Botany : Section-A (Q. No. 101 to 135)

101 Lecithin, a small molecular weight organic compound found in living tissues, is an example of:

(1) Amino acids
(2) Phospholipids
(3) Glycerides
(4) Carbohydrates

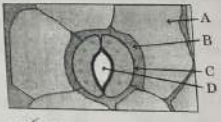
102 How many molecules of ATP and NADPH are required for every molecule of CO_2 fixed in the Calvin cycle?

(1) 2 molecules of ATP and 3 molecules of NADPH
(2) 2 molecules of ATP and 2 molecules of NADPH
(3) 3 molecules of ATP and 3 molecules of NADPH
(4) 3 molecules of ATP and 2 molecules of NADPH

103 Hind II always cuts DNA molecules at a particular point called recognition sequence and it consists of:

(1) 8 bp (2) 6 bp
(3) 4 bp (4) 10 bp

104 In the given figure, which component has thin outer walls and highly thickened inner walls?



(1) C (2) D
(3) A (4) B

105 The cofactor of the enzyme carboxypeptidase is

(1) Zinc (2) Niacin
(3) Flavin (4) Haem

106 The capacity to generate a whole plant from any cell of the plant is called:

(1) Totipotency
(2) Micropropagation
(3) Differentiation
(4) Somatic hybridization

[Contd...

107 Match List I with List II

List I	List II
A. *Rhizopus*	I. Mushroom
B. *Ustilago*	II. Smut fungus
C. *Puccinia*	III. Bread mould
D. *Agaricus*	IV. Rust fungus

Choose the correct answer from the options given below:

(1) A-III, B-II, C-IV, D-I
(2) A-I, B-III, C-II, D-IV
(3) A-III, B-II, C-I, D-IV
(4) A-IV, B-III, C-II, D-I

108 Given below are two statements:

Statement I : Bt toxins are insect group specific and coded by a gene cry1Ac.

Statement II : Bt toxin exists as inactive protoxin in *B. thuringiensis*. However, after ingestion by the insect the inactive protoxin gets converted into active form due to acidic pH of the insect gut.

In the light of the above statements, choose the correct answer from the options given below:

(1) Both Statement I and Statement II are true
(2) Both Statement I and Statement II are false
(3) Statement I is true but Statement II is false
(4) Statement I is false but Statement II is true

109 Which of the following is an example of actinomorphic flower?

(1) *Datura* (2) *Cassia*
(3) *Pisum* (4) *Sesbania*

110 The type of conservation in which the threatened species are taken out from their natural habitat and placed in special setting where they can be protected and given special care is called:

(1) *in-situ* conservation
(2) Biodiversity conservation
(3) Semi-conservative method
(4) Sustainable development

111 Identify the set of correct statements:

A. The flowers of *Vallisneria* are colourful and produce nectar.
B. The flowers of waterlily are not pollinated by water.
C. In most of water-pollinated species, the pollen grains are protected from wetting.
D. Pollen grains of some hydrophytes are long and ribbon like.
E. In some hydrophytes, the pollen grains are carried passively inside water.

Choose the correct answer from the options given below:

(1) C, D and E only
(2) A, B, C and D only
(3) A, C, D and E only
(4) B, C, D and E only

112 The lactose present in the growth medium of bacteria is transported to the cell by the action of:

(1) Beta-galactosidase
(2) Acetylase
(3) Permease
(4) Polymerase

113 Match List I with List II

List I	List II
A. *Clostridium butylicum*	I. Ethanol
B. *Saccharomyces cerevisiae*	II. Streptokinase
C. *Trichoderma polysporum*	III. Butyric acid
D. *Streptococcus* sp.	IV. Cyclosporin-A

Choose the correct answer from the options given below:

(1) A-III, B-I, C-II, D-IV
(2) A-II, B-IV, C-III, D-I
(3) A-III, B-I, C-IV, D-II
(4) A-IV, B-I, C-III, D-II

114 The equation of Verhulst-Pearl logistic growth is $\frac{dN}{dt} = rN\left[\frac{K-N}{K}\right]$.

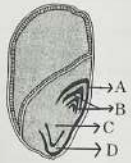
From this equation, K indicates:

(1) Intrinsic rate of natural increase
(2) Biotic potential
(3) Carrying capacity
(4) Population density

115 Auxin is used by gardeners to prepare weed-free lawns. But no damage is caused to grass as auxin

(1) promotes apical dominance.
(2) promotes abscission of mature leaves only.
(3) does not affect mature monocotyledonous plants.
(4) can help in cell division in grasses, to produce growth.

116 Identify the part of the seed from the given figure which is destined to form root when the seed germinates.



(1) A (2) B
(3) C (4) D

117 Given below are two statements:

Statement I : Parenchyma is living but collenchyma is dead tissue.

Statement II : Gymnosperms lack xylem vessels but presence of xylem vessels is the characteristic of angiosperms.

In the light of the above statements, choose the correct answer from the options given below:

(1) Both Statement I and Statement II are true
(2) Both Statement I and Statement II are false
(3) Statement I is true but Statement II is false
(4) Statement I is false but Statement II is true

118 These are regarded as major causes of biodiversity loss:

A. Over exploitation
B. Co-extinction
C. Mutation
D. Habitat loss and fragmentation
E. Migration

Choose the correct option:

(1) A, C and D only
(2) A, B, C and D only
(3) A, B and E only
(4) A, B and D only

119 Which one of the following is not a criterion for classification of fungi?

(1) Morphology of mycelium
(2) Mode of nutrition
(3) Mode of spore formation
(4) Fruiting body

120 Identify the type of flowers based on the position of calyx, corolla and androecium with respect to the ovary from the given figures (a) and (b)

(1) (a) Epigynous; (b) Hypogynous
(2) (a) Hypogynous; (b) Epigynous
(3) (a) Perigynous; (b) Epigynous
(4) (a) Perigynous; (b) Perigynous

121 List of endangered species was released by-

(1) GEAC (2) WWF
(3) FOAM (4) IUCN

122 What is the fate of a piece of DNA carrying only gene of interest which is transferred into an alien organism?

A. The piece of DNA would be able to multiply itself independently in the progeny cells of the organism.
B. It may get integrated into the genome of the recipient.
C. It may multiply and be inherited along with the host DNA.
D. The alien piece of DNA is not an integral part of chromosome.
E. It shows ability to replicate.

Choose the correct answer from the options given below:

(1) A and B only
(2) D and E only
(3) B and C only
(4) A and E only

123 Which one of the following can be explained on the basis of Mendel's Law of Dominance?

A. Out of one pair of factors one is dominant and the other is recessive.
B. Alleles do not show any expression and both the characters appear as such in F_2 generation.
C. Factors occur in pairs in normal diploid plants.
D. The discrete unit controlling a particular character is called factor.
E. The expression of only one of the parental characters is found in a monohybrid cross.

Choose the correct answer from the options given below:

(1) A, B and C only
(2) A, C, D and E only
(3) B, C and D only
(4) A, B, C, D and E

124 Inhibition of Succinic dehydrogenase enzyme by malonate is a classical example of:

(1) Cofactor inhibition
(2) Feedback inhibition
(3) Competitive inhibition
(4) Enzyme activation

125 Formation of interfascicular cambium from fully developed parenchyma cells is an example for

(1) Differentiation
(2) Redifferentiation
(3) Dedifferentiation
(4) Maturation

126 Spindle fibers attach to kinetochores of chromosomes during

(1) Prophase (2) Metaphase
(3) Anaphase (4) Telophase

127 Tropical regions show greatest level of species richness because

A. Tropical latitudes have remained relatively undisturbed for millions of years, hence more time was available for species diversification.
B. Tropical environments are more seasonal.
C. More solar energy is available in tropics.
D. Constant environments promote niche specialization.
E. Tropical environments are constant and predictable.

Choose the correct answer from the options given below:

(1) A, C, D and E only
(2) A and B only
(3) A, B and E only
(4) A, B and D only

128 Given below are two statements:

Statement I : Chromosomes become gradually visible under light microscope during leptotene stage.

Statement II : The begining of diplotene stage is recognized by dissolution of synaptonemal complex.

In the light of the above statements, choose the correct answer from the options given below:

(1) Both Statement I and Statement II are true
(2) Both Statement I and Statement II are false
(3) Statement I is true but Statement II is false
(4) Statement I is false but Statement II is true

[Contd...

129 Match List I with List II

List I	List II
A. Nucleolus	I. Site of formation of glycolipid
B. Centriole	II. Organization like the cartwheel
C. Leucoplasts	III. Site for active ribosomal RNA synthesis
D. Golgi apparatus	IV. For storing nutrients

Choose the correct answer from the options given below:

(1) A-III, B-II, C-IV, D-I
(2) A-II, B-III, C-I, D-IV
(3) A-III, B-IV, C-II, D-I
(4) A-I, B-II, C-III, D-IV

130 Bulliform cells are responsible for

(1) Inward curling of leaves in monocots.
(2) Protecting the plant from salt stress.
(3) Increased photosynthesis in monocots.
(4) Providing large spaces for storage of sugars.

131 A pink flowered Snapdragon plant was crossed with a red flowered Snapdragon plant. What type of phenotype/s is/are expected in the progeny?

(1) Only red flowered plants
(2) Red flowered as well as pink flowered plants
(3) Only pink flowered plants
(4) Red, Pink as well as white flowered plants

132 A transcription unit in DNA is defined primarily by the three regions in DNA and these are with respect to upstream and down stream end;

(1) Repressor, Operator gene, Structural gene
(2) Structural gene, Transposons, Operator gene
(3) Inducer, Repressor, Structural gene
(4) Promotor, Structural gene, Terminator

133 In a plant, black seed color (BB/Bb) is dominant over white seed color (bb). In order to find out the genotype of the black seed plant, with which of the following genotype will you cross it?

(1) BB (2) bb
(3) Bb (4) BB/Bb

134 Which of the following are required for the dark reaction of photosynthesis?

A. Light
B. Chlorophyll
C. CO_2
D. ATP
E. NADPH

Choose the correct answer from the options given below:

(1) A, B and C only
(2) B, C and D only
(3) C, D and E only
(4) D and E only

135 Match List I with List II

List I	List II
A. Two or more alternative forms of a gene	I. Back cross
B. Cross of F_1 progeny with homozygous recessive parent	II. Ploidy
C. Cross of F_1 progeny with any of the parents	III. Allele
D. Number of chromosome sets in plant	IV. Test cross

Choose the correct answer from the options given below:

(1) A-I, B-II, C-III, D-IV
(2) A-II, B-I, C-III, D-IV
(3) A-III, B-IV, C-I, D-II
(4) A-IV, B-III, C-II, D-I

[Contd...

Botany : Section-B (Q. No. 136 to 150)

136 The DNA present in chloroplast is:
(1) Linear, double stranded
(2) Circular, double stranded
(3) Linear, single stranded
(4) Circular, single stranded

137 Match List I with List II

List I	List II
A. Robert May	I. Species-Area relationship
B. Alexander von Humboldt	II. Long term ecosystem experiment using out door plots
C. Paul Ehrlich	III. Global species diversity at about 7 million
D. David Tilman	IV. Rivet popper hypothesis

Choose the correct answer from the options given below:
(1) A-II, B-III, C-I, D-IV
(2) A-III, B-I, C-IV, D-II
(3) A-I, B-III, C-II, D-IV
(4) A-III, B-IV, C-II, D-I

138 Match List I with List II

List I	List II
A. Rose	I. Twisted aestivation
B. Pea	II. Perigynous flower
C. Cotton	III. Drupe
D. Mango	IV. Marginal placentation

Choose the correct answer from the options given below:
(1) A-II, B-IV, C-I, D-III
(2) A-I, B-II, C-III, D-IV
(3) A-IV, B-III, C-II, D-I
(4) A-II, B-III, C-IV, D-I

139 Which of the following statement is correct regarding the process of replication in *E.coli*?
(1) The DNA dependent DNA polymerase catalyses polymerization in one direction that is 3'→5'.
(2) The DNA dependent RNA polymerase catalyses polymerization in one direction that is 5'→3'.
(3) The DNA dependent DNA polymerase catalyses polymerization in 5'→3' as well as 3'→5' direction.
(4) The DNA dependent DNA polymerase catalyses polymerization in 5'→3' direction

140 Identify the correct description about the given figure:

(1) Wind pollinated plant inflorescence showing flowers with well exposed stamens.
(2) Water pollinated flowers showing stamens with mucilaginous covering.
(3) Cleistogamous flowers showing autogamy.
(4) Compact inflorescence showing complete autogamy.

141 Match List I with List II

List I	List II
A. Citric acid cycle	I. Cytoplasm
B. Glycolysis	II. Mitochondrial matrix
C. Electron transport system	III. Intermembrane space of mitochondria
D. Proton gradient	IV. Inner mitochondrial membrane

Choose the correct answer from the options given below:
(1) A-I, B-II, C-III, D-IV
(2) A-II, B-I, C-IV, D-III
(3) A-III, B-IV, C-I, D-II
(4) A-IV, B-III, C-II, D-I

142 Read the following statements and choose the set of correct statements:
In the members of Phaeophyceae,
A. Asexual reproduction occurs usually by biflagellate zoospores.
B. Sexual reproduction is by oogamous method only.
C. Stored food is in the form of carbohydrates which is either mannitol or laminarin.
D. The major pigments found are chlorophyll a, c and carotenoids and xanthophyll.
E. Vegetative cells have a cellulosic wall, usually covered on the outside by gelatinous coating of algin.
Choose the correct answer from the options given below:
(1) A, B, C and D only
(2) B, C, D and E only
(3) A, C, D and E only
(4) A, B, C and E only

143 In an ecosystem if the Net Primary Productivity (NPP) of first trophic level is $100x\ (kcal\ m^{-2})\ yr^{-1}$, what would be the GPP (Gross Primary Productivity) of the third trophic level of the same ecosystem?
(1) $\frac{x}{10}\ (kcal\ m^{-2})\ yr^{-1}$
(2) $x\ (kcal\ m^{-2})\ yr^{-1}$
(3) $10x\ (kcal\ m^{-2})\ yr^{-1}$
(4) $\frac{100x}{3x}\ (kcal\ m^{-2})\ yr^{-1}$

144 Match List I with List II

List I	List II
A. GLUT-4	I. Hormone
B. Insulin	II. Enzyme
C. Trypsin	III. Intercellular ground substance
D. Collagen	IV. Enables glucose transport into cells

Choose the correct answer from the options given below:
(1) A-IV, B-I, C-II, D-III
(2) A-I, B-II, C-III, D-IV
(3) A-II, B-III, C-IV, D-I
(4) A-III, B-IV, C-I, D-II

145 Identify the step in tricarboxylic acid cycle, which does not involve oxidation of substrate.
(1) Malic acid → Oxaloacetic acid
(2) Succinic acid → Malic acid
(3) Succinyl-CoA → Succinic acid
(4) Isocitrate → α-ketoglutaric acid

146 Given below are two statements:
Statement I : In C_3 plants, some O_2 binds to RuBisCO, hence CO_2 fixation is decreased.
Statement II : In C_4 plants, mesophyll cells show very little photorespiration while bundle sheath cells do not show photorespiration.
In the light of the above statements, choose the *correct* answer from the options given below:
(1) Both Statement I and Statement II are true
(2) Both Statement I and Statement II are false
(3) Statement I is true but Statement II is false
(4) Statement I is false but Statement II is true

147 Match List I with List II

List I (Types of Stamens)	List II (Example)
A. Monoadelphous	I. Citrus
B. Diadelphous	II. Pea
C. Polyadelphous	III. Lily
D. Epiphyllous	IV. China-rose

Choose the correct answer from the options given below:

(1) A-IV, B-II, C-I, D-III
(2) A-IV, B-I, C-II, D-III
(3) A-I, B-II, C-IV, D-III
(4) A-III, B-I, C-IV, D-II

148 Match List I with List II

List I	List II
A. Frederick Griffith	I. Genetic code
B. Francois Jacob & Jacque Monod	II. Semi-conservative mode of DNA replication
C. Har Gobind Khorana	III. Transformation
D. Meselson & Stahl	IV. *Lac* operon

Choose the correct answer from the options given below:

(1) A-III, B-II, C-I, D-IV
(2) A-III, B-IV, C-I, D-II
(3) A-II, B-III, C-IV, D-I
(4) A-IV, B-I, C-II, D-III

149 Which of the following are fused in somatic hybridization involving two varieties of plants?

(1) Callus
(2) Somatic embryos
(3) Protoplasts
(4) Pollens

150 Spraying sugarcane crop with which of the following plant growth regulators, increases the length of stem, thus, increasing the yield?

(1) Auxin
(2) Gibberellin
(3) Cytokinin
(4) Abscisic acid

Botany : Section-A (Q. No. 101 to 135)

101 Given below are two statements : One is labelled as **Assertion A** and the other is labelled as **Reason R** :
Assertion A : The first stage of gametophyte in the life cycle of moss is protonema stage.
Reason R : Protonema develops directly from spores produced in capsule.
In the light of the above statements, choose the **most appropriate** answer from the options given below :
(1) Both **A** and **R** are correct and **R** is the correct explanation of **A**.
(2) Both **A** and **R** are correct but **R** is NOT the correct explanation of **A**.
(3) **A** is correct but **R** is not correct.
(4) **A** is not correct but **R** is correct.

102 In angiosperm, the haploid, diploid and triploid structures of a fertilized embryo sac sequentially are :
(1) Synergids, Primary endosperm nucleus and zygote
(2) Antipodals, synergids, and primary endosperm nucleus
(3) Synergids, Zygote and Primary endosperm nucleus
(4) Synergids, antipodals and Polar nuclei

103 Movement and accumulation of ions across a membrane against their concentration gradient can be explained by
(1) Osmosis
(2) Facilitated Diffusion
(3) Passive Transport
(4) Active Transport

104 Large, colourful, fragrant flowers with nectar are seen in :
(1) insect pollinated plants
(2) bird pollinated plants
(3) bat pollinated plants
(4) wind pollinated plants

105 The phenomenon of pleiotropism refers to
(1) presence of several alleles of a single gene controlling a single crossover.
(2) presence of two alleles, each of the two genes controlling a single trait.
(3) a single gene affecting multiple phenotypic expression.
(4) more than two genes affecting a single character.

106 Which hormone promotes internode/petiole elongation in deep water rice?
(1) GA_3 (2) Kinetin
(3) Ethylene (4) 2, 4-D

107 Among 'The Evil Quartet', which one is considered the most important cause driving extinction of species?
(1) Habitat loss and fragmentation
(2) Over exploitation for economic gain
(3) Alien species invasions
(4) Co-extinctions

108 Upon exposure to UV radiation, DNA stained with ethidium bromide will show
(1) Bright red colour
(2) Bright blue colour
(3) Bright yellow colour
(4) Bright orange colour

109 Which micronutrient is required for splitting of water molecule during photosynthesis?
(1) manganese (2) molybdenum
(3) magnesium (4) copper

110 Axile placentation is observed in
(1) Mustard, Cucumber and Primrose
(2) China rose, Beans and Lupin
(3) Tomato, Dianthus and Pea
(4) China rose, Petunia and Lemon

111 The process of appearance of recombination nodules occurs at which sub stage of prophase I in meiosis?
(1) Zygotene (2) Pachytene
(3) Diplotene (4) Diakinesis

112 The reaction centre in PS II has an absorption maxima at
(1) 680 nm (2) 700 nm
(3) 660 nm (4) 780 nm

113 Unequivocal proof that DNA is the genetic material was first proposed by
(1) Frederick Griffith
(2) Alfred Hershey and Martha Chase
(3) Avery, Macleoid and McCarthy
(4) Wilkins and Franklin

114 Among eukaryotes, replication of DNA takes place in -
(1) M phase (2) S phase
(3) G_1 phase (4) G_2 phase

115 In tissue culture experiments, leaf mesophyll cells are put in a culture medium to form callus. This phenomenon may be called as -
(1) Differentiation
(2) Dedifferentiation
(3) Development
(4) Senescence

116 Cellulose does not form blue colour with Iodine because
(1) It is a disaccharide.
(2) It is a helical molecule.
(3) It does not contain complex helices and hence cannot hold iodine molecules.
(4) It breakes down when iodine reacts with it.

117 Spraying of which of the following phytohormone on juvenile conifers helps in hastening the maturity period, that leads to early seed production?
(1) Indole-3-butyric Acid
(2) Gibberellic Acid
(3) Zeatin
(4) Abscisic Acid

118 Given below are two statements :
Statement I : The forces generated by transpiration can lift a xylem-sized column of water over 130 meters height.
Statement II : Transpiration cools leaf surfaces sometimes 10 to 15 degrees, by evaporative cooling.
In the light of the above statements, choose the **most appropriate** answer from the options given below :
(1) Both **Statement I** and **Statement II** are correct.
(2) Both **Statement I** and **Statement II** are incorrect.
(3) **Statement I** is correct but **Statement II** is incorrect.
(4) **Statement I** is incorrect but **Statement II** is correct.

119 Family Fabaceae differs from Solanaceae and Liliaceae. With respect to the stamens, pick out the characteristics specific to family Fabaceae but not found in Solanaceae or Liliaceae.
(1) Diadelphous and Dithecous anthers
(2) Polyadelphous and epipetalous stamens
(3) Monoadelphous and Monothecous anthers
(4) Epiphyllous and Dithecous anthers

120 Expressed Sequence Tags (ESTs) refers to
(1) All genes that are expressed as RNA.
(2) All genes that are expressed as proteins.
(3) All genes whether expressed or unexpressed.
(4) Certain important expressed genes.

121 Identify the **correct** statements :
A. Detrivores perform fragmentation.
B. The humus is further degraded by some microbes during mineralization.
C. Water soluble inorganic nutrients go down into the soil and get precipitated by a process called leaching.
D. The detritus food chain begins with living organisms.
E. Earthworms break down detritus into smaller particles by a process called catabolism.
Choose the **correct** answer from the options given below :
(1) A, B, C only (2) B, C, D only
(3) C, D, E only (4) D, E, A only

122 The thickness of ozone in a column of air in the atmosphere is measured in terms of :
(1) Dobson units (2) Decibels
(3) Decameter (4) Kilobase

123 Given below are two statements : One is labelled as **Assertion A** and the other is labelled as **Reason R** :

Assertion A : Late wood has fewer xylary elements with narrow vessels.

Reason R : Cambium is less active in winters.

In the light of the above statements, choose the **correct** answer from the options given below :

(1) Both **A** and **R** are true and R is the correct explanation of **A**.

(2) Both **A** and **R** are true but **R** is NOT the correct explanation of **A**.

(3) **A** is true but **R** is false.

(4) **A** is false but **R** is true.

124 Which of the following stages of meiosis involves division of centromere?

(1) Metaphase I (2) Metaphase II

(3) Anaphase II (4) Telophase

125 The historic Convention on Biological Diversity, 'The Earth Summit' was held in Rio de Janeiro in the year :

(1) 1985 (2) 1992

(3) 1986 (4) 2002

126 How many ATP and $NADPH_2$ are required for the synthesis of one molecule of Glucose during Calvin cycle?

(1) 12 ATP and 12 $NADPH_2$

(2) 18 ATP and 12 $NADPH_2$

(3) 12 ATP and 16 $NADPH_2$

(4) 18 ATP and 16 $NADPH_2$

127 In the equation

$$\boxed{GPP - R = NPP}$$

GPP is Gross Primary Productivity

NPP is Net Primary Productivity

R here is _____.

(1) Photosynthetically active radiation

(2) Respiratory quotient

(3) Respiratory loss

(4) Reproductive allocation

128 During the purification process for recombinant DNA technology, addition of chilled ethanol precipitates out

(1) RNA (2) DNA

(3) Histones (4) Polysaccharides

129 What is the role of RNA polymerase III in the process of transcription in Eukaryotes?

(1) Transcription of rRNAs (28S, 18S and 5.8S)

(2) Transcription of tRNA, 5 srRNA and snRNA

(3) Transcription of precursor of mRNA

(4) Transcription of only snRNAs

130 What is the function of tassels in the corn cob?

(1) To attract insects

(2) To trap pollen grains

(3) To disperse pollen grains

(4) To protect seeds

131 Identify the pair of heterosporous pteridophytes among the following :

(1) *Lycopodium* and *Selaginella*

(2) *Selaginella* and *Salvinia*

(3) *Psilotum* and *Salvinia*

(4) *Equisetum* and *Salvinia*

132 In gene gun method used to introduce alien DNA into host cells, microparticles of _____ metal are used.

(1) Copper

(2) Zinc

(3) Tungsten or gold

(4) Silver

Botany : Section-B (Q. No. 136 to 150)

133 Given below are two statements :
Statement I : Endarch and exarch are the terms often used for describing the position of secondary xylem in the plant body.
Statement II : Exarch condition is the most common feature of the root system.
In the light of the above statements, choose the **correct** answer from the options given below :
(1) Both **Statement I** and **Statement II** are true.
(2) Both **Statement I** and **Statement II** are false.
(3) **Statement I** is correct but **Statement II** is false.
(4) **Statement I** is incorrect but **Statement II** is true.

134 Frequency of recombination between gene pairs on same chromosome as a measure of the distance between genes to map their position on chromosome, was used for the first time by
(1) Thomas Hunt Morgan
(2) Sutton and Boveri
(3) Alfred Sturtevant
(4) Henking

135 Given below are two statements : One is labelled as **Assertion A** and the other is labelled as **Reason R** :
Assertion A : ATP is used at two steps in glycolysis.
Reason R : First ATP is used in converting glucose into glucose-6-phosphate and second ATP is used in conversion of fructose-6-phosphate into fructose-1-6-diphosphate.
In the light of the above statements, choose the **correct** answer from the options given below :
(1) Both **A** and **R** are true and **R** is the correct explanation of **A**.
(2) Both **A** and **R** are true but **R** is NOT the correct explanation of **A**.
(3) **A** is true but **R** is false.
(4) **A** is false but **R** is true.

136 Which one of the following statements is **NOT** correct?
(1) The micro-organisms involved in biodegradation of organic matter in a sewage polluted water body consume a lot of oxygen causing the death of aquatic organisms.
(2) Algal blooms caused by excess of organic matter in water improve water quality and promote fisheries.
(3) Water hyacinth grows abundantly in eutrophic water bodies and leads to an imbalance in the ecosystem dynamics of the water body.
(4) The amount of some toxic substances of industrial waste water increases in the organisms at successive trophic levels.

137 How many different proteins does the ribosome consist of?
(1) 80 (2) 60
(3) 40 (4) 20

138 Which of the following statements are correct about Klinefelter's Syndrome?
A. This disorder was first described by Langdon Down (1866).
B. Such an individual has overall masculine development. However, the feminine development is also expressed.
C. The affected individual is short statured.
D. Physical, psychomotor and mental development is retarded.
E. Such individuals are sterile.
Choose the **correct** answer from the options given below :
(1) A and B only (2) C and D only
(3) B and E only (4) A and E only

139 Match **List I** with **List II** :

List I	**List II**
A. Oxidative decarboxylation	I. Citrate synthase
B. Glycolysis	II. Pyruvate dehydrogenase
C. Oxidative phosphorylation	III. Electron transport system
D. Tricarboxylic acid cycle	IV. EMP pathway

Choose the correct answer from the options given below :
(1) A-III, B-IV, C-II, D-I
(2) A-II, B-IV, C-I, D-III
(3) A-III, B-I, C-II, D-IV
(4) A-II, B-IV, C-III, D-I

140 Given below are two statements : One is labelled as **Assertion A** and the other is labelled as **Reason R** :

Assertion A : A flower is defined as modified shoot wherein the shoot apical meristem changes to floral meristem.

Reason R : Internode of the shoot gets condensed to produce different floral appendages laterally at successive nodes instead of leaves.

In the light of the above statements, choose the **correct** answer from the options given below :

(1) Both **A** and **R** are true and R is the correct explanation of **A**.

(2) Both **A** and **R** are true but **R** is NOT the correct explanation of **A**.

(3) **A** is true but **R** is false.

(4) **A** is false but **R** is true.

141 Given below are two statements : One is labelled as **Assertion A** and the other is labelled as **Reason R** :

Assertion A : In gymnosperms the pollen grains are released from the microsporangium and carried by air currents.

Reason R : Air currents carry the pollen grains to the mouth of the archegonia where the male gametes are discharged and pollen tube is not formed.

In the light of the above statements, choose the **correct** answer from the options given below :

(1) Both **A** and **R** are true and **R** is the correct explanation of **A**.

(2) Both **A** and **R** are true but **R** is NOT the correct explanation of **A**.

(3) **A** is true but **R** is false.

(4) **A** is false but **R** is true.

142 Match **List I** with **List II** :

	List I		**List II**
A.	Cohesion	I.	More attraction in liquid phase
B.	Adhesion	II.	Mutual attraction among water molecules
C.	Surface tension	III.	Water loss in liquid phase
D.	Guttation	IV.	Attraction towards polar surfaces

Choose the **correct** answer from the options given below :

(1) A-II, B-IV, C-I, D-III
(2) A-IV, B-III, C-II, D-I
(3) A-III, B-I, C-IV, D-II
(4) A-II, B-I, C-IV, D-III

143 Which of the following combinations is required for chemiosmosis?

(1) membrane, proton pump, proton gradient, ATP synthase
(2) membrane, proton pump, proton gradient, NADP synthase
(3) proton pump, electron gradient, ATP synthase
(4) proton pump, electron gradient, NADP synthase

144 Melonate inhibits the growth of pathogenic bacteria by inhibiting the activity of

(1) Succinic dehydrogenase
(2) Amylase
(3) Lipase
(4) Dinitrogenase

145 Identify the **correct** statements :

A. Lenticels are the lens-shaped openings permitting the exchange of gases.
B. Bark formed early in the season is called hard bark.
C. Bark is a technical term that refers to all tissues exterior to vascular cambium.
D. Bark refers to periderm and secondary phloem.
E. Phellogen is single-layered in thickness.

Choose the correct answer from the options given below :

(1) B, C and E only
(2) A and D only
(3) A, B and D only
(4) B and C only

146 Match **List I** with **List II** :

List I		**List II**	
A.	M Phase	I.	Proteins are synthesized
B.	G_2 Phase	II.	Inactive phase
C.	Quiescent stage	III.	Interval between mitosis and initiation of DNA replication
D.	G_1 Phase	IV.	Equational division

Choose the correct answer from the options given below :

(1) A-III, B-II, C-IV, D-I

(2) A-IV, B-II, C-I, D-III

(3) A-IV, B-I, C-II, D-III

(4) A-II, B-IV, C-I, D-III

147 Match **List I** with **List II** :

List I (Interaction)		**List II (Species A and B)**	
A.	Mutualism	I.	+(A), O(B)
B.	Commensalism	II.	−(A), O(B)
C.	Amensalism	III.	+(A), −(B)
D.	Parasitism	IV.	+(A), +(B)

Choose the **correct** answer from the options given below :

(1) A-IV, B-II, C-I, D-III

(2) A-IV, B-I, C-II, D-III

(3) A-IV, B-III, C-I, D-II

(4) A-III, B-I, C-IV, D-II

148 Given below are two statements :

Statement I : Gause's 'Competitive Exclusion Principle' states that two closely related species competing for the same resources cannot co-exist indefinitely and competitively inferior one will be eliminated eventually.

Statement II : In general, carnivores are more adversely affected by competition than herbivores.

In the light of the above statements, choose the **correct** answer from the options given below :

(1) Both **Statement I** and **Statement II** are true.

(2) Both **Statement I** and **Statement II** are false.

(3) **Statement I** is correct but **Statement II** is false.

(4) **Statement I** is incorrect but **Statement II** is true.

149 Match **List I** with **List II** :

List I		**List II**	
A.	Iron	I.	Synthesis of auxin
B.	Zinc	II.	Component of nitrate reductase
C.	Boron	III.	Activator of catalase
D.	Molybdenum	IV.	Cell elongation and differentiation

Choose the correct answer from the options given below :

(1) A-III, B-II, C-I, D-IV

(2) A-II, B-III, C-IV, D-I

(3) A-III, B-I, C-IV, D-II

(4) A-II, B-IV, C-I, D-III

150 Main steps in the formation of Recombinant DNA are given below. Arrange these steps in a correct sequence.

A. Insertion of recombinant DNA into the host cell.

B. Cutting of DNA at specific location by restriction enzyme.

C. Isolation of desired DNA fragment.

D. Amplification of gene of interest using PCR.

Choose the correct answer from the options given below :

(1) B, C, D, A (2) C, A, B, D

(3) C, B, D, A (4) B, D, A, C