(BOTANY)

SECTION – A

101. Read the statements and select the correct option.

A. Cell wall of collenchyma is thickened due to cellulose and lignin.

B. The phloem parenchyma stores food material and other substances like resins, latex and mucilage.

(1) Both A and B are correct
(2) Only A is correct
(3) Only B is correct
(4) Both A and B are incorrect

102. Phloem fibres is present in –
(1) Secondary phloem
(2) Primary phloem
(3) Protophloem
(4) Both (1) and (2)

103. Shape of phloem parenchyma is –
(1) Spherical (2) Elongated
(3) Oval (4) Polygonal

104. Barrel shape cells are …… in dicot root
(1) Pith (2) Endodermis
(3) Pericycle (4) Cortex

105. All are the roles of parenchyma except
(1) Storage (2) Secretion
(3) Photosynthesis (4) Mechanical

106. Consider the following statements
S-I: Pits are present in vessels and tracheids.
S-II: Pits are absent in fibre.
Answer the following
(1) Only S-I is correct
(2) Only S-II is correct
(3) Both S-I and S-II are correct
(4) Both S-I and S-II are wrong

107. The cells which lie between xylem and phloem in dicot root are
(1) Pith rays
(2) Conjuctive tissue
(3) Interfascicular cambium
(4) Intrafascicular cambium

108. Choose the **correct** statement
(1) Tracheids and vessels are main water transporting elements in flowering plants
(2) Protoxylem elements are not first formed xylem elements
(3) Sclerenchyma is not found in monocots stem
(4) In conjoint type of vascular bundles, the xylem and phloem at different radius

109. Dicot stem and monocot root are similar in
(1) Presence of radial vascular bundle
(2) Absence of hypodermis
(3) Presence of well-developed pith
(4) Absence of endodermis

110. Casparian strips are present in
(1) Pericycle (2) Endodermis
(3) Bulliform cells (4) Epidermis

111. Consider the following statements.
S I: Hypodermis is sclerenchymatous in maize stem.
S II: Unequal size vascular bundle present in maize stem.
Answer the following.
(1) Only S-I is correct
(2) Only S-II is correct
(3) Both S-I and S-II are correct
(4) Both S-I and S-II are wrong

112. Tissues are classified into two main groups, namely, meristematic and permanent tissues based on
(1) Position and location
(2) Function, position and location
(3) Whether the cells being formed are capable of dividing or not
(4) Structure, function, position and location

113. Ground tissue of dicot root have
(1) Pericycle (2) Pith
(3) Cortex (4) All of these

114. Phloem parenchyma present in-
(1) Monocot stem (2) Monocot root
(3) Dicot root (4) Monocot leaf

115. If a transverse section of plant organ shows vascular bundle in ring and endarch
(1) Dicot stem (2) Monocot leaf
(3) Dicot root (4) Monocot stem

116. Grittiness of the guava fruit pulp is due to
(1) Fibres (2) Sclereids
(3) Chlorenchyma (4) Idioblast

117. Consider the following statements.
a. Collenchyma cells can be photosynthetic.
b. In dicot stem, the cells of endodermis are rich in starch grain.
How many is / are **correct**?
(1) Only a (2) Only b
(3) Both correct (4) Both wrong

118. Mark the **incorrectly** matched.
(1) Sclerenchyma – Devoid of protoplast
(2) Lateral meristem – Cork cambium
(3) Pericycle of root – Parenchyma
(4) Sclereids – Present in xylem

119. Which of the following cells have lignin?
(1) Vessels and xylem fibre not phloem fibre
(2) Vessels, tracheids and xylem fibre
(3) Mesophyll cell and xylem parenchyma
(4) All of these

120. Ground tissues in dicot root have –
(1) Parenchyma (2) Collenchyma
(3) Sclerenchyma (4) All of these

121. Stele in dicot root have –
(1) Cortex (2) Endodermis
(3) Pericycle (4) All of these

122. Which of the following is **true** for primary meristem **except**?
(1) Present on shoot tip
(2) Present at intercalary
(3) Undergo differentiation
(4) Undergo redifferentiation

123. Exarch and polyarch vascular bundles occur in
(1) Monocot stem (2) Monocot root
(3) Dicot stem (4) Dicot root

124. The type of tissue commonly found in the fruit wall of nuts is:
(1) Sclereid (2) Parenchyma
(3) Collenchyma (4) Both (1) and (2)

125. Initiation of lateral roots and vascular cambium during secondary growth takes place in cells of:
(1) Pericycle (2) Epiblema
(3) Cortex (4) Endodermis

126. Which tissue provides maximum mechanical strength to the plant?
(1) Parenchyma (2) Xylem
(3) Collenchyma (4) Phloem

127. Tissue forming long conjunctive tissue in root
(1) Sclerenchyma (2) Collenchyma
(3) Xylem (4) Parenchyma

128. Which of the following is incorrect about sclereids?
(1) Present in hypodermis of dicot stem
(2) An individual sclerenchymatous cell
(3) Highly thickened wall
(4) Dead cells

129. Select the incorrect matching:
(1) Protophloem – Narrow sieve tubes
(2) Metaphloem – Bigger sieve tubes
(3) Gymnosperm – Albuminous cells and sieve cells
(4) Gymnosperm – Vessels in xylem

130. A living mechanical tissue having pecto -cellulosic wall thickening is:
(1) Sclerenchyma (2) Collenchyma
(3) Parenchyma (4) Aerenchyma

131. T.S of monocot root is characterised by the presence of
(1) Diarch bundle
(2) Large pith
(3) Many collenchyma
(4) Absence of endodermis

132. The epiblema of roots is equivalent to
(1) Pericycle (2) Endodermis
(3) Epidermis (4) Stele

133. Phloem tissue of angiosperms differs from that of gymnosperms in having –
(1) Companion cells
(2) Sieve cells
(3) Lack Sieve tubes
(4) All of these

134. Companion cells are closely associated with
(1) Sieve elements (2) Vessel elements
(3) Trichomes (4) Guard cells

135. Mark the incorrect.
(1) Apical meristem is primary meristem
(2) Cork cambium is secondary meristem
(3) Dicot root and monocot root is endarch
(4) Epidermis of root is epiblema

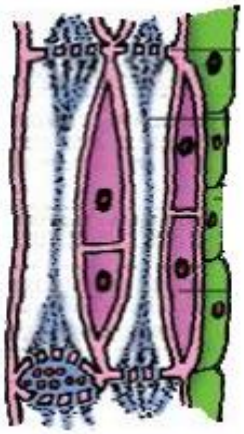
SECTION – B

136. Mark the **correct** statement.
(1) Bulliform cells are green
(2) Bast fibres are sclerenchymatous
(3) Bean shaped guard cell present in grasses
(4) Both (1) and (2)

137. Few features are given.
I. Hypodermal sclerenchymatous
II. Conjoint vascular bundle
III. Unequal size vascular bundle
IV. Parenchymatous endodermis
V. Presence of protoxylem in vascular bundle
How many feature is/are belong to dicot stem?
(1) I, III and V (2) Only V
(3) II, IV and V (4) II and V

138. Which is true for both collenchyma and sclerenchyma
(1) Both are dead
(2) Both photosynthetic
(3) Both can be mechanical
(4) Both lignified

139. Identify the **incorrect** for the following figure



(1) It is complex tissue
(2) Do food translocation
(3) Exact same components of this tissue also found in gymnosperm
(4) Both (1) & (2)

140. Collenchyma cells differ from parenchyma in
(1) Have nucleus
(2) Living cells
(3) Can have mechanical role
(4) Can be photosynthetic

141. Root hairs are
(1) Acellular
(2) Unicellular
(3) Multicellular
(4) Multicellular and unicellular

142. Consider the following statements.
A. Tracheids have elongated shape and tapering ends
B. Vessels have lignin deposition
C. Protophloem lack phloem fibre
Which statement(s) is/are **correct**?
(1) Only A
(2) Only Both A and C
(3) Only Both A and B
(4) All three are correct

143. Which of the following is incorrect about isobilateral leaf?
(1) Stomata is present on both surfaces
(2) Undifferentiated mesophyll
(3) Nearly the same size of vascular bundle is present all over leaf
(4) It is a monocot leaf

144. **Assertion:** Trichomes helps in preventing water loss due to transpiration.
Reason: On the root, the epidermal hairs are called trichomes
(1) Both Assertion & Reason are true and the reason is the correct explanation of the assertion.
(2) Both Assertion & Reason are true but the reason is not the correct explanation of the assertion.
(3) Assertion is true statement but Reason is false.
(4) Both Assertion and Reason are false statements

145. Generally, hypodermis in dicot stem is composed of
(1) Parenchyma (2) Sclerenchyma
(3) Collenchyma (4) Chlorenchyma

146. **Assertion:** Cuticle prevent loss of water from epidermis
Reason: Cuticle is made up of waxy thick layer and cover epidermis
(1) Both Assertion & Reason are true and the reason is the correct explanation of the assertion.
(2) Both Assertion & Reason are true but the reason is not the correct explanation of the assertion.
(3) Assertion is true statement but Reason is false.
(4) Both Assertion and Reason are false statements

147. Match the followings and choose the **correct** option from below

Column I	**Column II**
(a) Cuticle	(i) Guard cells
(b) Bulliform cells	(ii) Single layer
(c) Stomata	(iii) Waxy layer
(d) Epidermis	(iv) Empty colourless cell

Options:
(1) (a)–(iii), (b)–(iv), (c)–(i), (d)–(ii)
(2) (a)–(i), (b)–(ii), (c)–(iii), (d)–(iv)
(3) (a)–(iii), (b)–(ii), (c)–(iv), (d)–(i)
(4) (a)–(iii), (b)–(ii), (c)–(i), (d)–(iv).

148. Stomatal apparatus consists of
(1) Subsidiary cells
(2) Guard cells
(3) Stomatal aperture
(4) All of the above

149. Conjoint vascular bundle is present in
(1) Monocot stem (2) Dicot stem
(3) Leaf (4) All of these

150. Which of the following is **correct** about dorsiventral leaf?
(1) The veins vary in thickness in the reticulate venation.
(2) Palisade parenchyma is abaxially placed.
(3) Abaxial surface bears no stomata.
(4) The size of vascular bundles are independent on the size of veins

(ZOOLOGY)

SECTION-A

151. The most toxic N_2 waste is _x_ and is excreted by _y_ :

(1) x = Urea y = Mammals
(2) x = Uric acid y = Birds
(3) x = Ammonia y = Bony fishes
(4) x = Urea y = Reptiles

152. Kidneys are reddish brown, bean shaped structures situated between the levels of –

(1) Last thoracic and fifth lumbar vertebra.
(2) Tenth thoracic and third lumbar vertebra.
(3) Last thoracic and third lumbar vertebra.
(4) Last thoracic and fourth lumbar vertebra.

153. Both human kidneys contains _x_ nephrons and has a length of _y_ :

(1) x = 2 million y = 10 – 12 cm
(2) x = 4 million y = 2 – 3 cm
(3) x = 1 million y = 10 – 12 cm
(4) x = 4 million y = 10 – 12 cm

154. Protonephridia or flame cells are the excretory structures found in:

(1) Platyhelminthes (2) Sponges
(3) Mollusca (4) Mammals

155. The first step in urine formation is the filtration of blood, which is carried out by the glomerulus. On an average _(a)_ of blood is filtered by the kidneys per minute which constitutes roughly _(b)_ of the blood pumped out by each ventricle of the heart in a minute.

Choose the option which fills the blank correctly.

	(a)	(b)
(1)	1000 – 150 ml	1/2
(2)	1200 – 1500 ml	1/3rd
(3)	1100 – 1200 ml	1/5th
(4)	1000 – 2000 ml	2/3rd

156. Given below are two statements. One is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A): Left ventricle pumps blood at a very high pressure to all body parts involved in systemic circulation.

Reason (R): The muscular wall of the left ventricle is 2-3 times as thick as compared to that of right ventricle.

In the light of the above statements, choose the correct answer from the options 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).

157. For juxta medullary nephrons, which is correct statement?

(1) More in number w.r.t. cortical nephrons.
(2) Contains shorter loop of Henle.
(3) Contain vasa recta capillaries.
(4) Are completely found in medulla.

158. A person with AB blood group wants to donate blood. He can donate blood to a person with:

(1) A blood group only
(2) B blood group only
(3) A and O blood group
(4) Only AB blood group

159. The sequential event in the heart which is cyclically repeated is called the cardiac cycle. The duration of a cardiac cycle is:

(1) 0.6 seconds (2) 60 seconds
(3) 0.8 seconds (4) 10 seconds

160. Simple cuboidal brush bordered epithelium which increases the surface area for reabsorption is found in:

(1) Bowman's capsule
(2) PCT
(3) Fallopian tube
(4) Blood capillaries

161. Podocytes are found in:

(1) Afferent arteriole
(2) Efferent arteriole
(3) Bowman's capsule
(4) Convoluted tubule

162. Deposition of fats, cholesterol and calcium in coronary arteries making the lumen narrower is referred as:

(1) Cardiac arrest (2) Atherosclerosis
(3) Angina (4) High blood pressure

163. On an average, how much urea is excreted per day by an adult human?

(1) 10 – 15 gm (2) 20 – 25 gm
(3) 40 – 45 gm (4) 25 – 30 gm

164. The first heart sound 'lub' and second heart sound 'dub' are produced due to:

(1) Opening of AV valves.
(2) Opening of semilunar valves.
(3) Closure of AV valves and semilunar valves.
(4) Opening of AV and closure of semilunar valves.

165. Match the column I (Part of nephrons) with column II (their functions) and choose the correct options.

	Column I (Part of nephrons)		Column II (Their functions)
A.	PCT	I.	allows transport of electrolytes actively or passively.
B.	Ascending limb of loop of Henle	II.	Reabsorption of 70 – 80% of electrolytes and water along with all nutrients.
C.	Descending limb of loop of Henle	III.	Conditional reabsorption of water and Na^+.
D.	Late DCT and collecting duct	IV.	Allows reabsorption of water only.

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

166. Glomerular filtration rate (GFR) in a healthy individual is:
(1) 25 ml/minute
(2) 250 ml/minute
(3) 125 ml/minute
(4) 150 ml/minute

167. Sebaceous glands eliminate certain substances through sebum. This includes:
(1) NaCl and small amount of urea.
(2) Cholesterol and degraded steroid hormones.
(3) Sterols, hydrocarbons and waxes.
(4) Biliverdin and Bilirubin.

168. In diabetes insipidus, which factor is not produced?
(1) ADH
(2) ANF
(2) Renin
(4) Rennin

169. A minute vessel of fine capillary network runs parallel to the Henle's loop forming a 'U' shaped structure called:
(1) Peritubular capillary network
(2) Vasa recta
(3) Loop of Henle
(4) Collecting duct

170. In case of low blood volume, low glomerular blood pressure and low GFR which is not produced?
(1) Renin
(2) ANF
(3) Angiotensin II
(4) Aldosterone

171. Glucose and amino acids in the filtrate are mainly reabsorbed in
(1) DCT
(2) Loop of Henle
(3) PCT
(4) Collecting duct

172. Given below are two statements. One is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A): A man caught in middle of a hot desert without H_2O, excretes very less and concentrated urine.
Reason (R): Hypothalamus and posterior pituitary stops secretion of ADH in such above situation.
In the light of the above statements, choose the correct answer from the options 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).

173. Select the correct match of blood cells and their percentage in blood.
(1) Neutrophils – 2 – 3%
(2) Monocytes – 60 – 65%
(3) Basophils – 0.5 – 1%
(4) Lymphocytes – 6 – 8%

174. Malpighian body or renal corpuscle includes:
(1) Glomerulus with afferent arteriole
(2) Glomerulus along with Bowman's capsule.
(3) Bowman's capsule with PCT.
(4) Glomerulus with efferent arteriole.

175. Read the following statements A and B:
Statement A: Mother Rh -ve and Foetus Rh -ve can lead to Rh incompatibility.
Statement B: Amphibians have three chambered heart with incomplete double circulation.
In the light of the above statements, choose the most appropriate answer from the options given below:

(1) Both statements are correct.
(2) Both statements are incorrect.
(3) Only statement B is correct.
(4) Only statement A is correct.

176. Presence of glucose and ketone bodies in urine are indicative of –
(1) Renal failure
(2) Glomerulonephritis
(3) Uremia
(4) Diabetes mellitus

177. Which is incorrect match?

(1) Atrial systole – 0.1 sec
(2) Ventricular systole – 0.3 sec
(3) Ventricular diastole – 0.5 sec
(4) Joint Diastole – 0.5 sec

178. Read the following statements A and B:

Statement A: Removal of PCT will cause formation of very dilute urine.

Statement B: Removal of stretch receptors will stop micturition.

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

(1) Both statements are correct.
(2) Both statements are incorrect.
(3) Only statement B is correct.
(4) Only statement A is correct.

179. The animals which excrete nitrogenous wastes as uric acid in the form of pellet or paste are:

(1) Aquatic amphibians
(2) Mammals
(3) Birds
(4) Aquatic insects

180. Which is a vasodilator in the following?

(1) ADH (2) Angiotensin II
(3) ANF (4) Heparin

181. Read the given statements w.r.t. blood plasma.

(a) 90–92 percent of plasma is water.
(b) Plasma is a straw coloured, viscous fluid constituting nearly 55 percent of the blood.
(c) Plasma contains small amounts of minerals like Na^+, Ca^{++}, Mg^{++}, HCO_3^-, Cl^- etc.
(d) Plasma with clotting factors is called serum.

How many of the given statements are correct?

(1) One
(2) Two
(3) Three
(4) Four

182. Which blood protein is primarily involved in defense mechanisms of the body?

(1) Fibrinogen
(2) Albumins
(3) Heparin
(4) Globulins

183. H^+ ions are secreted into the filtrate at:

(1) Duct of Bellini
(2) Ascending limb of loop of Henle
(3) Descending limb of loop of Henle
(4) PCT

184. A symptom of acute chest pain is called:

(1) Heart attack
(2) Angina
(3) Fossa ovalis
(4) Heart failure

185. Other than kidneys, which organ help in the elimination of excretory wastes?

(1) Lungs
(2) Liver
(3) Skin
(4) All of the above

SECTION – B

186. Given below are two statements. One is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A): Human heart is called myogenic.

Reason (R): Normal activities of heart are regulated intrinsically i.e. autoregulated by specialised muscles.

In the light of the above statements, choose the correct 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)

187. Match the column I and column II and choose the correct option.

	Column-I		Column-II
A.	Erythrocytes	I.	Involved in inflammatory reactions.
B.	Basophils	II.	Involved in blood clotting.
C.	Monocytes	III.	Transport of respiratory gases.
D.	Thrombocytes	IV.	Phagocytic cells.

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

188. Opening between right atrium and right ventricle is guarded by –

(1) Bicuspid valve (2) Tricuspid valve
(3) Semilunar valve (4) Mitral valve

189. In an ECG, P wave represents:

(1) Depolarisation of the atria.
(2) Repolarisation of the atria.
(3) Depolarisation of the ventricle.
(4) Repolarisation of the ventricle.

190. Rate of heart beat is determined by –
(1) Purkinje fibres
(2) Papillary muscles
(3) Bundle of His
(4) SA node

191. Which of the following is a powerful vasoconstrictor?
(1) Renin
(2) Angiotensinogen
(3) Angiotensin II
(4) ANF

192. JGA is a special sensitive region formed by the cellular modification in:
(1) PCT and DCT
(2) DCT and afferent arteriole
(3) PCT and afferent arteriole
(4) Glomerulus and PCT

193. A healthy individual has _____ of haemoglobin in every 100 ml of blood.
(1) 2 – 8 gms (2) 12 – 16 gms
(3) 5 – 10 gms (4) 20 – 25 gms

194. Inside the kidneys, the medulla is divided into a few conical masses called:
(1) Hilum
(2) Renal pelvis
(3) Calyces
(4) Medullary pyramids

195. Human kidneys can produce urine nearly _____ concentrated than the initial filtrate formed.
(1) Five times (2) Ten times
(3) Four times (4) Two times

196. Sweat contains all of the following except:
(1) NaCl (2) H_2O
(3) Cholesterol (4) Urea

197. Dialysing fluid have the same composition as that of plasma except the –
(1) Minerals (2) Nitrogenous wastes
(3) Water (4) Proteins

198. The parts of nephron situated in medullary pyramid of kidney are:
(1) PCT
(2) Loop of Henle
(3) Malpighian corpuscle
(4) DCT

199. Which of the following is the ultimate method of the correction of renal failure?
(1) Kidney transplant
(2) Artificial kidney
(3) Kidney removal
(4) Medicines

200. In insects, the removal of nitrogenous wastes and osmoregulation occurs by –
(1) Kidneys
(2) Flame cells
(3) Malpighian tubules
(4) Nephridia

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103. (2)

Shape of phloem parenchyma is elongated.

CLASS 11 NCERT PG NO.88

104. (2)

The innermost layer of the cortex is called endodermis.

It comprises a single layer of barrel-shaped cells without any intercellular spaces.

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105. (4)

* Collenchyma and sclerenchyma provide mechanical support. Sclerenchyma provides mechanical support to organs. Collenchyma provide mechanical support to the growing parts of the plant such as young stem and petiole of a leaf

CLASS 11 NCERT PG NO.86

106. (1)

Pith are present in fibres.86

CLASS 11 NCERT PG NO

Solution

In conjoint type of vascular bundles, the xylem and phloem at same radius.

CLASS 11 NCERT PG NO.88,90

109. (3)

Presence of well-developed pith.

CLASS 11 NCERT PG NO.91

110. (2)

The tangential as well as radial walls of the endodermal cells have a deposition of water-impermeable, waxy material suberin in the form of casparian strip.

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111. (3)

Both S-I and S-II are correct.

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112. (3)

Tissues are classified into two main groups, namely, meristematic and permanent tissues based on whether the cells being formed are capable of dividing or not.

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113. (4)
All of these.
All tissues except epidermis and vascular bundles constitute the ground tissue
CLASS 11 NCERT PG NO.89

114. (3)
Phloem parenchyma is absent in most of the monocotyledons
CLASS 11 NCERT PG NO.88

115. (1)
Dicot stem.
CLASS 11 NCERT PG NO.92

116. (2)
Grittiness is due to sclereids.
CLASS 11 NCERT PG NO.87

117. (3)
* Collenchyma cells assimilate food when they contain chloroplasts. So, collenchyma cells can be photosynthetic
* The cells of the endodermis are rich in starch grains and the layer is also referred to as the starch sheath.

CLASS 11 NCERT PG NO.86

118. (4)
The sclereids are spherical, oval or cylindrical, highly thickened dead cells with very narrow cavities (lumen). These are commonly found in the fruit walls of nuts; pulp of fruits like guava, pear and sapota; seed coats of legumes and leaves of tea
CLASS 11 NCERT PG NO.87

119. (2)
Vessels, tracheids and xylem fibre, phloem fibre have lignin
CLASS 11 NCERT PG NO.87

120. (1)
Parenchyma
CLASS 11 NCERT PG NO.86

121. (3)
Stele- central conducting part
* It is all tissue inner to endodermis

CLASS 11 NCERT PG NO.91

122. (4)
Primary meristem do not undergo redifferentiation
CLASS 11 NCERT PG NO.85

123. (2)
Monocot root.
CLASS 11 NCERT PG NO.91

124. (1)
The type of tissue commonly found in the fruit wall of nuts is sclereid
CLASS 11 NCERT PG NO.87

125. (1)
Initiation of lateral roots and vascular cambium during secondary growth takes place in cells of pericycle
CLASS 11 NCERT PG NO.91

126. (2)
Xylem provides maximum mechanical strength to the plant
CLASS 11 NCERT PG NO.87

127. (4)
The parenchymatous cells which lie between the xylem and the phloem are called conjunctive tissue
CLASS 11 NCERT PG NO.91

128. (1)
Collenchyma present in hypodermis of dicot stem
CLASS 11 NCERT PG NO.92

129. (4)
Gymnosperm – Lack vessels in their xylem
CLASS 11 NCERT PG NO.87

130. (2)
Collenchyma cells which are much thickened at the corners due to a deposition of cellulose, hemicelluloses and pectin
CLASS 11 NCERT PG NO.86

131. (2)
Pith is large and well developed
CLASS 11 NCERT PG NO.91

132. (3)
In roots, the outermost layer is epiblema.
CLASS 11 NCERT PG NO.90

133. (1)
* Angiosperms have companion cells, sieve tube elements.
* Gymnosperms have albuminous cells and sieve cells. They lack companion cells, sieve tube elements.

CLASS 11 NCERT PG NO.87

134. (1)
Companion cells are closely associated with sieve elements.
Class 11th NCERT Pg.88

135. (3)
Dicot root and monocot root is exarch
CLASS 11 NCERT PG NO.87

136. (2)
Bean shaped guard cell present in dicot
CLASS 11 NCERT PG NO.89

137. (3)
In dicot stem:
* Hypodermal collenchyma.
* Conjoint vascular bundle.
* Equal size vascular bundle.
* Parenchymatous endodermis.
* Presence of protoxylem in vascular bundle.

CLASS 11 NCERT PG NO.92,93

138. (3)
Both can be mechanical
CLASS 11 NCERT PG NO.86

139. (3)
The given diagram is of phloem of angiosperm plants.
* Phloem transports food materials, usually from leaves to other parts of the plant.
* Phloem in angiosperms is composed of sieve tube elements, companion cells, phloem parenchyma and phloem fibres
* Gymnosperms have albuminous cells and sieve cells.
* They lack sieve tubes and companion cells.

CLASS 11 NCERT PG NO. 87

140. (3)
Collenchyma cells have mechanical role.
CLASS 11 NCERT PG NO.86

141. (2)
The root hairs are unicellular elongations of the epidermal cells and help absorb water and minerals from the soil.
CLASS 11 NCERT PG NO.89

142. (4)
All three are correct.
CLASS 11 NCERT PG NO.87

143. (3)
The parallel venation in monocot leaves is reflected in the near similar sizes of vascular bundles (except in main veins) as seen in vertical sections of the leaves
CLASS 11 NCERT PG NO.94

144. (3)
* On the stem the epidermal hairs are called trichomes.
* The trichomes help in preventing water loss due to transpiration.

CLASS 11 NCERT PG NO.89

145. (3)
Generally hypodermis in dicot stem is composed of collenchyma.
CLASS 11 NCERT PG NO.93

146. (1)
The outside of the epidermis is often covered with a waxy thick layer called the cuticle which prevents the loss of water.
CLASS 11 NCERT PG NO.93

147. (1)
* Cuticle – Waxy layer
* Bulliform cells – Empty colourless cell
* Stomata – Guard cells
* Epidermis – Single layer

CLASS 11 NCERT PG NO ,89,88,94

148. (4)
The stomatal aperture, guard cells and the surrounding subsidiary cells are together called stomatal apparatus.
CLASS 11 NCERT PG NO.89

149. (4)
In conjoint type of vascular bundles, the xylem and phloem are jointly situated along the same radius of vascular bundles. Such vascular bundles are common in stems and leaves
CLASS 11 NCERT PG NO.90

150. (1)
* The size of the vascular bundles are dependent on the size of the veins
* Palisade parenchyma are adaxially placed
* The abaxial epidermis generally bears more stomata than the adaxial epidermis

CLASS 11 NCERT PG NO.93

151. (3)

NCERT XIth, Page 290

Ammonia is the most toxic form and requires large amount of water for its elimination, whereas uric acid, being the least toxic, can be removed with a minimum loss of water.

152. (3)

NCERT XIth, Page 291

Kidneys are reddish brown, bean shaped structures situated between the levels of last thoracic and third lumbar vertebra close to the dorsal inner wall of the abdominal cavity.

153. (1)

NCERT XIth, Page 292

Each kidney has nearly one million complex tubular structures called nephrons, which are the functional units. Each nephron has two parts - the glomerulus and the renal tubule.

154. (1)

NCERT XIth, Page 291

Protonephridia or flame cells are the excretory structures in Platyhelminthes (Flatworms, e.g., *Planaria*), rotifers, some annelids and the cephalochordate – *Amphioxus*. Protonephridia are primarily concerned with ionic and fluid volume regulation, i.e., osmoregulation.

155. (3)

NCERT XIth, Page 293

The first step in urine formation is the filtration of blood, which is carried out by the glomerulus and is called glomerular filtration. On an average, 1100–1200 ml of blood is filtered by the kidneys per minute which constitute roughly 1/5th of the blood pumped out by each ventricle of the heart in a minute.

156. (1)

NCERT XIth, Page 286

The oxygenated blood entering the aorta is carried by a network of arteries, arterioles and capillaries to the tissues from where the deoxygenated blood is collected by a system of venules veins and vena cava and emptied into the right atrium.

157. (3)

NCERT XIth, Page 293

In majority of nephrons, the loop of Henle is too short and extends only very little into the medulla. Such nephrons are called cortical nephrons. In some of the nephrons, the loop of Henle is very long and runs deep into the medulla. These nephrons are called juxta medullary nephrons.

158. (4)

NCERT XIth, Page 280, Table 18.1

As the person having AB blood group has both A and B antigens on their RBCs so they can only donate blood to the person having AB blood group.

159. (3)

NCERT XIth, Page 285

The sequential event in the heart which is cyclically repeated is called the cardiac cycle and it consists of systole and diastole of both the atria and ventricles. As mentioned earlier, the heart beats 72 times per minute, i.e., that many cardiac cycles are performed per minute. From this it could be deduced that the duration of a cardiac cycle is 0.8 seconds.

160. (2)

NCERT XIth, Page 294

PCT is lined by simple cuboidal brush border epithelium which increases the surface area for reabsorption. Nearly all of the essential nutrients, and 70–80 percent of electrolytes and water reabsorbed by this segment.

161. (3)

NCERT XIth, Page 293

The epithelial cells of Bowman's capsule called podocytes are arranged in an intricate manner so as to leave some minute spaces called filtration slits or slit pores. Blood is filtered so finely through these membranes, that almost all the constituents of the plasma except the proteins pass into the lumen of the Bowman's capsule.

162. (2)

NCERT XIth, Page 288

Coronary Artery Disease, often referred to as atherosclerosis, affects the vessels that supply blood to the heart muscles. It is caused by deposits of calcium, fat, cholesterol and fibrous tissues, which makes the lumen of arteries narrower.

163. (4)

NCERT XIth, Page 298

On an average, 25–30 gm of urea is excreted out per day.

164. (3)

NCERT XIth, Page 285

During each cardiac cycle two prominent sounds are produced which can be easily heard through a stethoscope. The first heart sound (lub) is associated with the closure of the tricuspid and bicuspid valves whereas the second heart sound (dub) is associated with the closure of the semilunar valves. These sounds are of clinical diagnostic significance.

165. (4)

NCERT XIth, Page 294, 295

- Proximal Convoluted Tubule: Nearly all of the essential nutrients, and 70-80 per cent of electrolytes and water are reabsorbed by this segment.
- LH: The descending limb of loop of Henle is permeable to water but almost impermeable to electrolytes. This concentrates the filtrate as it moves down. The ascending limb is impermeable to water but allows transport of electrolytes actively or passively.

166. (3)

NCERT XIth, Page 294

The amount of the filtrate formed by the kidneys per minute is called glomerular filtration rate (GFR). GFR in a healthy individual is approximately 125 ml/minute, i.e., 180 litres per day.

167. (3)

NCERT XIth, Page 298

Sebaceous glands eliminate certain substances like sterols, hydrocarbons and waxes through sebum. This secretion provides a protective oily covering for the skin.

168. (1)

NCERT XIth, Page 297

ADH facilitates water reabsorption from latter parts of the tubule, thereby preventing diuresis. ADH can also affect the kidney function by its constrictory effects on blood vessels. This causes an increase in blood pressure. ADH deficiency leads to diabetes insipidus.

169. (2)

NCERT XIth, Page 293

The efferent arteriole emerging from the glomerulus forms a fine capillary network around the renal tubule called the peritubular capillaries. A minute vessel of this network runs parallel to the Henle's loop forming a 'U' shaped *vasa recta*.

170. (2)

NCERT XIth, Page 297

The JGA plays a complex regulatory role. A fall in glomerular blood flow/glomerular blood pressure/GFR can activate the JG cells to release renin which converts angiotensinogen in blood to angiotensin I and further to angiotensin II. Angiotensin II, being a powerful vasoconstrictor, increases the glomerular blood pressure and thereby GFR. Angiotensin II also activates the adrenal cortex to release aldosterone. Aldosterone causes reabsorption of Na^+ and water from the distal parts of the tubule. This also leads to an increase in blood pressure and GFR. This complex mechanism is generally known as the Renin-Angiotensin mechanism.

- An increase in blood flow to the atria of the heart can cause the release of Atrial Natriuretic Factor (ANF).

171. (3)

NCERT XIth, Page 294

Nearly all of the essential nutrients, and 70-80 per cent of electrolytes and water are reabsorbed by the PCT region.

172. (2)

NCERT XIth, Page 297

Osmoreceptors in the body are activated by changes in blood volume, body fluid volume and ionic concentraton. An excessive loss of fluid from the body can activate these receptors which stimulate the hypothalamus to release antidiuretic hormone (ADH) or vasopressin from the neurohypophysis. ADH facilitates water reabsorption from latter parts of the tubule, thereby preventing diuresis. An increase in body fluid volume can switch off the osmoreceptors and suppress the ADH release to complete the feedback.

173. (3)

NCERT XIth, Page 279, 280

Neutrophils	–	60 – 65%
Monocytes	–	6 – 8%
Basophils	–	0.5 – 1%
Lymphocytes	–	20 – 25%

174. (2)

NCERT XIth, Page 292

The renal tubule begins with a double walled cup-like structure called Bowman's capsule, which encloses the glomerulus. Glomerulus alongwith Bowman's capsule, is called the malpighian body or renal corpuscle.

175. (3)

NCERT XIth, Page 281, 282

- A special case of Rh incompatibility (mismatching) has been observed between the Rh–ve blood of pregnant mother Rh+ve blood of the foetus.
- Amphibians and the reptiles (except crocodiles) have a 3-chambered heart with two atria and a single ventricle.

176. (4)

NCERT IXth, Page 298

Presence of glucose (Glycosuria) and ketone bodies (Ketonuria) in urine are indicative of diabetes mellitus.

177. (4)

NCERT IXth, Page 285

The cardiac cycle consists of one heart beat or one cycle of contraction and relaxation of the cardiac muscle.

Atrial systole (AS) - 0.1 sec.

Ventricular systole (VS) - 0.3 sec.

Joint diastole (JS) - 0.4 sec.

Ventricular diastole - 0.5 sec.

178. (1)

NCERT IXth, Page 297, 298

- As around 70 – 80% of electrolytes and water are reabsorbed in PCT, so if PCT is removed then their will be no reabsorption of water so urine will be diluted.
- Urine formed by the nephrons is ultimately carried to the urinary bladder where it is stored till a voluntary signal is given by the central nervous system (CNS). This signal is initiated by the stretching of the urinary bladder as it gets filled with urine. In response, the stretch receptors on the walls of the bladder send signals to the CNS. The CNS passes on motor messages to initiate the contraction of smooth muscles of the bladder and simultaneous relaxation of the urethral sphincter causing the release of urine. The process of release of urine is called micturition and the neural mechanisms causing it is called the micturition reflex.

179. (3)

NCERT IXth, Page 290

Reptiles, birds, land snails and insects excrete nitrogenous wastes as uric acid in the form of pellet or paste with a minimum loss of water and are called uricotelic animals.

180. (3)

NCERT IXth, Page 297

An increase in blood flow to the atria of the heart can cause the release of Atrial Natriuretic Factor (ANF). ANF can cause vasodilation (dilation of blood vessels) and thereby decrease the blood pressure. ANF mechanism, therefore, acts as a check on the renin-angiotensin mechanism.

181. (3)

NCERT IXth, Page 278

Plasma is a straw coloured, viscous fluid constituting nearly 55 per cent of the blood. 90-92 per cent of plasma is water and proteins contribute 6-8 per cent of it. Fibrinogen, globulins and albumins are the major proteins. Plasma without clotting factors is called serum.

182. (4)

NCERT IXth, Page 279

Globulins primarily are involved in defense mechanisms of the body.

183. (4)

NCERT IXth, Page 294

PCT also helps to maintain the pH and ionic balance of the body fluids by selective secretion of hydrogen ions, ammonia and potassium ions into the filtrate and by absorption of HCO_3^- from it.

184. (2)

NCERT IXth, Page 288

- **Angina:** It is also called 'angina pectoris'. A symptom of acute chest pain appears when no enough oxygen is reaching the heart muscle. Angina can occur in men and women of any age but it is more common among the middle-aged and elderly. It occurs due to conditions that affect the blood flow.
- Heart failure means the state of heart when it is not pumping blood effectively enough to meet the needs of the body.
- Heart attack is when the heart muscle is suddenly damaged by an inadequate blood supply.

185. (4)

NCERT IXth, Page 298

- Other than the kidneys, lungs, liver and skin also help in the elimination of excretory wastes.
- Our lungs remove large amounts of CO_2 (approximately 200mL/minute) and also significant quantities of water every day. Liver, the largest gland in our body, secretes bile-

containing substances like bilirubin, biliverdin, cholesterol, degraded steroid hormones, vitamins and drugs. Most of these substances ultimately pass out alongwith digestive wastes.

- The sweat and sebaceous glands in the skin can eliminate certain substances through their secretions.

186. (4)

NCERT IXth, Page 287

Normal activities of the heart are regulated intrinsically, i.e., auto regulated by specialised muscles (nodal tissue), hence the heart is called myogenic.

187. (2)

NCERT IXth, Page 279, 280

- Erythrocytes - Transport of respiratory gases.
- Basophils - Involved in inflammatory reactions.
- Monocytes - Phagocytic cells.
- Thrombocytes - Involved in blood clotting

188. (2)

NCERT IXth, Page 283

The opening between the right atrium and the right ventricle is guarded by a valve formed of three muscular flaps or cusps, the tricuspid valve, whereas a bicuspid or mitral valve guards the opening between the left atrium and the left ventricle.

189. (1)

NCERT IXth, Page 286

The P-wave represents the electrical excitation (or depolarisation) of the atria, which leads to the contraction of both the atria.

190. (4)

NCERT IXth, Page 284

The nodal musculature has the ability to generate action potentials without any external stimuli, i.e., it is autoexcitable. However, the number of action potentials that could be generated in a minute vary at different parts of the nodal system. The SAN can generate the maximum number of action potentials, i.e., 70–75 min^{-1}, and is responsible for initiating and maintaining the rhythmic contractile activity of the heart. Therefore, it is called the pacemaker. Our heart normally beats 70-75 times in a minute.

191. (3)

NCERT IXth, Page 297

The JGA plays a complex regulatory role. A fall in glomerular blood flow/glomerular blood pressure/GFR can activate the JG cells to release renin which converts angiotensinogen in blood to angiotensin I and further to angiotensin II. Angiotensin II, being a powerful vasoconstrictor, increases the glomerular blood pressure and thereby GFR.

192. (2)

NCERT IXth, Page 294

JGA is a special sensitive region formed by cellular modifications in the distal convoluted tubule and the afferent arteriole at the location of their contact. A fall in GFR can activate the JG cells to release renin which can stimulate the glomerular blood flow and thereby the GFR back to normal.

193. (2)

NCERT IXth, Page 279

A healthy individual has 12–16 gms of haemoglobin in every 100 ml of blood.

194. (4)

NCERT IXth, Page 291

Inside the kidney, there are two zones, an outer cortex and an inner medulla. The medulla is divided into a few conical masses (medullary pyramids) projecting into the calyces (sing.: calyx).

195. (3)

NCERT IXth, Page 297

Human kidneys can produce urine nearly four times concentrated than the initial filtrate formed.

196. (3)

NCERT IXth, Page 298

Sweat produced by the sweat glands is a watery fluid containing NaCl, small amounts of urea, lactic acid, etc. Though the primary function of sweat is to facilitate a cooling effect on the body surface, it also helps in the removal of some of the wastes mentioned above.

197. (2)

NCERT IXth, Page 298, 299

Malfunctioning of kidneys can lead to accumulation of urea in blood, a condition called uremia, which is highly harmful and may lead to kidney failure. In such patients, urea can be removed by a process called hemodialysis. Blood drained from a convenient artery is pumped into a dialysing unit after adding an anticoagulant like heparin. The unit contains a coiled cellophane tube surrounded by a fluid (dialysing fluid) having the same composition as

that of plasma except the nitrogenous wastes. The porous cellophane membrane of the tube allows the passage of molecules based on concentration gradient. As nitrogenous wastes are absent in the dialysing fluid, these substances freely move out, thereby clearing the blood. The cleared blood is pumped back to the body through a vein after adding anti-heparin to it.

198. (2)

NCERT IXth, Page 293

The Malpighian corpuscle, PCT and DCT of the nephron are situated in the cortical region of the kidney whereas the loop of Henle dips into the medulla.

199. (1)

NCERT IXth, Page 299

Kidney transplantation is the ultimate method in the correction of acute renal failures (kidney failure). A functioning kidney is used in transplantation from a donor, preferably a close relative, to minimise its chances of rejection by the immune system of the host. Modern clinical procedures have increased the success rate of such a complicated technique.

200. (3)

NCERT IXth, Page 291

Malpighian tubules are the excretory structures of most of the insects including cockroaches. Malpighian tubules help in the removal of nitrogenous wastes and osmoregulation.