employed as a successful bio fertilizer in Indian rice field is Azolla pinnata.
45. VAM is an example for Endophytic Mycorrhiza

- Example for ectotrophic mycorrhiza is Basidiomycetes fungi
- VAM is an example for Endotrophic mycorrhiza.
- Application of bio fertilizers increases yield up to 45 percent.
- Azolla, the bio fertilizer amends the soil with orgnic matter.
- Cyanobacteria secretes growth promoting hormones IAA, IBA, AND NAA
- Cyanobacteria are potent Neutralizer.
- The process of converting untenable, fallow land to cultivable soil is termed as soil reclamation
- Blue green algae play a vital role in soil reclamation
- Azotobacter and Azospirillum secrete antibiotics which act as Biopesticide
- Ectotrophic mycorrhiza, increases the surface area of root of host plants.
- Disease control measures may be divided into two main groups namely prophylaxis and disease resistance.
- Protection of the host from exposure to the pathogen, from infections is defined as prophylaxis.
- Blast disease of rice caused by the fungus Pyricularia oryzae
- Pyricularia oryzae belongs to the class Deuteromycetes
- Necrotic lesions on the leaf lamina and the leaf sheaths is the symptom of Blast disease of Rice.
- Example for seed protectants are Agrosan GN, Cerasan and Spargon
- Collateral host plant of Rice is Digitaria marginata
- Blast disease can be controlled effectively by spraying Bordeux mixture
- The dusting of organo mercuric compounds has been suggested for controlling blast.
- Tikka disease of ground nut caused by a fungus. Cercospora Personata
- Ground nut or pea nut is the common name of Arachis hypogea
- Tikka disease of ground nut controlled by Sanitation, and Croprotation
- Xanthomonas citri is the causing agent of Citrus canker
- Xanthomonas citri belongs to the class Schizomycetes
- The most commonly prevalent disease during the rains is citms cankar
- The spraying of the antibiotic streptocycline prevents citrus cankar
- Tungro disease of rice caused by Rice tungro virus
- Rice tungro virus is stransmitted by a Leaf hopper
- Serin carbonyl is a powerful pesticide that can kill more than 1000 types of Insects.
- The chemical responsible for Bhopal tragedy is Methyl Iso cyanate MIC
- The most frequently used bio-control agents are Chrysanthimum, Bacillus thuringiensis
- Pyrethrum extracted from Chysay thimum belonging to Asteraceae
- B. thuringiensis is harmful to Lepidoptera insects
- Vitamin A deficiency leads to Blindness.
- Potrykus of Switzerland and Peter Bayer of Germany transferred genes that make carotene is daffodils into Oryza sativa
- Tomatoes with elevated sucrose and reduced starch produced by using sucrose phosphate synthase gene.



82. Starch content in potatoes increased by ADP GPP ase gene
83. E.coli and Vibrio cholerae that colonize that small intestine and produce Enterotoxin
84. Transgenic plants are looked upon as a source of Antibodies.
85. Transgenic plants also provide passive Immunization by direct application.
86. Interferon's are Antiviral in nature.
87. Scientist have successfully produced transgenic Tobacco and Maize plants that secrete human interferons (IFN - r)]
88. A single gram of the most virulent strains of weaponized small pox or anthrax could contain 250 million infectious doses.
89. During world war II, paper bags filled with Plaque infested fleas were employed as biological weapons.
90. Using molecular biology techniques, new combinations of genes were attempted to create Genetically modified plants (GMO's)
91. Biological warfare releases dangerous microorganisms affects the Balance of Nature.
92. Pentadiplandra brazzeana, a native plant of West Africa produces a protein called Brazzein
93. Pentadiplantara brazzeana used as a low-caloric sweetener.
94. Treatment of trade related bio-technological processes and products, popularly described as Intellectual property
95. PBR means Plant Breeders Right
97. The major negative aspects of Bio patency is Scarcity of genetic resources
98. Oil eating bacterium is Pseudomonas putida.
98. Indian patent Act followed from the year 1970
99. Man cultivate only Fifteen species of plants as food crops
100. A substitute for tea is the leaves of Hex Paraguriens is
101. Powdered seeds of Cola nitida is used as a substitute for Coffee
102. Winged bean has high Protein and oil
103. Man made complex substances are known as Xenobiotics
104. 50 varieties of rice and 20 varieties of wheat have been developed in China
105. The herbal drug Ginseng is obtained from Panax ginseng
106. The drug emetine is obtained from Cephalis
107. Medicinal properties of plants have been mentioned even in the oldest Rig veda
108. It is estimated that around 70,000 plant species, have been used as medicinal plants
109. In India, for nearly 1,100 plant species used in different systems of medicines.
110. Medicinally valuble compound obtained from the medicinal plants are called Bio. medicines
111. Morphine, the strongest pain killed obtained from Papaver somniferum
112. Quinine is a Antimalarial drug
113. Quinine derived from Cinchona calisaya, C. officinalis plants
114. Digoxin used to treat cough
115. Digoxin in obtained from the plant Digitalis
116. Ephedrine used to treat cough.
117. Mental and physical stress relaxing drug is obtained from the plant Panax ginseng
118. Kuppaimeni or poonamayakki is the common name of Acalypha indica

119. The medicinal compounds obtained from *Acalypha indica* are Acalyphine, Triacetoneamine
120. Acalyphine and Triacetoneamine contain Cyanogenic glucoside and Alkaloids
121. The common name of *Aegle mormelous* is Vilvum
122. *Aegle mormelos* belongs to the family Rutaceae
123. The unripe fruits of vilvum used to treat problems of Stomach indigestion
124. Aegle mormelos used as a tonic for the betterment of heart and brain.
125. The trade name of the *Aegle mormelos* is Baer fruit

### Lesson : 6 BIOLOGY IN HUMAN WELFARE - II

#### One mark Questions :

1. The chemicals present in *Aegle mormelos* are Marmelosin, Coumarin and triterpenoids
2. *Cissus* belongs to the family Vitaceae
3. Pirandai is the common name Cissus quadrangularis
4. Hadjor or bone joiner is the trade name of Cissus
5. The active chemicals present in *cissus* are Presence of tetracyclic triterpenoids
6. The whole plant of *Cissus* is useful to treat Asthma and Stomach troubles
7. The common name of *Mimosa pudica* is Thottai Sdrungi
8. The alkaloids obtained from *M. pudica* is Mimosine
9. Whooping cough cured with the help of Mimosa pudica
10. The common name of *solanum nigrum* is Mannatha thakkali
11. Black night shade is the trade name of Solanum nigrum
12. Cirrhosis of Liver treated with the help of S. nigrum plant
13. Active medicinal compounds extracted from *S.nigrum* are Solanin, Saponin
14. Penicillin is obtained from the blue green mold Penicillin notatum
15. Penicillin is effective against gram positive bacteria like Pneumonia
16. Streptomycin obtained from Streptomyces grieseus an actinomycetes.
17. Streptomycin cures urinary infections, tuberculosis meningitis and pneumonia.
18. Aureomycin is obtained from Streptomyces aurefaciens
19. Chloromycetin is obtained from Streptomyces venezulae
20. Chloromycetin cures Typhoid fever
21. Aureomycin used as a medicine in the osteomyelitis, whooping cough and eye infections
22. Aspergillus fumigatus antibiotic is used against Typhoid and Dysentery
23. Bacitracin is an antibiotic obtained from Bacillus licheniformis used to treat syphilis.
24. *Bacillus subtilis* produces 60 different antibiotics
25. *E.coli* is articulated to produce human insulin called humulin
26. Rice belongs to the family Poaceae
27. Rice plant is an Annual grass

23. Rice is the chief source is Carbohydrates
29. Sake is an important alcoholic beverage in Japan
30. Bran - wax is used in Chocklate industry and in the manufacture of Lip - Sticks
31. Paddy husk is used as Fuel
32. Ground nut belongs to the family Fabaceae
33. Ground nut is rich in Fatty acids and Proteins
34. Ground nut kernel is rich and chief source of vegetable protein
35. Ground nut shell is used in the manufacture of activated Carbon
36. Many members of Malvaceae family yield cotton
37. Egyptian cotton is the common name of Gossypium barbadense
38. Cotton sees cade is used as a Organic manure.
39. Fatty acids obtained from cotton seed cake oil is used in the preparation of Insecticide and fungicide
40. The binomial name of teak is Tectona grandis
41. Teak belongs to the family Verbinaceae
42. Teak wood shows resistance to Termites
43. Teak wood is used in ship building
44. Acalypha indica belongs to Euphorbiaceae family
45. In Cissus quadrangularis, coiled tendrils are found opposite to the leaves
46. Rice is the major food of half of the worl's population
47. Fruit is the back coloured berry in Solanum nigrum
48. In Mimosa pudica plant flowers are pink and found in axillary heads.
49. Axillary spike inflorescence present in Acalypha indica
50. Axillary panicle inflorescence present in Aegle mormelos

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**Botanical Name**  
**Malva** rotundifolia  
**Pavonia** odorata  
**Abelmoschus** esculentus  
**Sida** cardifolia  
**Gossypium** barbedense  
**G.hirsutum**  
**G. harbaceum**  
**Hibiscus** cannabinus  
**H. sabdarrifa**  
**H. cannabinus**  
**Thespesia** populnea  
**Abutilon** Indicum  
**Althae** rosea  
**Hibiscus** rosa - Sinensis  
**H. schizopetalous**  
**Solanum** torvum  
**S.xanthocarpum**  
**Datura** metal  
**Solanum** melongena  
**S. tuberosum**  
**Lycoperiscum** esulentum  
**Solanum** trilobatum  
**Withlia** somnifera  
**Nicotania** tobacum  
**Cestrum** diurnum  
**Cestrum** nocturnum  
**Petunia** hybrida  
**E. antiquorum**  
**Croton** sparsiflorus  
**Acalypha** indica

**Manihot** esculenta  
**Phyllanthus** emblica  
**R. communis**  
**Jatropha** curcus  
**Hevea** brasiliensis  
**Manihot** glaziovii  
**Codleaum** Variegatum  
**E. tirucalli**  
**Triticum** vulgare  
**Phaseolus** aureus  
**Oryza** sativa  
**Arachis** hypogea  
**Papaver** somniferum  
**Aegele** mormelos  
**Cissus** quadrangularis  
**Mimosa** pudica

Tectona grandis

**Common Name**  
 Thirikalamalli  
 Peramutti  
 Lady's Finger  
 Nilathuthi  
 Egyptian cotton  
 American cotton  
 Cotton  
 Deccan hemp  
 Pullichai  
 Pulichai keerai  
 Portia tree  
 Thuthi  
 Holly nock  
 Shoeflower, Chinese rose  
 Dissected petals  
 Sundaikaai  
 Manathakkali  
 Oomatnai  
 Brinjai  
 Potato  
 Tomato  
 Thooduvalai  
 Ammukkara, Ashwagantha  
 Tobacco  
 Day jasmine  
 Night jasmine  
 Pink flower  
 Sadhurakkalli  
 Eli amamakku  
 Kuppaimeni, Poonamayaki  
 Indian Acalypha  
 Tapioca  
 Gooseberry  
 Castor  
 Katta manku  
 Para rubber  
 Manicoba rubber  
 Crotonm of gardens  
 Milk bush  
 Wheat  
 Mung  
 Rice  
 Ground nut  
 Opium poppy  
 Vilvam, Baer fruit  
 Pirandai, Hadgjor / bone joiner  
 Thottal chinungi ( Surungi)  
 Touch me not plant  
 Teak

BIOLOGY - BOTANY

XII STD

YEARS, SCIENTIST AND IMPORTANCE

Serial No.	Year	Scientist Name	Importance
<u>Lesson -1</u>			
<u>Taxonomy of Angiosperms</u>			
01.	1753	Carolous Linnaeus	Species plantarum (24 classes, 7,300 species)
02.		George Benthem, Sir Joseph Dalton Hooker	Natural system of classification
03.		Adolf Englar, Karl Prantyl - Monograph	Die Naturlichen pflanzen Familian
04.	1943	Camp, Gily	Coined the term Bio systematics
05.	1623	Gaspard Bauhin	Introduced Binomial system
06.		Carolous Linnaeus	Properly used Binomiales
07.	1930	Cambridge, England (place)	Fifth IBC Fram rules and regulations for naming plants
08.	1975	Leningrad, USSR (place)	Twelfth IBC
09.	1978		Current system of ICBN adpoted
<u>Lesson -3</u>			
<u>Cell Bilogy</u>			
1.	1888	Waldeyer	Introduced the term chromosome
2.	1916	Bridges	proved that genes are carried on the chromosome
3.	1881	C.G. Balbian	First observed polytene chromosome in the salivary glands of Drosophila
4.	1882	Fleming	First observed Lamp brush chromosome in oocytes of animal species and Nucleus of unicelluar algae Acetabularia
5.	1909	W.Johannsen	(Diplotene - Meiosis - I) Coined the term gene
6.	1958	Beadle and Tatum	One gene one enzyme/one gene one polypepside hypothesis / relation ship between genes and enzymes / Nobel Prize.
7.	1906	William Bateson, Reginald punnet	Coupling, repulsion experiment in Sweet pea
8.	1901	Hugo Devries	Coined / used the term mutation
9.		Charles Darwin	Termed Sudden Change as Sports
10.		Bateson	Called mutation as a discontinuous change
11.	1928	Frederick Griffith	Hereditary role of DNA transformation in Diplococcus pnemoniae

Serial No.	Year	Scientist Name	Importance
12.	1953	James wastson, Francis Crick	Proposed double Helix DNA model
13.	1949	Erwin chargaff	First proved that the two nucleotide strands held together by unstable hydrogen bonds, chorgaff's rule
14.		Wastson and crick	Suggested the semi conservative method of replication of DNA
15.		Messelson and stahl's	Proved semi conservative replication of DNA in E. Coli
16.	1965	R.W. Holley	Suggested the clover leaf model of t RNA
<b><u>Lesson - 4 Bio - Technology</u></b>			
01.	1979	Anand Mohan Chakrabarty	Developed a strain of Pseudomonas putida (Bio remediation)
02.	1898	G. Haberlandt (German)	Successfully cultured individual plant cells
03.	1934- 1939	Gauthret, White, Nobecourt	Laid down foundation of plant Nobecourt tissue culture
04.	1966		The term single cell protein was coined.
05.		Maheswari, S.Narayanaswamy <b><u>Lesson - 5 Plant Physiology</u></b> <b><u>Page - 129 Table</u></b> <b><u>(History of Photosynthesis)</u></b>	Indian Embryologist
01.		Melvin calvin	Calvin cyle / Dark reaction
02.		Hatch and slack	C <sub>4</sub> path way
03.	1905	Blackman	Laws of limiting factor
04.		Emden, Meyerhof, Parnas (German)	First demonstrated Glycolysis in yeast cells
05.	1937	Sir Hans Adolf Kreb	Described catalytic role of pyruvic acid for the production of energy in the cell.
06.	1938	Dickens	Discovered pentose phosphate Hexose monophosphate/Direct oxidation path way
07.	1928	Went	Discovery of Auxin
08.		Kurusowa	First discovered Gibberellin
09.	1954	Miller and Skoog	Isolated Cytokinin from Herring fish
10.	1959	Butler et. al	Discovered a photo receptor flower inducing pigment phytochromes
11.	1920	T.D. Lysenko	Introduced the term vernalization
12.	1970	Indian patent Act Potrykus, Peter Bayer (Switzerland, Germany)	Transferred Carotene making genes from daffodils into Oryza sativa

Serial No.	Number	Importance
	<u>Lesson - 1</u>	
01.	24, Classes, 7,300 species 41cm x 29cm	Species plantarum Herbarium sheet size
02.	Page No.8 Tabular Column	-----
03.	97,205 plant species in 202 families	Genera plantarum (Bentham and Hooker)
04.	82 genera, 1500 speies	Malvaceae family
05.	22 genera, 125 species	Malvaceae (India)
06.	90 genera, 2800 speices	Solanaceae family
07.	21 genera, 70 species	Solanaceae family (India)
08.	300 genera, 7,500 species	Euphorbiaceae family
09.	70 Genera, 450 species	Euphorbiaceae family (India)
10.	6 genera, 150 species	Musaceae family
11.	2 genera, 25 species	Musaceae (India)
	<u>Lesson : 3</u>	
01.	H <sub>1</sub> , H <sub>2</sub> A, H <sub>2</sub> B, H <sub>3</sub> , H <sub>4</sub>	The four main histones
02.	Page - 78, Page - 79	Tabular Column
03.	1000 bp (bage pairs)	Kilo bages
04.	1 million base pairs	Megabases
05.	130 mega bases (130mb)	Seen in the crucifer weed Arabidopsis thaliana (thale cress) in five chromosomes (2n=10)
06.	3.2 x 10 <sup>9</sup> nucleotides	Human genome
07.	37 genes, 16,569 bage pairs	Human mitochondrial genome
08.	Page - 79 - Table	
09.	30,000 - 40,000 genes	Human genes - functions are known
10.	1: 1: 1:1	Dihybrid test cross ratio
11.	7:1:1:7	Coupling ratio
12.	1:7:7:1	Repulsion ratio
13.	6 : 44 : 44 : 6 Blue Blue Red Red long round long round	(Repulsion)
14.	44 6 6 44 Blue Blue Red Red long round long round	(coupling)

Serial No.	Year	Scientist Name	Importance
15.		28 (2n)	Chromosome number of Triticum durum
16.		14 (2n)	Chromosome number of Secale cereale
17.		21 (2n)	Chromosome Number of Triticale
18.		42 (4n) hexaploid Triticale (Book)	Number of Triticale
19.		0 20 A	The width of DNA molecule
20.		0 34 A	The DNA strand Completes a turn
21.		3.4 A	The inter nucleotide distance
22.		20 types	tRNA
23.		73-93 ribonucleotides	One tRNA have the above mentioned nucleotides.
24.		38.2%	Biochemical process
25.		23.2%	Maintainence of Genome
26.		21.1%	Receiving and Giving signals
27.		17.5%	General cellular functions
<b>Chapter IV</b>			
<b><u>Bio - Technology</u></b>			
01.		50	The number of genetically engineered plant species (transgenic plants)
02.		6	Transgenic dicotyledonous plants
03.		4	Monocotyledenous plants
04.		26 x 150 mm	The size of culture tubes
05.		5.8	The pH of culture medium
<b>Chapter V</b>			
<b><u>Plant Physiology</u></b>			
06.		40 - 60 grana	Each choloro plast have the above mentioned grana
07.		40 -100	Each granum have the above mentioned thylakoids
08.		250 - 400	The number of pigment molecules are present in a photo system.
09.		4-6 microns	The size of chloroplast



Serial No.	Year	Scientist Name	Importance
10.		Half million	The number of chloroplast are present in one square millimetre of a leaf
11.		5 carbon compound	RUBP
12.		3 Carbon compound	PGA, DHAP, G3P
13.		3 ATP, 2 NADPH <sub>2</sub>	Consumed for the fixation of one CO <sub>2</sub> during dark reaction
14.		2 Carbon compound	Phosphoglycolic Acid
15.		4 Carbon compound	Oxalo acetic acid
16.		3 Carbon	Pyruvic Acid
17.		Acetyl CoA	2 Carbon compound
18.		6 Carbon	Citric Acid Cis aconitic acid Iso citric acid
19.		5 Carbon	Alpha Keto glutoric acid
20.		4 Carbon	Succinyl CoA, Succinic Acid Fumaric Acid Malic Acid oxaloacetic Acid
21.		24 ATP	Formed during Kreb's cycle
22.		38 HTP	NUmber of ATP molecule formed from the oxidation of glucose
23.		3 C	Phosphoglyceral dehyde
24.		4 C	Erythrose phosphate
25.		5C	Xylose phosphate
26.		7C	Sedoheptulose phosphate
27.		90	Number of Gibberellins isolated from fungi
28.		660nm	The type of phytochrome absorbs 660nm blue green region
29.		730 nm	The type of phytochrome absorbs 730nm in green region

Serial No.	Year	Scientist Name	Importance
		<b><u>LESSON -6 BIOLOGY IN HUMAN WELFARE</u></b>	
30.		One billion	The world's human population (1850)
31.		6.1 Billion	Human population (2000)
32.		45%	Use of bio fertilizers
33.		6-7.5m	Height of A. mormelas
34.		75cm	Height of A. indica
35.		17 year	Patent by USA laws
36.		5 years	Duration of patent
37.		1g /45 L	Treatment Streptocycline
38.		3-4mm	Diameter of leision of Citrus canker
39.		1-6mm	Lesions height in Tikka disease
40.		0.2% of Kalimat B	Treatment of Blast disease
41.		30 Kg	Bio fertilizer store per hectare
42.		80 Kg	Leguminous plants store per hectare
43.		25%	Increase in yield of Maize
44.		Bordeaux mixture	CuSo <sub>4</sub> 9 Kg
45.			Cao 9 Kg
46.			Water 250 litre
47.		150 Kg	Nitrogen added by Rhizobium
48.		3-4 years	Biofertilisers remain in soil
49.		100 types of insects	Serin (Carbaryl) a powerful pesticide that can kill more than 100 types of Insects
50.		250 Million infectious doses	A single gram of the most virulent strains of weaponized small pox/Anthrax could contain 250 million infectious doses
51.		50	Varieties of rice developed in China
52.		20	Varieties of Wheat developed in China
53.		Million people	Die due to vitamin A deficiency

Serial No.	Year	Scientist Name	Importance
52.		3,50,000	Go blind due to Vit. A. deficiency
53.		70,000	Plants have been used as medicinal plants.
54.		1,100 species	Used in India
55.		600 - 700 Species	Used much in India
56.		15-20 Pair	Leaf lets are arranged in two rows (Mimosa pudica)
57.		60 types of antibiotics	from Bacillus subtilis
58.		100 times sweeter than sugar	Brazzien
59.		25%	Prescribed by WHO
<b>ABBREVIATIONS</b>			
<b>Lesson - 1</b>			
01.		ICBN	International Code of Botanical nomenclature
02.		IBC	International Botanical congress
<b>Lesson - 4</b>			
03.		Ti	Tumor inducing plasmid
04.		PHB	Poly hydroxy butyrate (Bio degradable plastic)
05.		MS medium	Murashige and Skoog medium
06.		B 5 Medium	Gamborg medium
07.		W medium	White medium
08.		Erylenmayer Flask	Conical flask
09.		DBT	Department of Biotechnology
10.		IARI	Biotechnology centre, New Delhi
11.		BARC	Baba Atomic Research Centre, Bombay
12.		CIMAP	Central Institute of Medical and Aromatic plants, Lucknow
13.		MSSRI	Dr. M.S. Swaminathan Research Institute, Chennai.
14.		SCP	Single Cell Protein
15.		Fermentor	Special Sterilized Vessel.

Serial No.	Year	Scientist Name	Importance
16.		PEG	Poly ethylene glycol
17.		PVC	Poly vinyl chloride
18.		PEP	Phosphoenol phynivic Acid
19.		OAA	Oxalo acetic Acid
20.		ETS	Electron transport chain
21.		IAA	Indole 3 Acetic Acid
22.		NAA	Naphthalene Acetic Acid
23.		PAA	Phenyl Acetic Acid
24.		ABA	Abscise Acid
25.		PR	Promotes Flowering
26.		Pfr	Suppresses Flowering
27.		ICAR	Indian council of Agricultural Research
28.		VHM	Vesicular Arbuscular Mycorrhiza
29.		MIC	Methyl Isocyanate
30.		GMF	Genetically modified food
31.		GMO	Genetically modified organisms
32.		ADP GPP ASE	ADP Glucose Pyro phosphorylase Gene
33.		IPP	Intellectual property protection
34.		IRP	Intellectual property Rights
35.		PBR	Plant Breeder's Right