SUBJECT : BOTANY

SECTION - A

101. Movement and accumulation of ions across a membrane against their concentration gradient can be explained by :

(1) Facilitated Diffusion (2) Passive Transport

(3) Active transport (4) Osmosis

Ans. (3)

Sol. Movement against of ions across a membrane against the concentration gradient is known as active transport.

102. Among 'The Evil Quartet' which one is considered the most important cause driving extinction of species ?

(1) Over exploitation for economic gain (2) Alien species invasions

(3) Co-extinctions (4) Habitat loss and fragmentation

Ans. (4)

Sol. Most important cause of species extinction is habitat loss & fragmentation

103. Identify the pair of heterosporous pteridophytes among the following :

(1) *Selaginella* and *Salvinia* (2) *Psilotum* and *Salvinia*

(3) *Equisetum* and *Salvinia* (4) *Lycopodium* and *Selaginella*

Ans. (1)

Sol. Heterosporous pteridophytes are selaginella, salvinia, Azolla, Marsielia.

104. Frequency of recombination between gene pairs on same chromosome as measureof the distance between genes to map their position on chromosome, was used for the first time by :

(1) Sutton and Boveri (2) Alfred strutevant

(3) Henking (4) Thomas Hunt Morgan

Ans. (2)

105. What is the function of tassels in the corn cob ?

(1) To trap pollen grains

(2) To disperse pollen grains

(3) To protect seeds

(4) To attract insects

Ans. (1)

Sol. Male flower of maize plant possess tassles.

106. Identify the **correct** statements :

A. Detrivores perform fragementation

B. The humus is further degraded by some microbes during mineralization

C. Water soluble inorganic nutrients go down into the soil and get precipated 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) B, C, D only

(2) C, D, E only

(3) D, E, A only

(4) A, B, C only

Ans. (4)

Sol. A – Correct statement

B – Correct statement

C – Correct statement

D – Dertritus food chain begins with **dead organic matter**

E – Earthworm break down detritus into smaller particles by a process called **fragmentation**.

107. 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 ligt of the above statements, choose the **correct** answer from the options given below :

(1) Both A and R are true but R is not the correct explanation of A

(2) A is true but R is false.

(3) A is false but R is true

(4) Both A and R are true and R is the correct explanation of A

Ans. (4)

108. The process of appearnace of recombination nodules occurs at which sub stage of prophase In meiosis ?

(1) Pachytene (2) Diplotene (3) Diakinesis (4) Zygotene

Ans. (1)

Sol. Crossing over occurs in pachytene stage. It is aided by recombination nodule which is composed of enzymes like recombinase.

109. Which of the following stages of meiosis involves division of centromere ?

(1) Metaphase II (2) Anaphase II (3) Telophase (4) Metaphase I

Ans. (2)

Sol. Division of centromere occurs during anphase & Anaphae-II

110. During the purification process for recombinant DNA technology, addition of chilled ethanol precipitates out :

(1) DNA (2) Histones (3) Polysaccharides (4) RNA

Ans. (1)

Sol. Purified DNA in the process of recombinant DNA technology precipitate out after the addition of chilled ethanol.

111. 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) Polyadephoous and epipetalous stamens

(2) Monoadelphous and Monothecous anthers

(3) Epiphyllous and Dithecous anthers

(4) Diadelphous and Dithecous anthers

Ans. (4)

Sol. Stamens in fabaceae shows diadephaous condition.

112. Large, colourful, fragrant flowers with nectar are seen in :

(1) Bird pollinated plants

(2) Bat pollinated plants

(3) Wind pollinated plants

(4) Insect pollinated plants

Ans. (4)

Sol. Insect pollinated plants posses flowers with following conditions :

– Large flowers

– Colourful

– Fragrant

– Nector rich

113. Spraying of which of the following phytohormone on juvenile conifers helps in hastening the maturity period, that leads to early seed production ?

(1) Gibberellic Acid

(2) Zeatin

(3) Abscisic Acid

(4) Indole-3- butyric acid

Ans. (1)

114. Axile placentation is observed in :

(1) China rose, Beans and Lupin
(2) Tomato, Dianthus and Pea
(3) China rose, Petunia and Lemon
(4) Mustard, Cucumber and Primrose

Ans. (3)

Sol. In Axile placentation placenta is located at the Axis of the ovary e.g. China rose, Petunia, Lemon, tomato.

115. Among eukaryotes, replication of DNA takes palce in :

(1) S phase (2) G_1 phase (3) G_2 phase (4) M phase

Ans. (1)

Sol. In S–phae 'S' stands for the synthesis of DNA which is known as replication and this occurs in S– phase

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

(1) 18 ATP and 12 $NADPH_2$
(2) 12 ATP and 16 $NADPH_2$
(3) 18 ATP and 16 $NADPH_2$
(4) 12 ATP and 12 $NADPH_2$

Ans. (1)

Sol. For the synthesis of one glucose molecule during calvin cycle in chloroplast, 18 ATP & 12 NADPH + H^+ are required.

117. In gene gun method used to introduce alien DNA into hose cells, microparticles of _____metal are used.

(1) Zinc
(2) Tungsten or gold
(3) Silver
(4) Copper

Ans. (2)

Sol. In gene gun method (biolistics) used to introduce alien DNA into host plant cells micro particles of Tungsten or gold metals are used.

118. The thickness of ozone in a column of air in the atmosphere is measure in terms of :

(1) Decibles
(2) Decameter
(3) Kilobase
(4) Dobson units

Ans. (4)

119. Unequivocal proof that DNA is the genetic material was first proposed by :

(1) Alfred Hershey and Martha Chase
(2) Averym, Macleoid and McCarthy
(3) Wilkins and Franklin
(4) Frederic Griffith

Ans. (1)

120. In the equation

GPP – R = NPP

GPP is Gross Primary Productivity

NPP is Net Primary Productivity

R here is _____.

(1) Respiratory quotient
(2) Respiratory loss
(3) Reproductive allocation
(4) Photosynthetically active radiation

Ans. (2)

Sol. R – Respiratory loss occuring in the plants

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

(1) Transcription of tRNA, 5 srRNA and snRNA

(2) Transcription of precusor of mRNA

(3) Transcription of of only srRNAs

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

Ans. (1)

Sol. RNA polymerase III transcribes the following RNAs.

– tRNA

– 5 srRNA

– snRNA

122. Which micronutrient is required for splitting of water molecule during photosythesis ?

(1) Molybdenum

(2) Magnesium

(3) Copper

(4) Manganese

Ans. (4)

Sol. Photolysis of water requires manganses and chlorine

123. In angiosperm, the haploid, diploid and triploid structures of a fertilized embryo sac sequentially are :

(1) Antipodals, synergids and primary endosperm nucleus

(2) Synergids, Zygote and Primary endosperm nucleus

(3) Synergids, antipodals and Polar nuclei

(4) Synergids, Primary endosperm nucleus and zygote

Ans. (2)

Sol. In an embryo sac

Structure		**Ploidy**
Antipodals	–	n
Synergids	–	n
Egg cell	–	n
Polar nuclei	–	n
Primary endosperm nucleus	–	3n

124. The phenomenon of pleiotropism refers to :

(1) Presence of two alleles, each of the two genes controlling a single trait

(2) A single gene affecting multiple phenotypic expression

(3) More than two genes affecting a single character.

(4) Presence of several alleles of a single gene controlling a single cross over.

Ans. (2)

Sol. If a single gene affects the phenotypic expression of more than one gene then this phenomenon is known as pleiotropism.

125. 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 option given below

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

(2) A is true but R is false.

(3) A is false but R is true.

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

Ans. (4)

126. Cellulose does not form blue colour with Iodine because -

(1) It is a helical molecule.

(2) It does not contain complex helices and hence cannot hold iodine molecules.

(3) It breakes down when iodine reacts with it.

(4) It is a disaccharide.

Ans. (2)

Sol. It does not contain complex helices and hence cannot hold iodine molecules.

127. Which hormone promotes internode/petiole elongation in deep water rice ?

(1) Kinetin (2) Ethylene (3) 2, 4-D (4) GA_3

Ans. (2)

Sol. Ethylene promotes internode or petiole elongation in deep water plants like rice.

128. Expressed Sequence Tags (ESTs) refers to -

(1) All genes that are expressed as proteins.

(2) All genes whether expressed or unexpressed.

(3) Certain important expressed genes.

(4) All genes that are expressed as RNA.

Ans. (4)

Sol. EST is one of the methodologies used for the sequencing of human genome in HGP. It represents all genes that are expressed as RNA

129. 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 evaporaive coling.

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 incorrect.

(2) Statement I is correct but Statement II is incorrect.

(3) Statement I is incorrect but Statement II is correct.

(4) Both Statement I and Statement II are correct.

Ans. (4)

130. Upon exposure to UV radiation, DNA stained with ethidium bromide will show -

(1) Bright blue colour (2) Bright yellow colour

(3) Bright orange colour (4) Bright red colour

Ans. (3)

Sol. Ethidium bromide provide bright orange colour to DNA

131. The historic Concention on Biological Diversity, 'The Earth Summit' was held in Rio de Janeiro in the year :

(1) 1992 (2) 1986 (3) 2002 (4) 1985

Ans. (1)

132. The reaction centre in PS II has an absorption maxima at -

(1) 700 nm (2) 660 nm

(3) 780 nm (4) 680 nm

Ans. (4)

133. 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 in 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 option given below :

(1) Both A and R are correct but R is NOT the correct explanation of A.

(2) A is correct but R is not correct.

(3) A is not correct but R is correct.

(4) Both A and R are correct and R is the correct explanation of A.

Ans. (4)

134. In tissue culture experiments, leaf mesophyll cells are put in a culture medium to form callus. This phenomenon may be called as :

(1) Dedifferentiation

(2) Development

(3) Senescence

(4) Differentiation

Ans. (1)

Sol. Leaf mesophyll cells in the culture firstly gets dedifferentiated to regain the property of cell division and eventually it leads to the formation of callus.

135. 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 option given below:

(1) Both Statement I and Statement II are false.

(2) Statement I is correct but Statement II is false.

(3) Statement I is incorrect but Statement II is true.

(4) Both Statement I and Statement II are true.

Ans. (3)

Sol. Statement - I : Endarch and exarch are the terms often used for describing the position of **primary** xylem in the plant body

SECTION - B

136. 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 option given below :

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

Ans. (1)

Sol. B – Bark formed early season, are **soft** bark.

C – Bark is **non**-technical terms

E – Phellogen is present in a couple of layers.

137. 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 towatds polar surfaces

Choose the correct answer from the options given below :

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

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

Ans. (4)

Sol. Cohesion – Mutual attraction

Adhesion – Attraction between water and surface

Surface tension –More in liquid phase than in gaseous phase.

Gultation – Loss of H_2O in liquid phase

138. 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 replacation
D. G_1 Phase	IV. Equational division

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-II, B-IV, C-I, D-III

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

Ans. (2)

Sol. Mitosis (Mphase) – Equational division

Go (Quiescent stage) – Inactive phase because cells in G_0 phase do not proliferate

G_1 – Proteins

G_2 – Occurs between S-phase of M-Phase

139. Which of the following statement are **correct** about Klinefelter's Syndrome ?

A. This disorder wast first discribed 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 retraded.

E. Such individuals are sterile.

Choose the correct answer from the options given below :

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

Ans. (2)

Sol. Statement A, C and D are the characterstic of down syndrome.

140. Given below are two statements :

Statement I : Gause's 'Competitive Exclusion Principle' states that two closely related species competing for the same resources cannot coexits 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 false.

(2) Statement I is correct but Statement II is false.

(3) Statement I is incorrect but Statement II is true.

(4) Both Statement I and Statement II are true.

Ans. (2)

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

141. How many different proteins does the ribosome consist of ?

(1) 60 (2) 40

(3) 20 (4) 80

Ans. (4)

Sol. Eukrayotic Ribosome – 79 – 80 different proteins

142. Which of the following combinations is required for chemiosmosis ?

(1) membrane, proton pump, proton gradient, NADP synthase

(2) proton pump, electron gradient, ATP synthase

(3) proton pump, electron gardient, NADP synthase

(4) membrane, proton pump, proton gradient, ATP synthase

Ans. (4)

Sol. Chemiosmosis requires

Intact Membrane

Proton pump

ATP synthetase proton gradient.

143. Which one of the following statement is **NOT** correct ?

(1) Algal blooms caused by excess of organic matter in water improve water quality and promote fisherises.

(2) Water hyacinth grows abundantly in eutrophic water bodies and leads to an imbalance in the ecosystem dynamics of the water body.

(3) The amount of some toxic substances of industrial waste water increases in the organisms at successive trophic levels.

(4) 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.

Ans. (1)

Sol. Algal blooms increase B.O.D and result in death of fishes

144. 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-I, C-II, D-III

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

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

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

Ans. **(1)**

Sol. Mutualism = +, +

Commensalism = +, 0

Amensalism = –, 0

Parasitism = +, –

145. 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) C, A, B, D

(2) C, B, D, A

(3) B, D, A, C

(4) B, C, D, A

Ans. (4)

Sol. Steps of recombinant DNA are :

Cutting of DNA at specific location by restriction enzyme.

Isolation of desired DNA fragment.

Amplification of gene of interest using PCR.

Insertion of recombinant DNA into the host cell.

146. 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 elogation and differentiation

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

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

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

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

Ans. (2)

Sol. Zinc – help in Auxin synthesis

Iron – Catalse enzyme Activator

Mo – Nitrate Reductase

Boron – Cell elogation and differentiation

147. 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

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

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

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

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

Ans. **(3)**

Sol. A. Oxdative decarboxylation – Pyruvate dehydrogenase In link reaction

D. TCA cycle – Citrate synthase catalyse the formation of citrate

148. Given below are two-statement : 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 asnwer from the options given below :

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

(2) A is true but R is false.

(3) A is false but R is true.

(4) Both A and R are treu and R is the correct explanation of A.

Ans. (2)

Sol. Air currents carry the pollen grains to the mouth of the archegonia where the male gametes are discharged and pollen tube is formed.

149. 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 but R is NOT the correct explanation of A.

(2) A is true but R is false.

(3) A is false but R is true.

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

Ans. (4)

150. Melonate inhibits the growth of pathogenic bacterial by inibiting the activity of -

(1) Amylase

(2) Lipase

(3) Dinitrogenase

(4) Succinic dehydrogenase

Ans. (4)

Sol. Melonate is a competitive inhabitor for succinic dehydrogenase

SUBJECT : ZOOLOGY

SECTION - A

151. Given below are two statements :

Statement I : A protein is imagined as a line, the left end represented by amino acid (C-terminal) and the right end represented by last amino acid (N-terminal).

Statement II : Adult human haemoglobin, consists of 4 subunits (two subunits of α type and two subunits of β type).

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

(1) Both statement I and statement II are false

(2) Statement I is true but statement II is false

(3) Statement I is false but statement II is true

(4) Both statement I and statement II are true

Ans. (3)

Sol. – A protein is imagined as a line left end represented by first amino acid (N-terminal) and the right and represented by last amino acid (C-terminal).

– Adult human haemoglobin consists of 4 subunits (2α and 2β)

152. Radial symmetry is NOT found in adults of phylum _____.

(1) Hemichordata

(2) Coelenterata

(3) Echinodermata

(4) Ctenophora

Ans. (1)

Sol. – Radial symmetry is found in colenterata, ctenophora and adult echinodermata.

– Hemicordates have bilateral symmetry.

153. Which of the following statements are correct regarding female reproductive cycle ?

A. In non-primate mammals cyclical changes during reproduction are called oestrus cycle.

B. First menstrual cycle begins at puberty and is called menopause.

C. Lack of menstruation may be indicative of pregnancy.

D. Cyclic menstruation extends between menarche and menopause.

Choose the **most appropriate** answer from the options given below :

(1) A and B only

(2) A, B and C only

(3) A, C and D only

(4) A and D only

Ans. (3)

Sol. A. In non-primate mammals cyclical changes during reproduction are called oestrus cycle.

B. First menstural cycle begins at puberty and is called menarche.

C. Lack of menstruation may be indicative of pregnancy.

D. Cyclic menstruation extends between menarche and menopause.

154. Given below are two statements : one is labelled as **Assertion A** and the other is labelled as **Reason R**.

Assertion A : Nephrons are two types : Cortical and Juxta medullary, based on their relative position in cortex and medulla.

Reason R : Juxta medullary nephrons have short loop of Henle whereas, cortical nephrons have longer loop of Henle.

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

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

(2) **A** is true but **R** is false

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

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

Ans. (2)

Sol. Henle loop of juxta medullary nephrons is long while Henle loop of cortical nephron is small.

155. Match **List I** with **List II** with respect to human eye.

List I	List II
A. Fovea	I. Visible coloured portion of eye that regulates diameter of pupil
B. Iris	II. External layer of eye formed of dense connective tissue
C. Blind spot	III. Point of greatest visual acuity or resolution
D. Sclera	IV. Point where active nerve leaves the eyeball and photoreceptor cells are absent

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

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

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

Ans. **(4)**

Sol. Fovea - Point of greatest visual acuity or resolution

Iris - Visible coloured portion of eye that regulates diameter of pupil

Blind spot - Point where active nerve leaves the eyeball and photoreceptor cells are absent

Sclera - External layer of eye formed of dense connective tissue

156. Which of the following **NOT** considered as the part of endomembrane system ?

A. Mitochondria

B. Endoplasmic Reticulum

C. Chloroplasts

D. Golgi complex

E. Peroxisomes

Choose the **most appropriate** answer from the options given below :

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

Ans. **(1)**

Sol. Endomembrane system consists of - Golgi body, ER, lysosome and vacuole.

157. Broad palm with single palm crease is visible in a person suffering from :

(1) Turner's syndrome (2) Klinefelter's syndrome

(3) Thalassemia (4) Down's syndrome

Ans. (4)

158. Match List I with List II.

List I		List II
A. P-wave	I.	Beginning of systole
B. Q-wave	II.	Repolarisation of ventricles
C. QRS complex	III.	Depolarisation of atria
D. T-wave	IV.	Depolarisation of ventricles

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

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

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

Ans. (4)

Sol. P-wave - Depolarisation of atria

Q-wave - Beginning of systole

QRS complex - Depolarisation of ventricles

T-wave - Repolarisation of ventricles

159. Which one of the following common sexually transmitted diseases is completely curable when detected early and treated properly ?

(1) Gonorrhoea (2) Hepatitis-B (3) HIV infection (4) Genital herpes

Ans. (1)

Sol. Hepatitis-B, HIV infection and genital herpes are not completely curable. Gonorrhoea is curable.

160. Match List I with List II.

List I (Cells)	List II (Secretion)
A. Peptic cells	I. Mucus
B. Goblet cells	II. Bile juice
C. Oxyntic cells	III. Proenzyme pepsinogen
D. Hepatic cells	IV. HCl and intrinsic factor for absorption of vitamin B_{12}

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

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

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

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

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

Ans. **(2)**

Sol. Peptic cells - Proenzyme pepsinogen

Goblet cells - Mucus

Oxyntic cells - HCl and intrinsic factor for absorption of vitamin B_{12}

Hepatic cells - Bile juice

161. Given below are two statements : one is labelled as **Assertion A** and the other is labelled as **Reason R**.

Assertion A : Endometrium is necessary for implantation of blastocyst.

Reason R : In the absence of fertilization, the corpus luteum degenerates that causes disintegration of endometrium.

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

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

(2) **A** is true but **R** is false

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

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

Ans. **(1)**

Sol. Both **A** and **R** are true but **R** is NOT the correct explanation of **A**

162. Which of the following is not a cloning vector ?

(1) YAC (2) pBR322

(3) Probe (4) BAC

Ans. **(3)**

Sol. YAC, BAC and pBR322 are cloning vector but probe is used for detection of mutated gene.

163. Match List I with List II.

List I		**List II**
A. *Taenia*	I.	Nephridia
B. *Paramoecium*	II.	Contractile vacuole
C. *Periplaneta*	III.	Flame cells
D. *Pheretima*	IV.	Urecose gland

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

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

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

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

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

Ans. **(2)**

Sol. *Taenia* - Flame cells

Paramoecium - Contractile vacuole

Periplaneta - Urecose gland

Pheretima - Nephridia

164. Given below are two statements :

Statement I : Ligaments are dense irregular tissue.

Statement II : Cartilage is dense regular tissue.

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

(1) Both **statement I** and **statement II** are false

(2) **Statement I** is true but **statement II** is false

(3) **Statement I** is false but **statement II** is true

(4) Both **statement I** and **statement II** are true

Ans. (1)

Sol. Both **statement I** and **statement II** are false

Ligaments are dense regular connective tissue while cartilage are specialised connective tissue.

165. Which of the following functions is carried out by cytoskeleton in a cell ?

(1) Protein synthesis (2) Motiliity (3) Transportation (4) Nuclear division

Ans. (2)

Sol. Cytoskeleton is responsible for maintaining shape of the cell, cell division and motility.

166. Match List I with List II.

List I	**List II**
A. Gene 'a'	I. β-galactosidase
B. Gene 'y'	II. Transacetylase
C. Gene 'i'	III. Permease
D. Gene 'z'	IV. Repressor protein

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

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

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

Ans. (1)

Sol. Page no. 117 Fig. 6.14 (NCERT)

167. Which of the following statements is **correct** ?

(1) Biomagnification refers to increase in concentration of the toxicant at successive trophic levels

(2) Presence of large amount of nutrients in water restricts 'Algal Bloom'

(3) Algal Bloom decreases fish mortality

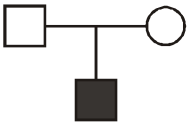
(4) Eutrophication refers to increase in domestic sewage and waste water in lakes

Ans. (1)

Sol. Biomognification refers to increase in concentration of toxicant such as DDT in successive trophic levels

168. Which one of the following symbols represents mating between relatives in human pedigree analysis ?

(1) 

(2) 

(3) 

(4) 

Ans. (1)

Sol.  Represent marriges between close relatives.

169. Once the undigested and unabsorbed substances enter the caecum, their backflow is prevented by :

(1) Ileo - caecal valve

(2) Gastro - oesophageal sphincter

(3) Pyloric sphincter

(4) Sphincter of Oddi

Ans. (1)

Sol. Page No. 264

The undigested & unabsorbed substances called faecal matter (faeces) enter into the caecum of large intastine through Ileo-caecal valve which prevent the backflow.

170. Which one of the following techniques does not serve the purpose of early diagnosis of a disease for its early treatment ?

(1) Serum and Urine analysis

(2) Polymerase Chain Reaction (PCR) technique

(3) Enzyme Linked Immuno-Sorbent Assay (ELISA) technique

(4) Recombinant DNA technology

Ans. (1)

Sol. Page No. 212

Conventional method not for early detection & diagnosis of diseases

(a) Serum & Urine analysis

Methods for early detection :

PCR

ELISA

RDT

171. Given below are two statements :

Statement I : Low temperature preserves the enzyme in a temporarily inactive state whereas high temperature destroys enzymatic activity because proteins are denaturated by heat.

Statement II : When the inhibitor closely resembles the substrate in its molecular structure and inhibits the activity of the enzyme, it is known as competitive inhibitor.

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

(1) Both **statement I** and **statement II** are false

(2) **Statement I** is true but **statement II** is false

(3) **Statement I** is false but **statement II** is true

(4) Both **statement I** and **statement II** are true

Ans. (4)

Sol. Page No. 157-158

Low temprature – temporary inactive enzyme activity

High temprature – enzyme denaturation because enzymes are proteins.

Competative inhibition – Inhibitor resemble to substrate, inhibitor inhibit enzyme activity

Enzyme have common binding site for substrate and inhibitor

172. Match List I with List II.

List I (Type of Joint)		**List II (Found between)**
A. Cartilaginous joint	I.	Between flat skull bones
B. Ball and socket joint	II.	Between adjacent vertebrae in vertebral column
C. Fibrous joint	III.	Between carpal and metacarpal of thumb
D. Saddle joint	IV.	Between humerus and pectoral girdle

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

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

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

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

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

Ans. **(1)**

Sol. Page No. 312

Cartilaginous joint	Between adjacent vertebrae
Fibrous joint	Between flat bone of skull
Synovial joint	
Ball and socket	Pectural girdle & humurus (Glenoid cavity)
Saddle joint	Between the carpal & metacarpal of thumb

173. Given below are two statements :

Statement I : Vas deferens receives a duct from seminal vesicle and opens into urethra as the ejaculatory duct.

Statement II : The cavity of the cervix is called cervical canal which along with vagina forms birth canal.

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

(1) Both **statement I** and **statement II** are false

(2) **Statement I** is correct but **statement II** is false

(3) **Statement I** is incorrect but **statement II** is true

(4) Both **statement I** and **statement II** are true

Ans. **(4)**

Sol. Page No. 43

Vas deferens receives a duct from seminal vesicle and opens into urethra as the ejaculatory duct.

Cervical canal + vagina = Birth canal

174. In which blood corpuscles, the HIV undergoes replication and produces progeny viruses ?

(1) B-lymphocytes

(2) Basophils

(3) Eosinophis

(4) T_H cells

Ans. **(4)**

Sol. Page No. 156

HIV undergoes replication & produces progeny virus in helper T-cells

175. Match List I with List II.

List I		List II
A. Heroin	I.	Effect on cardiovascular system
B. Marijuana	II.	Slow down body function
C. Cocaine	III.	Painkiller
D. Morphine	IV.	Interfere with transport of dopamine

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

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

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

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

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

Ans. **(4)**

Sol. Page No. 159

Heroine (diacetylated morphine – Sedative slow down body function)

Marijuana – (Cannibinoids) effect cardiovascular system

Cocaine – Interfere with transport of neurotransmitter dopamine.

Morphine – Saditive painkiller, obtained from latex of poppy plant.

176. Vital capacity of lung is

(1) IRV + ERV + TV + RV

(2) IRV + ERV + TV – RV

(3) IRV + ERV + TV

(4) IRV + ERV

Ans. **(3)**

Sol. Page No. 272

Vital capacity = IRV + ERV + TV

177. Select the correct group/set of Australian marsupials exhibiting adaptive radiation.

(1) Numbat, Spotted cuscus, Flying phalanger

(2) Mole, Flying squirrel, Tasmanian tiger cat

(3) Lemur, Anteater, Wolf

(4) Tasmanian wolf, Bobcat, Marsupial mole

Ans. (1)

Sol. Page No. 134

Australian marsupials – Numbat, Spotted cuscus, Flying phalanger

178. Match List I with List II.

List I	**List II**
A. CCK	I. Kidney
B. GIP	II. Heart
C. ANF	III. Gastric gland
D. ADH	IV. Pancreas

Choose the correct answer from the options given below :

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

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

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

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

Ans. (4)

Sol.

Hormone	**Target**
A. CCK	I. Pancreas
B. GIP	II. Gastric gland
C. ANF	III. Heart
D. ADH	IV. Kidney

179. Given below are two statements : one is labelled as **Assertion A** and the other is labelled as **Reason R.**

Assertion A : Amniocentesis for sex determination is one of the strategies of Reproductive and Chid Health Care Programme.

Reason R : Ban on amniocentesis checks increasing menace of female foeticide.

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 NOT the correct explanation of A.

(2) A is true but R is false.

(3) A is false but R is true.

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

Ans. (3)

Sol. Amniocentesis is not for sex determination and it checks female foeticide cases.

180. Given below are two statements:

Statements I : RNA mutates at a faster rate.

Statements II : viruses having RNA genome and shorter life span mutate and evolve faster.

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

(1) Both Statement I and statement II are false.

(2) Statement I is true but statement II is false.

(3) Statement I false but statement II is true.

(4) Both Statement I and statement II are true.

Ans. (4)

Sol. RNA mutates as faster rate as it is an unstable genetic material found in certain virus.

181. Math List I and List II

List I	List II
A. Vasectomy	I. Oral method
B. Coitus interruptus	II. Barrier method
C. Cervical caps	III. Surgical method
D. Saheli	IV. Natural method

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

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

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

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

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

Ans. **(1)**

Sol.

Example	Method
A. Vasectomy	I. Surgical method
B. Coitus interruptus	II. Natural method
C. Cervical caps	III. Barrier method
D. Saheli	IV. Oral method

182. Given beow are two statements :

Statement I : Electrostatic precipitator is most widely used in thermal power plant.

Statement II : Electrostatic precipitator in thermal power plant removes ionising radiations

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 incorrect.

(2) Statement I is correct but Statement II is incorrect.

(3) Statement I incorrect but Statement II is correct.

(4) Both Statement I and Statement II are correct.

Ans. (2)

Sol. Electrostatic precipitator in thermal power plant removes dust partcles by ionising.

183. Given below are two statements :

Statement I : In prokaryotes, the positively charged DNA is held with some negatively charged proteins in a region called nucleoid.

Statement II : In eukaryotes, the negatively charged DNA is wrapped around the positively charged histone octamer to form nucleosome.

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

(1) Both Statement I and Statement II are incorrect.

(2) Statement I is correct but Statement II is incorrect.

(3) Statement I incorrect but Statement II is correct.

(4) Both Statement I and Statement II are correct.

Ans. (3)

Sol. DNA is negatively charged in both prokaryotes and eukaryotes.

184. Match List I with List II.

List I	**List II**
A. Ringworm	I. Haemophilus influenzae
B. Filariasis	II. Trichophyton
C. Malaria	III. Wuchereria bancrofti
D. Pneumonia	IV. Plasmodium vivax

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

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

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

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

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

Ans. (4)

Sol.

Diseases	**Causative Agents**
A. Ringworm	I. Trichophyton
B. Filariasis	II. Wuchereria bancrofti
C. Malaria	III. Plasmodium vivax
D. Pneumonia	IV. Haemophilus influenzae

185. Match List I wit List II.

List I **(Interacting species)**	**List II** **(Name of Interaction)**
A. A Leopard and a Lion in a forest/grasaland	I. Competition
B. A Cuckoo laying egg in a Crow's nest	II. Brood parasitism
C. Fungi and root of a higher plant in Mycorrhizae	III. Mutualism
D. A cattle egret and a Cattle in a field	IV. Commensalism

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

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

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

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

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

Ans. **(4)**

Sol. Brood parasitism a Cuckoo laying egg in a Crow's nest

Mutualism = +, + Interaction

Leopard and lions compete for same natural resource and food.

SECTION - B

186. Which of the following statements are correct ?

A. Basophils are most abundant cells of the total WBCs

B. Basophils secrete histamine, serotonin and heparin

C. Basophils are involved in inflammatory response

D. Basophils have kidney shaped nucleus

E. Basophils are agranulocytes

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

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

Ans. (2)

Sol. Basophils (0.5 to 1%) are granulocytes with S-shape nuclei and it secretes histamine, heparin and serotonin etc.

187. Math List I with List II.

List I	**List II**
A. Mast cells	I. Ciliated epithelium
B. Inner surface of bronchiole	II. Areolar connective tissue
C. Blood	III. Cuboidal epithelium
D. Tubular parts of nephron	IV. Specialised connective tissue

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

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

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

Ans. (2)

Sol.

List I	List II
A. Mast cells	I. Areolar connective tissue
B. Inner surface of bronchiole	II. Ciliated epithelium
C. Blood	III. Specialised connective tissue
D. Tubular parts of nephron	IV. Cuboidal epithelium

188. Select the correct statements.

A. Tetrad formation is seen during Leptotene.

B. During Anaphase, the centromeres split and chromatids separate.

C. Terminalization takes place during Pachytene.

D. Nucleolus, Golgi complex and ER are reformed during Telophase.

E. Crossing over takes place between sister chromatids of homologous chromosome.

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

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

Ans. **(1)**

Sol. Tetrad formation is visible in pachytene.

Terminalization of chiasmata occurs in diakinesis.

Crossing over occurs between non-sister chromatids of homologous chromosomes.

189. In cockroach, excretion is brought about by –

A. Phallic gland B. Urecose gland

C. Nephrocytes D. Fat body

E. Collaterial glands

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

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

(3) B and D only (4) A and E only

Ans. (2)

Sol. Fat body, Urecose glands and Nephrocytes helps in excretion in cockroach.

190. Given below are two statements :

Statement I : During G_0 phase of cell cycle, the cell is metabolically inactive.

Statement II : The centrosome undergoes duplication during S phase of interphase.

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 incorrect.

(2) Statement I is correct but Statement II is incorrect.

(3) Statement I incorrect but Statement II is correct.

(4) Both Statement I and Statement II are correct.

Ans. (3)

Sol. During G_0, cell is metabollically active.

191. Select the correct statements with reference to chordates.

A. Presence of a mid-dorsal, solid and double nerve cord.

B. Presence of closed circulatory system.

C. Presence of paired pharyngeal gill slits.

D. Presence of dorsal heart.

E. Triploblastic pseudocoelomate animals.

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

(1) B and C only

(2) B, D and E only

(3) C, D and E only

(4) A, C and D only

Ans. (1)

Sol. In chordates :

(I) Notochord present

(II) Central nervous system is dorsal hollow and single

(III) Pharynx preforated by gill slits

(IV) Heart is ventral

(V) A post-anal part (tail) is present

(VI) Coelomate

192. Math List I with List II.

List I	**List II**
A. Logistic growth	I. Unlimited resource availability condition
B. Exponential growth	II. Limited resource availability condition
C. Expanding age pyramid	III. The percent individuals of pre-reproductive age is largest followed by reproductive and post reproductive
D. Stable age pyramid	IV. The percent individuals of pre-reproductives and reproductive age group are-same

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

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

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

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

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

Ans. (4)

193. Which one of the following is the sequence on corresponding coding strand, if the sequence on mRNA formed is as follows

5' AUCGAUCGAUCGAUCGAUCG AUCG AUCG 3' ?

(1) 3' UAGCUAGCUAGCUAGCUA

GCUAGCUAGC 5'

(2) 5' ATCGATCGATCGATCGATCG

ATCGATCG 3'

(3) 3' ATCGATCGATCGATCGATCG

ATCGATCG 5'

(4) 5' UAGCUAGCUAGCUAGCUA

GCUAGC UAGC 3'

Ans. (2)

Sol. Coding strand have same sequence as of mRNA but at the place of U, T is found in coding strand.

194. Which of the following is characteristic feature of cockroach regarding sexual dimorphism ?

(1) Presence of anal styles

(2) Presence of sclerites

(3) Presence of anal cerci

(4) Dark brown body colour and anal cerci

Ans. (1)

Sol. male cockroach bear a pair of short, thread like anal-style which are absent in female.

195. Which of the following statements are correct regarding skeletal muscle ?

A. Muscle bundles are held together by collagenous connective tissue layer called fascicle.

B. Sarcoplasmic reticulum of muscle fibre is a store house of calcium ions.

C. Striated appearance of skeletal muscle fibre is due to distribution pattern of actin and myosin proteins.

D. M line is considered as functional unit of contraction called sarcomere.

Choose the **most appropriate** answer from the options giveb below.

(1) B and C only

(2) A, C and D only

(3) C and D only

(4) A, B and C only

Ans. (1)

Sol. A. Muscle bundles are held together by collagenous connective tissue layer called fascia.

B. Sarcoplasmic reticulum of muscle fibre is a store house of calcium ions.

C. Striated appearance of skeletal muscle fibre is due to distribution pattern of actin and myosin proteins.

D. Z-line is considered as functional unit of sarcomere

196. The unique mammalian characteristics are :

(1) hairs, pinna and mammary glands

(2) hairs, pinna and indirect development

(3) pinna, monocondylic skull and mammary glands

(4) hairs, tympanic membrane and mammary glands

Ans. (1)

Sol. The unique mammalian characteristic is the presence of mammary gland, hair and external ear or pinnae.

197. Which one of the following is NOT an advantage of inbreeding ?

(1) It exposes harmful recessive genes that are eliminated by selection.

(2) Elimination of less desirable genes and accumulation of superior genes takes place due to it.

(3) It decreases the productivity of inbred population, after continuous inbreeding.

(4) It decreases homozygosity.

Ans. (3)

Sol. Decrease the productivity of inbreeding is not an advantage character.

198. The parts of human brain that helps in regulation of sexual behaviour, expression of excitement, pleasure, rage, fear etc. are :

(1) Corpora quadrigemina & hippocampus

(2) Brain stem & epithalamus

(3) Corpus callosum and thalamus

(4) Limbic system & hypothalamus

Ans. (4)

Sol. Limbic-system along with hypothalamus involved in regulation of sexual-behaviour, expression of excitement, pleasure, rage, fear etc.

199. Which of the following statements are correct ?

A. An excessive loss of body fluid from the body switches off osmoreceptors.

B. ADH facilitates water reabsorption to prevent diuresis.

C. ANF causes vasodilation.

D. ADH causes increase in blood pressure.

E. ADH is responsible for decrease in GFR.

Choose the correct answer from the options given below :

(1) B, C and D only

(2) A, B and E only

(3) C, D and E only

(4) A and B only

Ans. **(1)**

Sol. A. An excessive loss of fluid from the body can activate osmoreceptors which stimulate hypothalamus to release ADH.

B. ADH facilitates water reabsorption to prevent diuresis.

C. ANF causes vasodilation.

D. ADH causes increase in blood pressure.

E. ADH affect the kidney function by constrictory effect on blood vessels which causes increase in blood pressure, hence increase glomerular blood flow and thereby GFR.

200. Which of the following are NOT under the control of thyroid hormone ?

A. Maintenance of water and electrolyte balance

B. Regulation of basal metabolic rate

C. Normal rhythm of sleep-wake cycle

D. Development of immune system

E. Support the process of R.B.Cs formation

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

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

Ans. **(2)**

Sol. A. maintenance of water and electrolyte balance is function of thyroid hormone

B. Regulation of basal metabolic rate is function of thyroid hormone

C. Sleep-wake cycle is maintain by melotonine hormone of pineal gland

D. Thymus plays major role in development of immune-system

E. Thyroid hormone supports the process of R.B.Cs formation