If

Column-I		Column-II	
A	Slime layer	**1**	Strong structural support
B	Capsule	**2**	Thick and tough
C	Cell wall	**3**	Loose sheath
D	Cell membrane	**4**	Interacts with the outside world

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

106. Which among the following is regarded as the function of mesosome
(1) Protein formation
(2) Cell wall formation
(3) Respiration
(4) Both 2 and 3

107. Which of the following cell organelles is directly connected to the outer nuclear membrane?
(1) Mitochondria (2) Golgi body
(3) ER (4) Chromatin

108. **Statement 1:** Bacterial cells may be motile or non-motile. If motile, they have thin filamentous extensions from their glycocalyx called flagella.
Statement 2: Bacteria show a range in the number and arrangement of flagella.
(1) Statement 1 is correct only.
(2) Statement 2 is correct only.
(3) Both statements are correct.
(4) Both statements are incorrect.

109. In human beings, the membrane of the erythrocyte has approximately
(1) 50 per cent protein and 42 per cent lipids
(2) 55 per cent protein and 45 per cent lipids
(3) 52 per cent protein and 40 per cent lipids
(4) 42 per cent protein and 50 per cent lipids

110. Plasmid in prokaryotes is nothing but
(1) DNA (2) RNA
(3) Protein (4) Both 1 and 2

111. Select true statements for plasmodesmata.
A. It holds or glues the different neighbouring cell wall together.
B. It connects the cytoplasm of neighbouring cells.
C. It is a layer mainly composed of calcium pectate.
D. The cell wall and middle lamellae may be traversed by plasmodesmata.
(1) A, B and D (2) B and D
(3) C and D (4) A, B and C

112. The quasi-fluid nature of lipid enables lateral movement of ____ within the overall bilayer.
(1) lipids
(2) proteins
(3) carbohydrates
(4) glycolipids

113. Which of the following part provides sticky character to the bacterial cell?
(1) Cell wall
(2) Mesosome
(3) Plasma membrane
(4) Glycocalyx

114. Plant cell has
(1) Cell wall (2) Nucleoid
(3) Centriole (4) Chromatophore

115. Select the correct option from Column-I and Column-II

Column-I		Column-II	
A.	Palade	**I.**	Cell theory
B.	Robert Brown	**II.**	Golgi apparatus
C.	Schwann	**III.**	Ribosome
D.	Camillo	**IV.**	Nucleus

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

116. **Assertion:** The stroma of the chloroplast contains enzymes required for the synthesis of carbohydrates and proteins.
Reason: It also contains small, double stranded circular DNA molecules and ribosomes.
(1) Both Assertion and Reason are true and Reason is correct explanation of Assertion
(2) Both Assertion and Reason are true but Reason is not correct explanation of Assertion.
(3) Assertion is true and Reason is false.
(4) Assertion is false and Reason is true.

117. Which organelle is associated with the synthesis of protein and steroidal hormone?
(1) Endoplasmic reticulum and chloroplast
(2) Chloroplast and lysosomes
(3) Mitochondria and vacuoles
(4) Endoplasmic reticulum

118. Water moves across the membrane by **__P__** while Na^+/K^+ move across plasma membrane by **__Q__**.

	P	**Q**
(1)	passive transport	active transport
(2)	osmosis	active transport
(3)	active transport	passive transport
(4)	active transport	active transport

119. Inclusion bodies in bacterial cells
(1) are membrane bound
(2) lie freely in cytoplasm
(3) contain reserve materials
(4) more than one option is correct

120. Select the correct statements for ER

A. RER is frequently observed in the cells actively involved in protein synthesis.

B. RER is frequently observed in the cells actively involved in secretion.

C. SER are extensive and continuous with the outer membrane of the vacuoles.

(1) A only (2) A and B

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

121. **Statement 1:** Primary wall is capable of growth.

Statement 2: Secondary wall is formed on the outer side of the primary cell wall.

(1) Statement 1 is correct but Statement 2 is in correct.

(2) Statement 2 is correct but Statement 1 is in correct.

(3) Both the statements are correct.

(4) Both the statements are incorrect.

122. Chromatophores

(1) Contain pigments.

(2) Present in cyanobacteria.

(3) They are membranous extensions.

(4) All of the above

123. Materials to be packaged in the form of vesicles from the ER fuse with the ___ of the Golgi apparatus.

(1) Cis face (2) Trans face

(3) Omega face (4) Delta face

124. Select the incorrect statement for a eukaryotic cell?

(A) Golgi contains circular DNA.

(B) This cell has 70S type of ribosome present in the cytoplasm.

(C) Cell wall is made up of peptidoglycans.

(D) Membrane bound organelles are present.

(1) A and B (2) B and C

(3) A, B and C (4) All of these

125. **Statement 1:** Gas vacuoles are found in blue green and purple and green photosynthetic bacteria.

Statement 2: Inclusion bodies include phosphate granules, cyanophycean granules and glycogen granules.

(1) Statement 1 is correct and Statement 2 is in correct.

(2) Statement 2 is correct and Statement 1 is in correct.

(3) Both statements are correct.

(4) Both statements are incorrect.

126. Match the Column-I with Column-II and choose the correct option:

Column-I		Column-II	
A.	*tuberosum*	**I.**	Family
B.	Polymoniales	**II.**	Kingdom
C.	*Solanum*	**III.**	Order
D.	Plantae	**IV.**	Species
E.	Solanaceae	**V.**	Genus

	A	**B**	**C**	**D**	**E**
(1)	IV	III	V	II	I
(2)	V	IV	II	I	III
(3)	IV	V	II	I	III
(4)	V	III	II	I	IV

127. **Assertion:** Consciousness is considered as the defining property of living organisms.

Reason: All organisms from the prokaryotes to the most eukaryotes can sense and respond to environmental stimuli.

(1) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A).

(2) Both Assertion (A) and Reason (R) are true but Reason (R) is not a correct explanation of Assertion (A).

(3) Assertion (A) is true and Reason (R) is false.

(4) Assertion (A) is false and Reason (R) is true.

128. Identify the incorrect statement:

(1) Biological names are generally in Latin and written in italics. They are Latinised or derived from Latin irrespective of their origin.

(2) The first word in a biological name represents the genus while the second component denotes the specific epithet.

(3) Both the words in a biological name, when handwritten, are separately underlined, or printed in italics to indicate their vernacular origin.

(4) The first word denoting the genus starts with a capital letter while the specific epithet starts with a small letter.

129. The scientific term for biological classification categories is the:

(1) Species (2) Taxon

(3) Phylum (4) Domain

130. The Indian Botanical Garden and the National Botanical Research Institute are located respectively at:

(1) Pune and Howrah

(2) Howrah and Lucknow

(3) Darjeeling and Lucknow

(4) Shimla and Dehradun

131. Study the four statements (I-IV) given below and select the two correct ones out of them:

I. Definition of biological species was given by Ernst Mayr.

II. Photoperiod does not affect reproduction in plants.

III. Binomial nomenclature system was given by R.H. Whittaker.

IV. In unicellular organisms, reproduction is synonymous with growth.

The two correct statements are

(1) I and III
(2) I and IV
(3) II and IV
(4) I and II

132. ICBN stands for

(1) Indian Congress of Biological Names
(2) International Code for Botanical Nomenclature
(3) International Code of Biological Names
(4) Indian Code of Botanical Nomenclature

133. **Assertion(A):** Reproduction cannot be an all-inclusive defining characteristic of living organisms.

Reason(R): There are many organisms that do not reproduce (mules, sterile worker bees, infertile human couples, etc.).

(1) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A).
(2) Both Assertion (A) and Reason (R) are true but Reason (R) is not a correct explanation of Assertion (A).
(3) Assertion (A) is true and Reason (R) is false.
(4) Assertion (A) is false and Reason (R) is true.

134. The label of herbarium sheet does not carry information on:

(1) Date of collection
(2) Name of collector
(3) Local names
(4) Height of the plant

135. Growth by cell division occurs in plants and in animals

(1) continuously, only up to a certain age
(2) only up to a certain age, continuously
(3) continuously, continuously
(4) never, continuously

Section B

136. Read the following statements for plasma membrane and mark the correct option as true (T) or false (F)?

(A) It is present in plants and animal cells only.
(B) Proteins are present in it as bilayer.
(C) Lipids may be peripheral or integral in it.
(D) Carbohydrates are found in it.

	A	**B**	**C**	**D**
(1)	T	F	T	F
(2)	T	F	T	T
(3)	F	T	F	F
(4)	F	F	F	T

137. The fluid mosaic model was proposed by -

(1) Singer and Nicolson
(2) Beadle and Tatum
(3) Robertson and Miller
(4) Watson and Crick

138. Which one of the following combinations is mismatched?

(1) Pili- storage
(2) Cell wall–protective, determines shape, prevents from bursting
(3) Flagella, Pili and Fimbriae-surface structures of bacterial cell
(4) Glycocalyx-may be capsule or slime layer

139. How many among the following can be seen in *Amoeba*-

Inclusion bodies, nucleoid, plasma membrane, plasmid, nucleus, cell wall, mesosome

(1) 5 (2) 4
(3) 3 (4) 2

140. Which of the following statements is not correct?

(1) Lysosomes are formed by the process of packaging in the endoplasmic reticulum.
(2) Lysosomes have numerous hydrolytic enzymes.
(3) The hydrolytic enzymes of lysosomes are active under acidic pH.
(4) Lysosomes are membrane-bound structures.

141. Which of the following 'suffixes' used for units of classification in plants indicates a taxonomic category of 'family'?

(1) -ales (2) -onae
(3) -aceae (4) -ae

142. The number of species that are known and described range between:
(1) 1.7-1.8 billion
(2) 1.4-1.7 million
(3) 1.7-2.1 billion
(4) 1.7-1.8 million

143. How many of the following will show the growth or increase in mass?
Mountain, boulders, sand mound, dead organism, plants.
(1) Three (2) Four
(3) One (4) Two

144. The contrasting characteristics generally in a pair used for identification of animals in taxonomic key are referred to as:
(1) Lead (2) Couplet
(3) Doublet (4) Alternate

145. Select the correct sequence for *Homo sapiens*.
(1) *sapiens* → *Homo* → Primata → Chordata → Animalia
(2) *Homo* → *sapiens* → Primata → Animalia → Chordata
(3) *Homo* → *sapiens* → Primata → Chordata → Animalia
(4) *sapiens* → *Homo* → Animalia → Primata → Chordata

146. Which of the following taxonomic categories contains organisms least similar to one another?
(1) Class (2) Genus
(3) Family (4) Species

147. **Assertion**: Animals, mammals, and dogs are all taxa.
Reason: They represent taxa at same levels.
(1) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(2) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
(3) Assertion is true but Reason is false.
(4) Both Assertion and Reason are false.

148. Metabolism refers to
(1) Making of molecules
(2) Breaking of molecules
(3) Catabolism only
(4) Both (1) and (2)

149. Select the correct match
(1) Herbarium - Is a place where dried and pressed animal specimens are kept in sheets.
(2) Key -A list that enumerates methodically all the species found in an area with a brief description aiding identification.
(3) Museum - It is a place having a collection of preserved plants and animals.
(4) Catalogue- A booklet containing a list of characters and their alternates which are helpful in the identification of various taxa.

150. What is correct with respect to growth?
(1) Increase in body mass is a criterion for growth.
(2) Increase in body mass is not observed in non-living things.
(3) Increase in mass from outside is the basis of growth in living beings.
(4) Growth is considered as defining property of living beings.

(ZOOLOGY)

SECTION – A

151. A student was given a sample of tissue. He observes and concludes the following characters.
(i) The cells are composed of a single layer of tall and slender cells.
(ii) Their nuclei are located at the base.
(iii) Free surface may have microvilli.
(iv) It is found in the lining of stomach and intestine.
(v) They help in secretion and absorption.
Based on the above features identify the epithelium-
(1) Cuboidal epithelium
(2) Columnar Epithelium
(3) Squamous epithelium
(4) Glandular epithelium

152. Find the **incorrectly** matched pair.
(1) Unicellular glandular cells - Goblet cell
(2) Saliva - Exocrine secretion
(3) Fusiform fibres - Smooth muscle
(4) Cartilage – Areolar connective tissue

153. Nervous tissue cells that play several supporting roles but do not transmit impulses are called-
(1) Glial cells
(2) Dendrites
(3) Nerve cells
(4) Neurons

154. A student was given a sample of two tissues. He observe the tissues under the microscope and draws their figures (A and B) as shown below. Identify the tissues given below-

A B

(1) A: Columnar cells bearing cilia;
B: Unicellular glandular epithelium
(2) A: Cuboidal cells bearing cilia;
B: Multicellular glandular epithelium
(3) A: Compound cells bearing cilia;
B: Unicellular glandular epithelium
(4) A: Columnar cells bearing cilia;
B: Multicellular glandular epithelium

155. Which of the following statement(s) is/are correct regarding compound epithelium?
(1) It is made of more than one layer of cells and thus has a limited role in secretion and absorption.
(2) Their main function is to provide protection against chemical and mechanical stresses.
(3) They cover the dry surface of the skin, moist surface of buccal cavity, pharynx, inner lining of ducts of salivary glands and pancreatic ducts.
(4) All of the above.

156. Which one of the following statement(s) is/are correct regarding respiration?
(1) Amphibians like frogs can respire through their moist skin only.
(2) Special vascularised structures called gills are used by most of the aquatic arthropods only.
(3) This process of exchange of O_2 from the atmosphere with CO_2 produced by the cells is called breathing.
(4) All of the above.

157. Match column-I (type of epithelium) with column-II (description) and choose the correct option.

	Column-I		**Column-II**
A	Squamous epithelium	I	It is composed of a single-layer of cube-like cells.
B	Cuboidal epithelium	II	Having cilia on their free epithelial surface.
C	Columnar epithelium	III	It is composed of a single epithelium layer of tall and slender cells.
D	Ciliated epithelium	IV	It is made up of a single thin epithelium layer of flattened cells with irregular boundaries.

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

158. Which of the following normally contains the highest concentration of oxygen?
(1) Body cells
(2) Inhaled air
(3) Air in the pulmonary trunk
(4) Blood entering the lungs

159. Listed below are respiratory capacities and volumes (A-D) in column I and II of a normal human adult.

	Column-I		**Column-II**
A	Residual volume	I	2500 mL
B	Vital capacity	II	3500 mL
C	Inspiratory reserve volume	III	1200 mL
D	Inspiratory capacity	IV	4500 mL

Which one of the following is the correct matching of two capacities and volume?
(1) A – I; B – II; C – III; D – IV.
(2) A – IV; B – III; C – I; D – II.
(3) A – II; B – III; C – IV; D – I.
(4) A – III; B – IV; C – I; D – II.

160. Identify the type of connective tissue in the given figures-I and II.

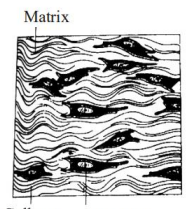


Fig-I

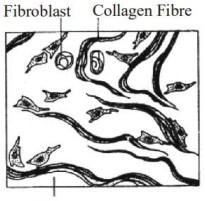


Fig-II

	Figure I	**Figure II**
(1)	Dense regular connective tissue	Dense irregular connective tissue
(2)	Loose irregular connective tissue	Loose regular connective tissue
(3)	Adipose tissue	Specialized connective tissue
(4)	Areolar connective tissue	Adipose tissue

161. What happens during inspiration?
(i) Size of our chest increases.
(ii) Size of our chest decreases.
(iii) Carbon dioxide is removed out from body.
(iv) Air enters our lungs.
(1) (i) and (ii)
(2) (i) and (iv)
(3) (ii) and (iii)
(4) (ii) and (iv)

162. Which of the following statement is **incorrect** for the digestive system of frog?
(1) Liver secretes bile that is stored in the gall bladder.
(2) The alimentary canal is long because frogs are carnivores and hence the length of intestine is increased.
(3) Digestion of food takes place by the action of HCl and gastric juices secreted from the walls of the stomach.
(4) The undigested solid waste moves into the rectum and passes out through cloaca.

163. Match the column I (Organs) with column II (Functions) and choose the correct option.

	Column-I		**Column-II**
A	Nose	I	Stops food from going down into lungs.
B	Epiglottis	II	Produces sound.
C	Pharynx	III	Traps bacteria as well as dust.
D	Larynx	IV	Allows air to pass from nose to trachea.

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

164. Compared to those of humans, the erythrocytes in frog are-
(1) Without nucleus but with haemoglobin.
(2) Nucleated and with haemoglobin.
(3) Very much smaller and fewer.
(4) Nucleated and without haemoglobin.

165. Which of the following statements is **correct** regarding mechanism of breathing?
(1) Inspiration can occur if the inter-pulmonary pressure is less than the atmospheric pressure.
(2) The contraction of external inter-costal muscles lifts down the ribs.
(3) On an average, a healthy human breathes 12-16 times/second.
(4) Expiration takes place when the intra-pulmonary pressure is higher than the atmospheric pressure.

166. A frog never drinks water but absorbs it through one of its respiratory organ. Identify the organ?
(1) Skin (2) Lung
(3) Buccal cavity (4) None of the above.

167. **Assertion:** If two men, expire the same volume of air after normal inspiration, they have the same expiratory capacity.
Reason: Expiratory capacity includes tidal volume and inspiratory reserve volume.
(1) Both assertion and reason are true and the reason is the correct explanation of the assertion.
(2) Both assertion and reason are true but the reason is not the correct explanation of the assertion.
(3) Assertion is true but reason is false.
(4) Both assertion and reason are false.

168. Which of the following statements regarding frog is **incorrect**?
(1) Fertilization is external and takes place in water.
(2) External ear and tympanum can be seen externally.
(3) In females the ureters and oviduct open separately in the cloaca.
(4) Copulatory pad on the first digit of the fore limbs and vocal sac are present in male frog.

169. **Assertion:** Basophils cells secrete histamine.
Reason: Histamine is a vasoconstrictor.
(1) Both assertion and reason are true and the reason is the correct explanation of the assertion.
(2) Both assertion and reason are true but the reason is not the correct explanation of the assertion.
(3) Assertion is true but reason is false.
(4) Both assertion and reason are false.

170. Which of the following group are supported by incomplete cartilaginous rings?
(1) Pharynx, primary & tertiary bronchi and initial bronchioles.
(2) Trachea, primary & secondary bronchi, and initial bronchioles.
(3) Larynx, primary, secondary and tertiary bronchi, and initial bronchioles.
(4) Trachea, primary, secondary and tertiary bronchi, and initial bronchioles.

171. Which of the following statements is **incorrect** regarding muscular tissue?
(1) Muscle fibres contract (shorten) in response to stimulation.
(2) Muscle fibres are composed of numerous fine fibrils, called myofibrils.
(3) Each muscle is made of few short, cylindrical fibres arranged in parallel arrays.
(4) Muscle action moves the body to adjust to the changes in the environment and to maintain the positions of the various parts of the body.

172. Intercostal muscles are found attached with-
(1) Diaphragm
(2) Ribs
(3) Pleura
(4) Lungs

173. Which of the following statements is **incorrect** regarding cartilage?
(1) The intracellular material of cartilage is solid and pliable.
(2) Chondrocytes are enclosed in small cavities within the matrix secreted by them.
(3) Cartilage is present in the tip of nose, outer ear joints and etc.
(4) Most of the cartilages in vertebrate embryos are replaced by bones in adults.

174. Residual air mostly occurs in -
(1) Alveoli
(2) Bronchus
(3) Nostrils
(4) Trachea

175. Which of the following statements is **not incorrect** regarding human respiratory system?
(1) We have two pair of external nostrils opening out above the upper lips.
(2) The nasal chamber opens into the larynx, a portion of which is the common passage for food and air.
(3) During swallowing glottis can be covered by a thick elastic cartilaginous flap called epiglottis.
(4) Larynx is a cartilaginous box which helps in sound production and hence called the sound box.

176. Match the terms given in column-I with their feature given in column-II and choose the correct option.

	Column-I		Column-II
A	Exocrine gland	I	They help to stop substances from leaking across a tissue.
B	Endocrine gland	II	Hormones are secreted directly into the fluid bathing the gland.
C	Tight junctions	III	They perform cementing to keep neighbouring cells together.
D	Adhering junctions	IV	Secretes mucus, saliva, earwax, oil, milk, digestive enzymes and other cell products.

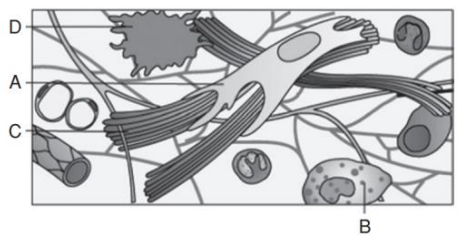
(1) A – IV; B – II; C – I; D – III
(2) A – II; B – IV; C – I; D – III
(3) A – IV; B – II; C – III; D – I
(4) A – IV; B – I; C – II; D – III

177. The smallest and thinnest tube in the lung is-
(1) Trachea (2) Larynx
(3) Bronchi (4) Bronchioles

178. Which of the following statements is **correct** regarding respiratory organs?
(1) Lower invertebrates like sponges, coelenterates, flatworms, etc., exchange O_2 with CO_2 by simple diffusion over their entire body surface.
(2) Mammals have a less developed respiratory system.
(3) Earthworms use their lungs for respiration.
(4) Mechanisms of breathing is same for different groups of animals.

179. Functional residual capacity can be represented as-
(1) TV + ERV
(2) ERV + RV
(3) RV + IRV
(4) ERV + TV + IRV

180. Identify A to D given in the figure.



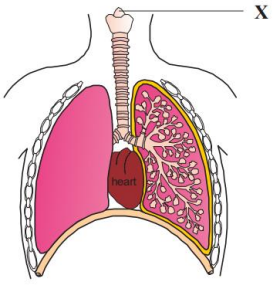
(1) A–Collagen fibres, B–Macrophage, C–Mast cell, D–Fibroblast
(2) A–Macrophage, B–Fibroblast, C–Mast cell, D–Collagen fibres
(3) A–Mast cell, B–Collagen fibres, C–Macrophage, D–Fibroblast
(4) A–Fibroblast, B–Mast cell, C–Collagen fibres, D–Macrophage

181. Which of the following statements is **incorrect** regarding human respiratory system?
(1) The lungs are situated in the thoracic chamber which is anatomically an air-tight chamber.
(2) The conducting part transports the atmospheric air to the alveoli, clears it from foreign particles, humidifies and also brings the air to body temperature.
(3) Two lungs which are covered by a single layered pleura, with pleural fluid between them.
(4) Exchange part is the site of actual diffusion of O_2 and CO_2 between blood and atmospheric air.

182. The kind of epithelium which forms the inner walls of blood vessels is-
(1) Cuboidal epithelium
(2) Columnar epithelium
(3) Ciliated columnar epithelium
(4) Squamous epithelium

183. The shape of a person's ear is mainly due to-
(1) Dense regular connective tissue
(2) Dense irregular connective tissue
(3) Elastic cartilage
(4) Fibrocartilage

184. In the given diagram of human respiratory system what is the function of structure marked as X?



(1) To prevent food from entering into trachea.
(2) To filter and warm the air.
(3) To help in exchange of gases.
(4) To catch dust and bacteria.

185. Which of the following statements is **incorrect** regarding cardiac muscle tissue?
(1) It is a contractile tissue present only in the heart.
(2) Cell junctions fuse the plasma membranes of these cells and make them stick together.
(3) Communication junctions at some fusion points allow the cells to contract as a unit, i.e., when one cell receives a signal to contract, its neighbours are also stimulated to contract.
(4) Muscle fibres of this tissue taper at both ends (fusiform) and do not show striations.

186. Thoracic chamber is formed ___(A)___ by the vertebral column, ___(B)___ by the sternum, ___(C)___ by the ribs and on the ___(D)___ side by the dome shaped diaphragm. Identify A, B, C and D.
(1) A – dorsally, B – ventrally, C – laterally, D – lower
(2) A – ventrally, B – laterally, C – dorsally, D – upper
(3) A – laterally, B - ventrally, C – dorsally, D – lower
(4) A – dorsally, B - laterally, C – ventrally, D – upper

187. **Assertion:** Tendons are used to attach bone to bone
Reason: Ligaments are used to attach muscle to bone.
(1) Both assertion and reason are true and the reason is the correct explanation of the assertion.
(2) Both assertion and reason are true but the reason is not the correct explanation of the assertion.
(3) Assertion is true but reason is false.
(4) Both assertion and reason are false.

188. The pharynx functions as a ___i___, whereas the larynx functions as a ___ii___.
(1) i- common passage for air and food; ii- passageway for food only.
(2) i- passageway for air only; ii- passageway for air and food.
(3) i- common passageway for air and food; ii- passageway for air only.
(4) i- block to bacteria; ii- passage for air and food.

189. The total volume of air a person can expire after normal inspiration is called-
(1) Residual volume
(2) Vital capacity
(3) Expiratory capacity
(4) Functional residual capacity

190. Match the column I (animals) with column II (mode of respiration) and choose the correct option.

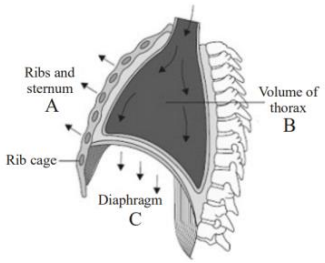
	Column – I		**Column - II**
A.	Earthworm	I.	Pulmonary
B.	Human	II.	Branchial
C.	Prawn	III.	Tracheal
D.	Insects	IV.	Cutaneous

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

191. Intercalated discs are the communication junctions between the cells of-
(1) Cardiac muscles
(2) Striated muscles
(3) Adipose tissue
(4) Nerve and striated muscles

192. Which of the following statements is **incorrect** regarding Frog?
(1) The blood vascular system involves heart, blood vessels and blood.
(2) The elimination of nitrogenous wastes is carried out by a less developed excretory system.
(3) On land, the buccal cavity, skin and lungs act as the respiratory organs.
(4) During aestivation and hibernation gaseous exchange takes place through skin.

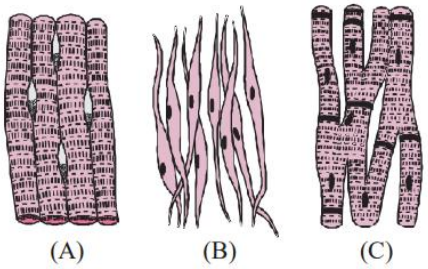
193. The figure given below shows the mechanism of breathing. Identify the stage (X) of breathing explained & A, B and C marked in the figure.



(1) X – Expiration, A– raised, B – decreased, C – relaxed
(2) X – Inspiration, A – raised, B – decreased, C – relaxed
(3) X – Expiration, A – raised, B – increased, C – contracted
(4) X - Inspiration, A– raised, B – increased, C – contracted

194. Even when there is no air in it, human trachea does not collapse due to presence of -
(1) Bony rings
(2) Chitinous rings
(3) Both (1) and (2)
(4) Cartilaginous rings

195 Identify the types of muscle tissue given below-



(1) A – Smooth muscle, B – Cardiac muscle, C – Skeletal muscle
(2) A – Skeletal muscle, B – Smooth muscle, C – Cardiac muscle
(3) A – Cardiac muscle, B – Smooth muscle, C – Skeletal muscle
(4) A – Smooth muscle, B –Skeletal muscle, C – Cardiac muscle

196. Which of the following statements is **incorrect** regarding specialized connective tissue?
(1) Bones have a hard and non-pliable ground substance rich in calcium salts.
(2) Blood is a fluid connective tissue containing plasma, red blood cells (RBCs) only.
(3) Cartilage, bones and blood are various types of specialised connective tissues.
(4) Bones support and protect softer tissues and organs.

197. Which one of the following four organs of respiratory system is **correctly** matched with its characteristics?
A. Bronchi – Two branches of the trachea that brings air into the lungs.
B. Trachea – Small flap that prevents food from entering
C. Diaphragm – Dome shaped muscle that pushes on the lungs during exhalation.
D. Alveoli – Pair of organs that inflate as you inhale and deflate as you exhale.
(1) A and B only (2) C and D only
(3) A and C only (4) B and D only

198. Which of the following statements is **correct**?
(1) Inspiration is a passive process whereas expiration is active.
(2) Inspiration is active process whereas expiration is passive.
(3) Inspiration and expiration are active process.
(4) Inspiration and expiration are passive process.

199. **Assertion:** Urinary bladder can considerably expand to accommodate urine.
Reason: It is lined by stretchable transitional epithelium.
(1) Both assertion and reason are true and the reason is the correct explanation of the assertion.
(2) Both assertion and reason are true but the reason is not the correct explanation of the assertion.
(3) Assertion is true but reason is false.
(4) Both assertion and reason are false.

200. Choose the **correctly** matched pair-
(1) Tendon – Specialized connective tissue
(2) Adipose tissue – Dense connective tissue
(3) Areolar tissue – Loose connective tissue
(4) Cartilage – Loose connective tissue

capsule. The cell wall determines the shape of the cell and provides a strong structural support to prevent the bacterium from bursting or collapsing. The plasma membrane is selectively permeable in nature and interacts with the outside world. This membrane is similar structurally to that of the eukaryotes.

Solution

increase the surface area of the plasma membrane and enzymatic content.

107. (3)

NCERT Pg.No-95

RER is frequently observed in the cells actively involved in protein synthesis and secretion. They are extensive and continuous with the outer membrane of the nucleus.

108. (2)

NCERT Pg.No-91

Bacterial cells may be motile or non-motile. If motile, they have thin filamentous extensions from their cell wall called flagella. Bacteria show a range in the number and arrangement of flagella.

109. (3)

NCERT Pg.No-93

In human beings, the membrane of the erythrocyte has approximately 52 per cent protein and 40 per cent lipids.

110. (1)

NCERT Pg.No-90

The genetic material is basically naked, not enveloped by a nuclear membrane. In addition to the genomic DNA (the single chromosome/circular NA), many bacteria have small circular DNA outside the genomic DNA. These smaller DNA are called plasmids. The plasmid DNA confers certain unique phenotypic characters to such bacteria.

111. (2)

NCERT Pg.No-94

The middle lamella is a layer mainly of calcium pectate which holds or glues the different neighbouring cells together. The cell wall and middle lamellae may be traversed by plasmodesmata which connect the cytoplasm of neighbouring cells.

112. (2)

NCERT Pg.No- 94

The quasi-fluid nature of lipid enables lateral movement of proteins within the overall bilayer. This ability to move within the membrane is measured as its fluidity.

113. (4)

NCERT Pg.No-90

Glycocalyx differs in composition and thickness among different bacteria. It could be a loose sheath called the slime layer which provides sticky character.

114. (1)

NCERT Pg.No-90, 91, 92

Nucleoid and Chromatophore -Prokaryotes
Centriole-Eukaryotes

115. (1)

NCERT Pg.No-87, 88

P. Palade	1.	Ribosome
Q. Robert Brown	2.	Nucleus
R. Schwann	3.	Cell theory
S. Camillo Golgi	4.	Golgi apparatus

116. (2)

NCERT Pg.No-98

Both Assertion and Reason are true but Reason is not correct explanation of Assertion

117. (4)

NCERT Pg.No-95

RER-Protein
SER- Steroidal hormone

118. (2)

NCERT Pg.No-94

Water moves across the membrane by osmosis. Active transport is a transport which is an energy dependent process, in which ATP is utilised e.g., Na^+/K^+ Pump.

119 (4)

NCERT Pg.No-91

Reserve materials in prokaryotic cells are stored in the cytoplasm in the form of inclusion bodies. These are not bound by any membrane system and lie free in the cytoplasm, e.g., phosphate granules, cyanophycean granules and glycogen granules.

120. (2)

NCERT Pg. no-95

RER is frequently observed in the cells actively involved in secretion.
RER are extensive and continuous with the outer membrane of the nucleus.

121. (1)

NCERT Pg. no-94

The cell wall of a young plant cell, the primary wall is capable of growth, which gradually diminishes as the cell matures and the secondary wall is formed on the inner (towards membrane) side of the cell.

122. (4)

NCERT Pg.No-91

In some prokaryotes like cyanobacteria, there are other membranous extensions into the cytoplasm called chromatophores which contain pigments.

123. (1)

NCERT Pg.No-96

Materials to be packaged in the form of vesicles from the ER fuse with the cis face of the Golgi apparatus and move towards the maturing face.

124. (3)

(1) Mitochondria and plastids in eukaryotes contain circular DNA.

(2) Prokaryotes have 70S type of ribosome present in the cytoplasm.

(3) Cell wall is made up of peptidoglycans in prokaryotes.

125. (3)

NCERT Pg.No-91

Reserve material in prokaryotic cells are stored in the cytoplasm in the form of inclusion bodies. These are not bound by any membrane system and lie free in the cytoplasm, e.g., phosphate granules, cyanophycean granules and glycogen granules. Gas vacuoles are found in blue green and purple and green photosynthetic bacteria.

126. (1)

NCERT Pg.No-11

Column-I		**Column-II**	
a	*tuberosum*	**i**	Species
b	Polymoniales	**ii**	Order
c	*Solanum*	**iii**	Genus
d	Plantae	**iv**	Kingdom
e	Solanaceae	**v**	Family

127. (1)

NCERT Pg.No-5

All organisms, from the prokaryotes to the most complex eukaryotes can sense and respond to environmental cues. Photoperiod affects reproduction in seasonal breeders, both plants and animals. All organisms handle chemicals entering their bodies. All organisms therefore, are 'aware' of their surroundings. Human being is the only organism who is aware of himself, i.e., has self-consciousness. Consciousness therefore, becomes the defining property of living organisms.

128. (3)

NCERT Pg.No-7

Both the words in a biological name, when handwritten, are separately underlined, or printed in italics to indicate their Latin origin.

129. (2)

NCERT Pg.No-8

Each category, referred to as a unit of classification, in fact, represents a rank and is commonly termed as taxon (pl.: taxa).

130. (2)

NCERT Pg.No-12

The famous botanical gardens are at Kew (England), Indian Botanical Garden, Howrah (India) and at National Botanical Research Institute, Lucknow (India).

131. (2)

NCERT Pg.No-2,5,6

II. Photoperiod affect reproduction in plants.

III. Binomial nomenclature system was given by Carolus Linnaeus.

132. (2)

NCERT Pg.No-6

International Code for Botanical Nomenclature (ICBN)

133. (1)

NCERT Pg.No-4

Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A).

134. (4)

NCERT Pg.No-12

The herbarium sheets also carry a label providing information about date and place of collection, English, local and botanical names, family, collector's name, etc.

135. (1)

NCERT Pg. no-4

In plants, growth by cell division occurs continuously throughout their life span. In animals, growth is seen only up to a certain age. However, cell division occurs in certain tissues to replace lost cells.

136. (4)

NCERT Pg.No-90,93

In prokaryotes the plasma membrane is selectively permeable in nature and interacts with the outside world. This membrane is similar structurally to that of the eukaryotes. Lipids are present in it as bilayer. Proteins may be peripheral or integral in it.

137. (1)

NCERT Pg.No-94

An improved model of the structure of cell membrane was proposed by Singer and Nicolson (1972) widely accepted as fluid mosaic model.

138. (1)

NCERT Pg.No-91

Pili and fimbriae are surface structures of the bacteria but do not play a role in motility.

The pili are elongated tubular structures made of a special protein.

In some bacteria, they are known to help attach the bacteria to rocks in streams and also to the host tissues.

139. (4)

NCERT Pg.No-89,90,91

Inclusion bodies, cell wall, plasmid, mesosome and nucleoid are characteristics of prokaryotes.

Amoeba is eukaryote.

140. (1)

NCERT Pg. no-96

Lysosomes are formed by the process of packaging in the Golgi apparatus.

141. (3)

NCERT Pg.No-10,11

-ales for order

-aceae for family

142. (4)

NCERT Pg.No-6

The number of species that are known and described range between 1.7-1.8 million.

143. (2)

NCERT Pg.No-4

Living as well as non living both show growth.

144. (2)

NCERT Pg.No-13

The contrasting characteristics generally in a pair used for identification of animals in taxonomic key are referred to as couplet.

145. (1)

NCERT Pg.No-11

sapiens $\rightarrow$ *Homo* $\rightarrow$ Primata $\rightarrow$ Chordata $\rightarrow$ Animalia

146. (1)

NCERT Pg.No-11

Lower the taxa, more are the characteristics that the members within the taxon share. Higher the category, greater is the difficulty of determining the relationship to other taxa at the same level.

147. (3)

NCERT Pg.No-7

The scientific term for the categories is taxa. Here it must be recognised that taxa can indicate categories at very different levels. 'Plants' – also form a taxa. 'Wheat' is also a taxa. Similarly, 'animals', 'mammals', 'dogs' are all taxa – but dog is a mammal and mammals are animals. Therefore, 'animals', 'mammals' and 'dogs' represent taxa at different levels.

148. (4)

NCERT Pg.No-4

All living organisms are made of chemicals. These chemicals, small and big, belonging to various classes, sizes, functions, etc., are constantly being made and changed into some other biomolecules. These conversions are chemical reactions or metabolic reactions.

149. (3)

NCERT Pg.No-12,13,14

1. Herbarium - Is a place where dried and pressed plant specimens are kept in sheets.
2. Key - A booklet containing a list of characters and their alternates which are helpful in the identification of various taxa
3. Museum - It is a place having a collection of preserved plants and animals.
4. Catalogue- A list that enumerates methodically all the species found in an area with a brief description aiding identification.

150. (1)

NCERT Pg. No-4

1. Increase in body mass is a criterion for growth.
2. Increase in body mass is observed in non-living things.
3. Increase in mass from inside is the basis of growth in living beings.
4. Growth is considered as defining property of living beings.

151. (2)

Columnar epithelium is an epithelium consisting of one or more layers of elongated cells of cylindrical shape. They have oval nuclei that usually are situated in the lower part of the cell. Some cells have tiny hair-like structures known as cilia on their upper surfaces. Columnar cells with cilia can be found in the respiratory tracts. Other cells have minute finger-like projections called microvilli. These help to increase the surface area available for absorption and can be found in the lining of the intestines.

Refer from N.C.E.R.T. page no.-101.

152. (4)

Cartilage is a specialized connective tissue which forms the endoskeleton of the vertebrates. It is avascular and nutrient are diffused through the matrix. Some of the columnar or cuboidal cells get specialised for secretion and are called glandular epithelium. They are mainly of two types: unicellular, consisting of isolated glandular cells (goblet cells of the alimentary canal), and multicellular, consisting of cluster of cells (salivary gland). Exocrine glands secrete mucus, saliva and other cell products. These products are released through ducts or tubes. Smooth muscle fibres taper at both ends which means fusiform. **Refer from N.C.E.R.T. page no.-102,104,105.**

153. (1)

The neuroglial cells are non-excitable cells that protect and support neurons. The neuroglial cell which constitute the rest of the neural system protect and support neurons. Neuroglia make up more than one half the volume of neural tissue in our body.

Refer from N.C.E.R.T. page no.-105.

154. (4)

Tissue 1 is columnar cells bearing cilia and tissue 2 is multicellular glandular epithelium. Ciliated columnar epithelial cells possess fine hair like outgrowths, cilia on their free surfaces. These cilia are capable of rapid, rhythmic, wavelike beatings in a certain direction. This movement of the cilia in a certain direction causes the mucus, which is secreted by the goblet cells, to move (flow or stream) in that direction. Ciliated epithelium is usually found in the air passages like the nose.

It is also found in the uterus and fallopian tubes of females. Columnar epithelium with goblet cells is called glandular epithelium. Some parts of the glandular epithelium consist of such a large number of goblet cells that there are only a few normal epithelial cells left.

Refer from N.C.E.R.T. page no.-101 and 102.

155. (4)

Compound Epithelium consists of more than one layer of cells. Being multi-layered, compound epithelium have little role in secretion or absorption, but they provide protection to underlying tissues against mechanical, chemical, thermal or osmotic stresses.

Refer from N.C.E.R.T. page no.-102.

156. (3)

Special vascularised structures called gills are used by most of the aquatic arthropods and molluscs whereas vascularised bags called lungs are used by the terrestrial forms for the exchange of gases. Amphibians like frogs can respire through their moist skin, lungs and buccal cavity. **Refer from N.C.E.R.T. page no.-268.**

157. (1)

Cuboidal epithelium is a single layer of cube shaped cells with a centrally located nucleus. Ciliated epithelium is a type of bodily tissues that is lined with "ciliated" cells, which are basically cells that have small, hair-like protrusions known as "cilia" that can either help the cells move along the tissue or can help debris and waste move along the surface of the cells. Columnar epithelial cells occur in one or more layers. The cells are elongated and column-shaped. The nuclei are elongated and are usually located near the base of the cells. Squamous cells have the appearance of thin, flat plates. The shape of the nucleus usually corresponds to the cell form and help to identify the type of epithelium.

Refer from N.C.E.R.T. page no.-101.

158. (2)

Inhaled air has not yet exchanged gases with lung capillaries, therefore it contains the highest concentration of oxygen.

Refer from N.C.E.R.T. page no.-270,271.

159. (4)

Residual Volume (RV), about 1100-1200 mL, is the volume of air still remaining in the lungs after the expiratory reserve volume is exhaled. The Vital Capacity (VC), about 4,500 mL, is the total amount

of air that can be expired after fully inhaling (VC = TV + IRV + ERV). The Inspiratory Reserve Volume (IRV), about 2,500 mL, is the additional air that can be forcibly inhaled after the inspiration of a normal tidal volume. The Inspiratory Capacity (IC), about 3,500 mL, is the maximum amount of air that can be inspired (IC = TV + IRV).

Refer from N.C.E.R.T. page no.-272.

160. (1)

The figure I & II represent dense regular and dense irregular connective tissue respectively. In the dense regular connective tissues, the collagen fibres are present in rows between many parallel bundles of fibres. Tendons and ligaments are example of this tissue. Dense irregular connective tissue has fibroblasts and many fibres (mostly collagen) that are oriented differently. This tissue is present in the skin.

Refer from N.C.E.R.T. page no.-103.

161. (2)

When we breathe in, air goes through our nose and mouth, down over windpipe and into our lungs. As a result, size of our chest increases. When we breathe out, carbon dioxide is removed from our lungs.

Refer from N.C.E.R.T. page no.-270.

162. (2)

Alimentary Canal- long tube through which the food that we eat is passed. The alimentary canal is short in frogs, because frogs are carnivores and hence the length of intestine is reduced. In the herbivores, the alimentary canal is longer as compared to carnivore. All other statements are correct.

Refer from N.C.E.R.T. page no.- 116,117.

163. (2)

The small hair present in the cavity help to filter particles of dust and other foreign matter. Epiglottis is a leaf shaped cartilage which acts as a switch between the larynx and the oesophagus to permit air to enter the airway to the lungs and food to pass into the gastrointestinal tract. Pharynx is a cone shaped passageway leading from the oral and nasal cavities in the head to the trachea. The pharynx chamber serves both respiratory and digestive functions. Air passes in and out of the larynx each time the body inhales or exhales.

Refer from N.C.E.R.T. page no.-269.

164. (2)

RBCs of frog are nucleated and contain red coloured pigment called haemoglobin but the RBCs of humans are denucleated and contain haemoglobin.

Refer from N.C.E.R.T. page no.- 118.

165. (4)

Inspiration can occur if the pressure within the lungs (intra-pulmonary pressure) is less than the atmospheric pressure, i.e., there is a negative pressure in the lungs with respect to atmospheric pressure. On an average, a healthy human breathes 12-16 times/minute. The contraction of external inter-costal muscles lifts up the ribs and the sternum causing an increase in the volume of the thoracic chamber in the dorso-ventral axis. **Refer from N.C.E.R.T. page no.-270,271.**

166. (1)

The frog never drinks water but absorbs it through the skin. The skin is always maintained in a moist condition.

Refer from N.C.E.R.T. page no.-116.

167. (3)

Expiratory capacity is the total volume of air a person can expire after a normal inspiration. This includes tidal volume and expiratory reserve volume (TV + ERV).

Refer from N.C.E.R.T. page no.-272.

168. (2)

External ears are absent in frog and only tympanum can be seen externally. All other statements are correct.

Refer from N.C.E.R.T. page no.-116,118,119.

169. (3)

Basophils secrete histamine, heparin and serotonin etc. and are involved in inflammatory reaction. Histamine is a vasodilator and lower blood pressure.

Refer from N.C.E.R.T. page no.-103.

170. (4)

Trachea is a straight tube which extends up to the mid-thoracic cavity. The trachea divides at the level of 5th thoracic vertebra into right and left primary bronchi. Each bronchus undergoes repeated divisions to form secondary and tertiary bronchi and bronchioles. They finally end up in very thin terminal bronchioles. The trachea, bronchi and the initial bronchioles are supported by incomplete cartilaginous rings.

Refer from N.C.E.R.T. page no.-269.

171. (3)

Each muscle is made of many long, cylindrical fibres arranged in parallel arrays. These fibres are composed of numerous fine fibrils, called myofibrils. Muscle fibres contract (shorten) in response to stimulation, then relax (lengthen) and return to their uncontracted state in a coordinated fashion. Their action moves the body to adjust to the changes in the environment and to maintain the positions of the various parts of the body. In general, muscles play an active role in all the movements of the body.

Refer from N.C.E.R.T. page no.-104.

172. (2)

Intercostal muscle is a set of muscles attached to the ribs within the chest cavity that control the movement of the rib cage.

Refer from N.C.E.R.T. page no.- 270.

173. (1)

The intercellular material of cartilage is solid and pliable and resists compression. Cells of this tissue (chondrocytes) are enclosed in small cavities within the matrix secreted by them. Most of the cartilages in vertebrate embryos are replaced by bones in adults. Cartilage is present in the tip of nose, outer ear joints, between adjacent bones of the vertebral column, limbs and hands in adults.

Refer from N.C.E.R.T. page no.-104.

174. (1)

Residual air is the amount of air that remains in the lungs after a maximal expiration. This air mostly occurs in alveoli (the main site of gas exchange).

Refer from N.C.E.R.T. page no.-272.

175. (4)

We have a pair of external nostrils opening out above the upper lips. It leads to a nasal chamber through the nasal passage. The nasal chamber opens into the pharynx, a portion of which is the common passage for food and air. The pharynx opens through the larynx region into the trachea. Larynx is a cartilaginous box which helps in sound production and hence called the sound box. During swallowing glottis can be covered by a thin elastic cartilaginous flap called epiglottis to prevent the entry of food into the larynx.

Refer from N.C.E.R.T. page no.-269.

176. (1)

Match both the columns with their respective statements.

Refer from N.C.E.R.T. page no.-102.

177. (4)

Bronchiole is the smallest and thinnest tube in the lungs. It is the tiny branch of air tubes within the lungs that is a continuation of the bronchus. The terminal bronchioles are the final airways in the conducting zone. The primary function of the bronchioles is to conduct air from the bronchi to the alveoli, and to control the amount of air distributed through the lung by constricting and dilating.

Refer from N.C.E.R.T. page no.-269.

178. (1)

Mechanisms of breathing vary among different groups of animals depending mainly on their habitats and levels of organisation. Lower invertebrates like sponges, coelenterates, flatworms, etc., exchange O_2 with CO_2 by simple diffusion over their entire body surface. Earthworms use their moist cuticle for their respiration. Mammals have a well developed respiratory system.

Refer from N.C.E.R.T. page no.-268.

179. (2)

Functional residual capacity is the volume of air remaining in the lungs after a normal expiration (ERV + RV). It is about 2100-2300 ml.

Refer from N.C.E.R.T. page no.-272.

180. (4)

Areolar tissue present beneath the skin contain-Fibroblasts are the cells that produce and secrete fibre. Mast cells or Basophils secrete heparin, serotonin and histamine. Macrophage helps in ingest and degrade dead cells.

Refer from N.C.E.R.T. page no.- 103.

181. (3)

We have two lungs which are covered by a double layered pleura, with pleural fluid between them. It reduces friction on the lung-surface.

Refer from N.C.E.R.T. page no.-269.

182. (4)

Squamous epithelium is formed of thin discoidal and polygonal cells that fit like tiles in a floor, so is also called pavement epithelium. It is found in the walls of blood vessels, in the alveoli of lung for

exchange of gases, and in Bowman's capsule of nephron for ultra filtration.
Refer from N.C.E.R.T. page no.-101.

183. (3)
Elastic cartilage or yellow cartilage is a type of cartilage present in the outer ear, Eustachian tube and epiglottis. It contains elastic fibre networks and collagen fibres. The principal protein is in elastic cartilage is elastin.
Refer from N.C.E.R.T. page no.-104.

184. (1)
The label X represents epiglottis. Epiglottis is a structure (containing elastic cartilage) that prevents food from entering into trachea.
Refer from N.C.E.R.T. page no.-269.

185. (4)
The smooth muscle fibres taper at both ends (fusiform) and do not show striations but the cardiac muscles show striations.
Refer from N.C.E.R.T. page no.-105.

186. (1)
Thoracic chamber is formed dorsally by the vertebral column, ventrally by the sternum, laterally by the ribs and on the lower side by the dome shaped diaphragm. Thoracic cavity, also called chest cavity. It is enclosed by the ribs, the vertebral column, and the sternum and is separated from the abdominal cavity (the body's largest hollow space) by a muscular and membranous partition, the diaphragm.
Refer from N.C.E.R.T. page no.-270.

187. (4)
Tendons, which attach skeletal muscles to bones and ligaments which attach one bone to another are examples of dense regular connective tissues.
Refer from N.C.E.R.T. page no.- 103.

188. (3)
The nasal chamber opens into the pharynx, a portion of which is the common passage for food and air. The pharynx opens through the larynx which is the only chamber for air. Larynx is a cartilaginous box which helps in sound production and hence called the sound box.
Refer from N.C.E.R.T. page no.-269.

189. (3)
Expiratory capacity (EC) is the volume of air expired after a normal inspiration (TV + ERV).
Refer from N.C.E.R.T. page no.-271.

190. (3)
Mode of respiration in earthworm, human, prawn and insects are respectively cutaneous (skin), pulmonary (lung), branchial (branchial gills) and tracheal (trachea).
Refer from N.C.E.R.T. page no.-268.

191. (1)
Cardiac muscles are involuntary, striated & non-fatigued fibres. Cell junctions fuse the plasma membranes of cardiac muscle cells and make them stick together. Communication junctions (intercalated discs) at some fusion points allow the cells to contract as a unit, i.e., when one cell receives a signal to contract, its neighbouring cells are also stimulated to contract.
Refer from N.C.E.R.T. page no.-105.

192. (2)
Frogs respire on land and in the water by two different methods. On land, the buccal cavity, skin and lungs act as the respiratory organs. The respiration by lungs is called pulmonary respiration. During aestivation and hibernation gaseous exchange takes place through skin. The blood vascular system involves heart, blood vessels and blood. The elimination of nitrogenous wastes is carried out by a well developed excretory system.
Refer from N.C.E.R.T. page no.-117,118.

193. (4)
X – Inspiration, A – raised, B – increased, C – contracted. The given figure shows the inspiration stage of breathing. Inspiration is an active process which is due to muscle contraction. During inspiration, the external intercostal muscles contracts and the internal intercostal muscle relax. This pulls the ribcage up and down. At the same time the diaphragm muscle contracts which flattens the diaphragm. Both actions increase the volume of thorax.
Refer from N.C.E.R.T. page no.-271.

194. (4)
Trachea is a membranous tube supported by "C" shaped cartilage ring. The cartilage ring protects the trachea from collapse and injury.
Refer from N.C.E.R.T. page no.-269.

195. (2)
The given figures A, B and C are skeletal muscle, smooth muscle and cardiac muscle respectively. Skeletal muscle fibres occur in muscles which are

attached to the skeleton. They are striated in appearance and are under voluntary control. Smooth muscle fibres are located in walls of hollow visceral organs, except the heart, appear spindle-shaped, and are also under involuntary control. Cardiac muscle cells are located in the walls of the heart, appear striated, and are under involuntary control.

Refer from N.C.E.R.T. page no.-105.

196. (2)

Blood is a fluid connective tissue containing plasma, red blood cells (RBCs), white blood cells (WBCs) and platelets. It is the main circulating fluid that helps in the transport of various substances.

Refer from N.C.E.R.T. page no.-104.

197. (3)

Trachea (also called windpipe) is a tube that connects the pharynx and larynx to the lungs, allowing the passage of air, and so is present in all air-breathing animals with lungs. Alveoli – main site of gaseous exchanges.

Refer from N.C.E.R.T. page no.-269.

198. (2)

Inspiration is the active process because during inspiration there is active contraction of muscles and diaphragm while expiration (breathing out) is the passive process because during this process muscles and diaphragm are in the relaxed state.

Refer from N.C.E.R.T. page no.-270,271.

199. (1)

Transitional epithelium is a type of stratified epithelium. is a type of tissue that changes shape in response to stretching (stretchable epithelium). Transitional epithelium lines the organs of the urinary system and is known here as urothelium.

Refer from N.C.E.R.T. page no.-101.

200. (3)

Loose connective tissue has cells and fibres loosely arranged in a semi-fluid ground substance, for example, areolar tissue present beneath the skin. Adipose tissue is another type of loose connective tissue located mainly beneath the skin. Cartilage and tendon are the types of dense regular connective tissue.

Refer from N.C.E.R.T. page no.-103.