

- (3) Kinetochore
- (4) Satellite

NEET UG (2024)

103. Large and more numerous nucleoli are present in which are actively carrying out

- (1) Protein synthesis
- (2) Lipid synthesis
- (3) Steroidal hormone synthesis
- (4) Carbohydrate synthesis

104. Find the correct match

(1)	Metacentric chromosome	-	Centromere forming two unequal arms of chromosome
(2)	Telocentric chromosome	-	Centromere close to its end
(3)	Acrocentric chromosome	-	Terminal centromere
(4)	Sub-metacentric	-	Centromere slightly away from middle

- (4) The number and shape of chloroplasts is variable

Biology Quiz-16

106. The axoneme of eukaryotic flagella usually has

- (1) 9 + 2 arrangement of microtubules
- (2) 9 + 0 arrangement of microtubules
- (3) Cartwheel appearance
- (4) 9 +2 arrangement of protofilaments

107. Read statements A and B choose the correct option.

A – Cytoplasm is a semi fluid matrix that occupies the volume of the cell only in eukaryotic cell.

B – It is the main arena of cellular activities

- (1) Both statements [A] and [B] are correct
- (2) Statement [A] is correct and statement [B] is incorrect
- (3) Statement [A] is incorrect and statement [B] is correct
- (4) Both the statements are correct and [B] is the correct explanation of [A]

108. The fluid nature of the membrane helps to perform function like
 (a) Cell growth & cell division
 (b) Formation of intercellular junction
 (c) Endocytosis
 (1) Only (c) (2) (b) & (c) only
 (3) (a) & (c) only (4) (a), (b) & (c)

109. Select the **odd** one out with respect to functions of endomembrane system.
 (1) Formation of glycoproteins and glycolipids
 (2) Intracellular and intercellular digestion
 (3) Active rRNA synthesis
 (4) Synthesis of lipids and steroids

110. Read the following statements and choose the correct option.

Statement A: No organelles, like the ones in eukaryotes, are found in prokaryotic cells except for ribosomes.

Statement B: Fimbriae are known to help in attaching the bacteria to rocks in streams and also to the host tissue.

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

111. Select the mismatched pair.

(1)	Rudolf Virchow	-	<i>Omnis cellula-e-cellula</i>
(2)	Robert Brown	-	Discovered the nucleus
(3)	Leeuwenhoek	-	First described a live cell
(4)	Schwann and Schleiden	-	Modified and gave final shape to cell theory

112. A specialised extension of prokaryotic cell membrane. Which help in respiration and secretion processes is called.

- (1) Chromatophores (2) Capsule
 (3) Mesosome (4) Glycocalyx

113. Animal cells are different from plant cells in presence of

- (1) Cell wall (2) Centrioles
 (3) Ribosomes (4) Plastids

114. Select the **incorrect** match.

(1)	<i>Mycoplasma</i>	-	The smallest cell
(2)	Centriole	-	Non-membrane bound organelle
(3)	Glycocalyx	-	Composition similar in all bacteria
(4)	Inclusion bodies	-	Glycogen granules

115. The structure which confers certain unique phenotypic characters to bacteria but is not vital for survival, is

- (1) Genomic DNA (2) Plasmids
 (3) Nucleoid (4) Cell membrane

116. Select the **odd** one w.r.t SER.

- (1) Major site for lipid synthesis
 (2) Synthesis of steroidal hormones
 (3) Frequently observed in cells actively involved in protein synthesis
 (4) Detoxification of drugs

117. Chloroplast and mitochondria show similarity in presence of

- (1) Ability to synthesise all of their proteins
 (2) Cardiolipins in the inner membrane
 (3) 70S ribosome
 (4) rRNA only

118. Which of the following statements is **not** correct?

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

119. Which one of the following cell organelles is enclosed by a single membrane?

- (1) Nuclei (2) Mitochondria
 (3) Chloroplasts (4) Lysosomes

120. Which of the following structures is **not** found in a prokaryotic cell?

- (1) Plasma membrane
 (2) Nuclear envelope
 (3) Ribosome
 (4) Mesosome

121. Which of the following are **not** membrane-bound?

- (1) Mesosomes (2) Vacuoles
 (3) Ribosomes (4) Lysosomes

122. DNA is **not** present in

- (1) Mitochondria (2) Chloroplast
 (3) Ribosomes (4) Nucleus

123. Select the correct matching in the following pairs

- (1) Rough ER – Oxidation of fatty acids
 (2) Smooth ER – Oxidation of phospholipids
 (3) Smooth ER – Synthesis of lipids
 (4) Rough ER – Synthesis of glycogen

124. Which structures perform the function of mitochondria in bacteria?

- (1) Nucleoid (2) Ribosomes
- (3) Cell wall (4) Mesosomes

125. Centromere is a part of

- (1) Chromosome (2) Endoplasmic reticulum
- (3) Ribosomes (4) Mitochondria

126. Arrange the different layers of plant cell wall A, B and C from outside to inside

A– This layer is capable of growth and diminishes gradually as the cell matures

B– Formed towards membrane side of the cell

C– This layer holds or glues different neighbouring cell together

- (1) $B \rightarrow C \rightarrow A$ (2) $C \rightarrow A \rightarrow B$
- (3) $A \rightarrow B \rightarrow C$ (4) $B \rightarrow A \rightarrow C$

127. Read the statements [A] and [B] carefully and choose the correct option.

[A] The content of nucleolus is continuous with the rest of the nucleoplasm

[B] Nucleolus is not a membrane bound structure

- (1) Both the statements [A] and [B] are incorrect
- (2) Statement [A] is correct and statement [B] is incorrect
- (3) Both the statements [A] and [B] are correct and [B] is the correct explanation of [A]
- (4) Statement [A] is incorrect and statement [B] is correct

128. Arrange the following cells in descending order of their size and choose the correct option.

Bacteria, Ostrich egg, Mycoplasma, Human RBC

- (1) *Ostrich egg* > *Bacteria* > *Human RBC* > *Mycoplasma*
- (2) *Ostrich egg* < *Human RBC* < *Bacteria* < *Mycoplasma*
- (3) *Mycoplasma* < *Bacteria* < *Human RBC* < *Ostrich egg*
- (4) *Ostrich egg* > *Human RBC* > *Bacteria* > *Mycoplasma*

129. Which one is **odd** w.r.t. basal of cilia/ flagella in eukaryotes?

- (1) Control their movement
- (2) It has 9 + 0 arrangement of microtubules
- (3) It is formed by centriole
- (4) It consists of flagellin and tubulin proteins

130. Centrifugal cytokinesis

- (1) Occurs in animal
- (2) Occurs by cell furrowing
- (3) Occurs by cell plate formation
- (4) Is characteristic of bacteria and lower plants only

131. What will be the total number of mitotic divisions in the formation of 64 daughter cells?

- (1) 6 (2) 32
- (3) 63 (4) 16

132. Identify the phase at which most organelles duplicate

- (1) M-phase (2) G_1 phase
- (3) G_0 phase (4) G_2 phase

133. In animal cell, cytokinesis is achieved by

- (1) Furrow formation with the help of microfilaments
- (2) Cell plate formation with the help of microtubules
- (3) Appearance of furrow with the help of microtubules
- (4) Cell plate formation with the help of myosin protein

134. The chromatin in the nucleus contains

- (1) DNA and histone proteins only
- (2) DNA, histone proteins and RNA
- (3) DNA, histone proteins and non-histone proteins
- (4) DNA, histone proteins, some non-histone proteins and RNA

135. During which phase of cell cycle, genetic material becomes double?

- (1) Gap_2 phase (2) Synthesis phase
- (3) Gap_1 phase (4) Quiescent phase

SECTION-B

136. The phase between two successive M phase is called

- (1) Prophase (2) Metaphase
- (3) Anaphase (4) Interphase

137. The quiescent stage of cell is

- (1) An inactive state of cell w.r.t. cell division
- (2) An abnormal stage of dividing cell
- (3) Seen only in meristematic tissues
- (4) Not found in higher animals

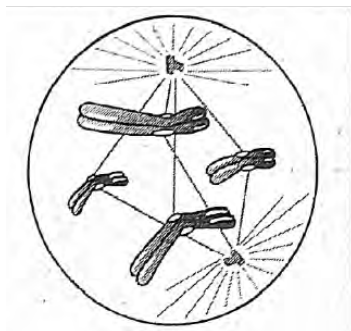
138. Chromosomal material condenses to form compact mitotic chromosomes. This process starts during

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

139. A metaphasic chromosome in mitotic division is made up of

- (1) 2 sister chromatids
- (2) 4 sister chromatids
- (3) 2 non-homologous chromosomes
- (4) 2 homologous chromosomes

- 140.** Choose the **odd** one for metaphase.
- (1) Each chromosome has two chromatids
 - (2) Attachment of spindle fibres to kinetochore
 - (3) Splitting of centromere
 - (4) Alignment of chromosome at equator
- 141.** In all of the given phases, amount of DNA in a cell is double but the chromosome number is same, **except**
- (1) Post mitotic gap phase
 - (2) Synthesis phase
 - (3) Pre mitotic gap phase
 - (4) Prophase
- 142.** Mitosis occurs in
- (1) Both haploid and diploid cells of plant
 - (2) Only diploid cell of animals but never in plants
 - (3) Only haploid cells of animal
 - (4) Only diploid cells of plant
- 143.** Choose characteristics of a cell during G_0 stage:
- (1) Metabolically active but no longer proliferate
 - (2) Cells enter to G_2 phase
 - (3) Cells may divide occasionally to replace cells lost due to injury or death
 - (4) Both (1) and (3)
- 144.** Select the **odd** one w.r.t the significance of mitosis.
- (1) Production of diploid daughter cells with identical genetic complement
 - (2) Growth of multicellular organisms
 - (3) Healing and repair
 - (4) Multinucleate cell formation
- 145.** A state of mitosis is shown in the diagram. Which stage is it and what are its characteristics?



- (1) Anaphase – chromatids move to opposite poles
 - (2) Metaphase – Spindle fibres attached to chromosome
 - (3) Late prophase – Nuclear membrane, nucleolus Golgi complexes and ER disappeared
 - (4) Transition to metaphase – Spindle fibres attached to kinetochores of chromosomes
- 146.** Condensation of chromosomes is completed and they can be observed clearly under the microscope in
- (1) Anaphase
 - (2) Telophase
 - (3) Prophase
 - (4) Metaphase
- 147.** Following are the important events for telophase, **except**
- (1) Nucleolus, Golgi complex and ER reappear
 - (2) Nuclear envelope assembles around the chromatin clusters
 - (3) Chromatin cluster at opposite poles
 - (4) Chromosomes decondense and maintain their individuality
- 148.** Restorage of nucleocytoplasmic ratio is performed in
- (1) S- Phase
 - (2) G_2 - Phase
 - (3) M – Phase
 - (4) G_1 – Phase
- 149.** Select the correct sequence of events taking place during mitotic anaphase.
- A**– Chromatids separate
B– Centromeres split
C– Chromatids move to opposite poles
- (1) B → A → C
 - (2) C → B → A
 - (3) A → B → C
 - (4) A → C → B
- 150.** A typical diploid cell of maize root has 20 chromosomes. How many chromosomes will be present in the cell at G_1 phase, after S-phase and after M phase respectively?
- (1) 10, 10, 10
 - (2) 20, 20, 20
 - (3) 20, 40, 40
 - (4) 40, 40, 40

(ZOOLOGY)

SECTION: A

- 151.** When the percentage saturation of haemoglobin with O_2 is plotted against the pO_2 , we get:
- (1) J-shaped curve
 - (2) L-shaped curve
 - (3) S-shaped/sigmoid curve
 - (4) Rectangular graph
- 152.** Mammalian lungs contain an enormous number of minute alveoli. This is to allow:
- (1) More space for increasing the total volume of inspired air
 - (2) More surface area for diffusion of gases
 - (3) More spongy texture for keeping lungs in proper shape
 - (4) More nerve supply to keep, the organs working more efficiently
- 153.** Read the following statements and choose the option having **incorrect** statements only.
- (A) Trachea divides at the level of 5th thoracic vertebra into a right and left primary bronchi.
- (B) Initial bronchioles are supported by complete cartilaginous rings.
- (C) Each terminal bronchiole gives rise to a number of very thin, irregular walled and vascularised bag-like structures called bronchi.
- (D) Larynx is a cartilaginous box which helps in sound production and hence called the sound box.
- (1) A only
 - (2) B and C only
 - (3) A, D and C
 - (4) B, C and D
- 154.** Which of the following statements is **incorrect**?
- (1) Blood from right side of heart is carried to lungs by pulmonary artery
 - (2) Pleura is double membranous covering of kidney
 - (3) Pancreas is both exocrine and endocrine gland
 - (4) Scurvy is due to vitamin C deficiency
- 155.** In lungs, air is separated from venous blood by
- (1) Squamous epithelium + tunica externa of blood vessel
 - (2) Squamous epithelium + endothelium of blood vessel
 - (3) Transitional epithelium + tunica media of blood vessel
 - (4) Columnar epithelium + 3 layered wall of blood vessel
- 156.** Rate and depth of respiration shall increase when
- (1) Oxygen concentration increases
 - (2) CO_2 concentration increases
 - (3) Bicarbonate concentration increases
 - (4) Bicarbonate concentration decreases
- 157.** Which is the site of actual diffusion of O_2 and CO_2 between blood and atmospheric air?
- (1) Exchange part of respiratory system
 - (2) Conducting part of respiratory system
 - (3) Inner pleural membrane.
 - (4) Alveolar duct
- 158.** All of the following favour the dissociation of oxyhaemoglobin to deliver O_2 to tissues **except**-
- (1) pCO_2 increase
 - (2) pO_2 increase
 - (3) Temperature increase
 - (4) pO_2 decrease
- 159.** Which is the **correct** sequence of the air passage in man?
- (1) Nasal cavity → Larynx → Trachea → Pharynx → Bronchi → Bronchioles → Alveoli
 - (2) Nasal cavity → Larynx → Pharynx → Trachea → Bronchi → Bronchioles → Alveoli
 - (3) Nasal cavity → Pharynx → Larynx → Trachea → Bronchi → Bronchioles → Alveoli
 - (4) Nasal cavity → Larynx → Bronchi → Pharynx → Trachea → Bronchioles → Alveoli
- 160.** What would happen when blood is acidic?
- (1) Binding of oxygen with haemoglobin Increases
 - (2) Red blood corpuscles are formed in higher number
 - (3) Binding of oxygen with haemoglobin decreases
 - (4) There is no change in oxygen binding nor number of RBCs.

161. Air entering lungs is

- (A) Warmed
- (B) Filtered
- (C) Deprived of some oxygen
- (D) Enriched with CO₂

Which of the following is **true**?

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

162. Which of the following is entirely made up of cartilage?

- (1) Nasal septum
- (2) Larynx
- (3) Glottis
- (4) Trachea

163. Which of the following is **not** supported by cartilage rings?

- (1) Primary bronchiole
- (2) Alveoli
- (3) Trachea
- (4) Secondary bronchiole

164. Inspiration occurs when intra pulmonary pressure is-.

- (1) Higher than atmospheric pressure
- (2) Lower than atmospheric pressure
- (3) Equal to atmospheric pressure
- (4) Zero compared to atmospheric pressure

165. Respiratory centre of brain is stimulated by

- (1) Carbon dioxide content in venous blood
- (2) Carbon dioxide content in arterial blood
- (3) Oxygen content in venous blood
- (4) Oxygen content in arterial blood

166. Match the columns

Column-I		Column-II	
(a)	Asthma	(i)	Runny Nose , Sneezing
(b)	ORD	(ii)	Inflammation of bronchi & bronchiole
(c)	Rhinitis	(iii)	Alveolar wall damaged
(d)	Emphysema	(iv)	Fibrosis
		(v)	Cough with blood stained sputum

- (1) a - iv, b - ii, c - v, d - i
- (2) a - v, b - iii, c - ii, d - i
- (3) a - iii, b - i, c - v, d - iv
- (4) a - ii, b - iv, c - i, d - iii

167. Match the columns

Column-I		Column-II	
(a)	Asthma	(p)	Damaged alveolar wall
(b)	Emphysema	(q)	Accumulation of fluid in alveoli
(c)	Pneumonia	(r)	Inflammation of bronchi & bronchiole

- (1) a - r, b - p, c - q (2) a - q, b - p, c - r
- (3) a - r, b - q, c - p (4) a - q, b - r, c - p

168. Which one of these statements is **correct**?

- (1) All animals require a medium for cellular respiration
- (2) In all animal oxygen is transported by blood
- (3) All animals take oxygen from water or air through gills of lungs
- (4) All animals need oxygen for respiration

169. **Assertion:** During inspiration, the volume of thoracic cavity increases.

Reason: This happens due to the relaxation of diaphragm and intercostal muscles.

- (1) If both assertion and reason are true and reason is the correct explanation of assertion
- (2) If both assertion and reason are true but reason is not the correct explanation of assertion
- (3) If assertion is true but reason is false
- (4) If both assertion and reason are false

170. **Assertion:** Vital capacity is higher in athletes than non-athletes.

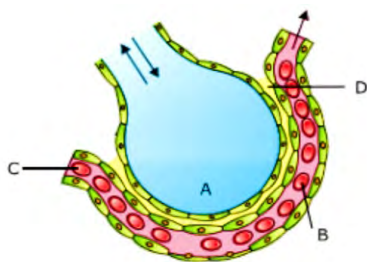
Reason: Vital capacity is about 3.5-4.5 liters in a normal adult person.

- (1) If both assertion and reason are true and reason is the correct explanation of assertion
- (2) If both assertion and reason are true but reason is not the correct explanation of assertion
- (3) If assertion is true but reason is false
- (4) If both assertion and reason are false

171. Which one of the following statements is **incorrect**?

- (1) The residual air in lungs slightly decrease the efficiency of respiration in mammals
- (2) The presence of non-respiratory air sacs, increases the efficiency of respiration in birds
- (3) In insects, circulating body fluids serve to distribute oxygen to tissue
- (4) The principle of counter current flow facilitates efficient respiration in gills of fishes

172. The figure given below shows a small part of human lung where exchange of gases takes place. In which one of the options given below, the one part A, B, C or D is correctly identified along with its function.



- (1) C : arterial capillary - passes oxygen to tissues
- (2) A : alveolar cavity - main site of exchange of respiratory gases
- (3) D : Capillary wall - exchange of O_2 and CO_2 takes place here.
- (4) B : red blood cell - transport of CO_2 mainly

173. Listed below are four respiratory capacities (I-IV) and four jumbled respiratory volumes of a normal human adult.

Respiratory capacity Respiratory Volume

I. Residual volume 1200 mL

II. Vital capacity 3000 mL

III. Inspiratory reserve volume 1500 mL

IV. Inspiratory Capacity 3500 mL

Which one of the following is the **correct matching** of two capacities and volumes?

- (1) II 3000 mL, III 1500 mL
 - (2) III 1500 mL, IV 3500 mL
 - (3) IV 3500 mL, I 1200 mL
 - (4) I 1200 mL, II 3000 mL
174. What is **true** about RBCs in humans?
- (1) They carry about 20-25 per cent of carbon dioxide
 - (2) They transport 99.5 per cent of oxygen
 - (3) They transport about 80 per cent oxygen only and the rest 20 per cent of it is transported in dissolved state in blood plasma
 - (4) They do not carry carbon dioxide at all

175. What is the role of hemoglobin in the respiratory system?
- (1) To protect the lungs from infections.
 - (2) To transport oxygen from the lungs to the body tissues,
 - (3) To regulate the rate of breathing.
 - (4) To remove carbon dioxide from the body.

176. Asthma is caused due to:
- (1) Infection of lungs
 - (2) Inflammation of bronchi & bronchiole
 - (3) Bleeding into pleural cavity
 - (4) Infection of trachea
177. In which condition, oxygen dissociation curve of haemoglobin shift to right of normal curve?
- (1) Decrease in pH
 - (2) Decrease in CO_2 concentration
 - (3) Decrease in acidity
 - (4) Decrease in temperature
178. In mammals, carbon dioxide is transported from tissues to respiratory surface by:
- (1) Red blood corpuscles only
 - (2) RBCs and WBCs
 - (3) Plasma and RBCs
 - (4) Plasma only
179. CO_2 is transported as:
- (1) Carboxyhemoglobin
 - (2) As sodium bicarbonate
 - (3) In oxyhaemoglobin
 - (4) Dissolved in blood plasma
180. The total number of alveoli present in the human lungs is estimated to be around:
- (1) 700 millions each
 - (2) 600 millions each
 - (3) 200 millions each
 - (4) 300 millions each
181. **Assertion:** Erythrocytes contain Hb which binds with oxygen.
Reason: Leucocytes are of five types and mainly involves in providing immunity.
- (1) If both assertion and reason are true and reason is the correct explanation of assertion
 - (2) If both assertion and reason are true but reason is not the correct explanation of assertion
 - (3) If assertion is true but reason is false
 - (4) If both assertion and reason are false
182. **Assertion:** Globulins primarily are involved in defense mechanisms of the body and the albumins help in osmotic balance.
Reason: A healthy individual has 10-20 gms of haemoglobin in every 100 ml of blood.
- (1) If both assertion and reason are true and reason is the correct explanation of assertion
 - (2) If both assertion and reason are true but reason is not the correct explanation of assertion
 - (3) If assertion is true but reason is false
 - (4) If both assertion and reason are false

183. The artery which supplies blood to the diaphragm is known as

OR

The diaphragm is supplied with blood by

- (1) Cardiac artery (2) Phrenic artery
(3) Lingual artery (4) Lumbar artery

184. Arteries are

- (1) Thin-walled and blood flows under diminished pressure
(2) Thick-walled and blood flows under high pressure
(3) Thick-walled and blood flows under low pressure
(4) Thick-walled and blood flows under diminished pressure

185. Which of the following sequence is truly a systemic circulation pathway?

- (1) Right ventricle → Pulmonary aorta → Tissues → Pulmonary veins → Left auricle
(2) Right ventricle → Left ventricle → Aorta → Tissues → veins → Right auricle
(3) Left auricle → Left ventricle → Pulmonary aorta → Tissues → Right auricle
(4) Left ventricle → Aorta → Arteries → Tissues → Veins → Right atrium

SECTION - B

186. If due to some injury the chordae tendinae of the tricuspid valve of the human heart is partially non-functional, what will be the immediate effect?

- (1) The flow of blood into the aorta will be slowed down
(2) The 'Pacemaker' will stop working
(3) The blood will tend to flow back into the left atrium
(4) The flow of blood into the pulmonary artery will be reduced

187. An artificial pacemaker is implanted subcutaneously and connected to the heart in patients

- (1) Having 90% blockage of the three main coronary arteries
(2) Having a very high blood pressure
(3) With irregularity in the heart rhythm
(4) Suffering from arteriosclerosis

188. Which one of the given statement is **correct** with reference to the circulation of blood in a mammal?

- (1) Left auricle receives oxygenated blood from the lungs
(2) Pulmonary artery returns oxygenated blood from the lungs to the left auricle
(3) Pulmonary vein carries venous blood from right auricle to lungs
(4) Venous blood is returned to the left auricle

189. Rh⁻ person donated blood to Rh⁺ person for the second time, then

- (1) Rh⁻ person will die
(2) Nothing happens to Rh⁺ person
(3) Rh⁺ blood starts reacting to Rh⁻ blood
(4) Rh⁺ person will die

190. The deoxygenated blood pumped into the pulmonary artery is passed on to the lungs from where the oxygenated blood is carried by the pulmonary veins into the left atrium. This pathway constitutes the:

- (1) Systemic circulation
(2) Pulmonary circulation
(3) Single circulation
(4) Double circulation

191. One difference between blood and lymph is that:

- (1) Blood contains WBCs and lymph contains RBCs
(2) Blood contains RBCs and WBCs and lymph contains only WBCs
(3) Blood contains RBCs and lymph contains WBCs
(4) Blood is liquid while lymph is solid

192. Which of the following are most abundant in WBCs?

- (1) Neutrophils
(2) Basophils
(3) Eosinophils
(4) Lymphocytes

193. Given below are four statements (a-d) regarding human blood circulatory system

- (a) Arteries are thick-walled and have narrow lumen as compared to veins
(b) Angina is acute chest pain when the blood circulation of the brain is reduced
(c) Persons with blood group AB can donate blood to any person with any blood group under ABO system
(d) Calcium ions play a very important role in blood clotting

Which two of the above statements are **correct**?

- (1) (c) and (d)
(2) (a) and (d)
(3) (a) and (b)
(4) (b) and (c)

194. A person with unknown blood group under ABO system, has suffered much blood loss in an accident and needs immediate blood transfusion. His one friend who has a valid certificate of his own blood type offers blood donation without delay. What would have been the type of blood of the donor friend?

- (1) Type B (2) Type AB
(3) Type O (4) Type A

195. Which of the following statements is correct regarding Rh Incompatibility..

- (1) Rh antigens of the foetus do not get exposed to the Rh-ve blood of the mother in the first pregnancy as the two bloods are well separated by the placenta.
(2) In such cases, the mother not preparing antibodies against Rh antigen in her blood..
(3) A special case of Rh incompatibility (mismatching) has been observed between the Rh +ve blood of a pregnant mother with Rh -ve blood of the foetus.
(4) Due to Rh incompatibility foetus RBCs become rectangular in shape.

196. How much percentage of plasma is present in the blood?

- (1) 35% (2) 45%
(3) 55% (4) 50%.

197. Which of the following statements is **incorrect**?

- (1) Blood corpuscles are RBCs, and WBCs.
(2) Blood platelets help in blood clotting.
(3) Blood contains chondroblast cells.
(4) Lymph contains lymphocytes.

198. Match column I, II and III

Column I	Column II	Column III
A-Fish	i) muscular tube like heart	i) double circulation
B- Cockroach	ii) 4-chambered heart	ii) single circulation
C-Birds	iii) 2-chambered heart	iii) neurogenic heart

- (1) A→(iii),(ii) B→(i),(iii) C→(ii),(i)
(2) A→(ii),(i) B→(iii),(i) C→(i),(ii)
(3) A→(i),(iii) B→(ii),(i) C→(ii),(iii)
(4) A→(ii),(i) B→(iii),(i) C→(i),(iii)

199. Match the different types of heart given in column I with organisms given in the column II. Choose the correct combination.

- | Column-I | Column-II |
|----------------------------|----------------------|
| P. Neurogenic heart | i. Human |
| Q. Bronchial heart | ii. Cockroach |
| R. Myogenic heart | iii. Shark |
- (1) P→(ii) Q→(i) R→(iii)
(2) P→(ii) Q→(iii) R→(i)
(3) P→(i) Q→(ii) R→(iii)
(4) P→(iii) Q→(ii) R→(i)

200. Match Column I with Column II:

- | Column-I | Column-II |
|---------------------------|----------------------------------|
| (A) Eosinophils | (i) Coagulation |
| (B) RBCs | (ii) Universal Recipient |
| (C) AB blood group | (iii) Resist Infections |
| (D) Platelets | (iv) Contraction of Heart |
| (E) Systole | (v) Gas transport |
- (1) A→(iii) B→(v) C→(ii) D→(iv) E→(i)
(2) A→(ii) B→(v) C→(i) D→(iii) E→(iv)
(3) A→(iii) B→(v) C→(ii) D→(i) E→(iv)
(4) A→(ii) B→(iii) C→(iv) D→(iv) E→(i)

(BOTANY)

- 101. (3)**
Nucleolus is the site for r-RNA synthesis.
[NCERT Pg no. – 100]
- 102. (3)**
Kinetochore is the site for attachment of spindle fibre on chromosome.
[NCERT Pg no. – 101]
- 103. (1)**
Larger and more numerous nucleoli are present in cells which are actively carrying out protein synthesis.
[NCERT Pg no. – 100]
- 104. (4)**
Metacentric chromosome - Centromere forming two equal arms of chromosome
Telocentric chromosome - Terminal centromere
Acrocentric chromosome - Centromere close to its end
[NCERT Pg no. – 101]
- 105. (2)**
Chloroplast is double membrane bound, with the inner membrane being less permeable.
[NCERT Pg no. – 98]
- 106. (1)**
The axoneme of eukaryotic flagella usually has 9 + 2 arrangement of microtubules.
[NCERT Pg no. – 99]
- 107. (3)**
Cytoplasm is a semifluid matrix that occupies the volume of the cell in both prokaryotic and eukaryotic cells.
[NCERT Pg no. – 88]
- 108. (4)**
The fluid nature of the membrane is important for functions like cell growth, formation of intercellular junctions, secretion, endocytosis, cell division etc.
[NCERT Pg no. – 94]
- 109. (3)**
Nucleolus is the site for active r-RNA synthesis.
[NCERT Pg no. – 100]
- 110. (3)**
Both statements are correct
[NCERT Pg no. - 90, 91]
- 111. (4)**
Rudolph Virchow modified and gave final shape to cell theory.
[NCERT Pg no.– 90]
- 112. (3)**
Mesosome help in respiration and secretion processes.
[NCERT Pg no.– 90]
- 113. (2)**
Animal cells are different from plant cells in presence of centrioles.
[NCERT Pg no.– 91]
- 114. (3)**
Glycocalyx differs in composition and thickness among different bacteria.
[NCERT Pg no. – 90]
- 115. (2)**
Bacteria have small circular DNA outside the genomic DNA, called plasmid.
[NCERT Pg no. – 90]
- 116. (3)**
RER is observed in cells actively involved in protein synthesis.
[NCERT Pg no. - 95]
- 117. (3)**
Both chloroplast and mitochondria show similarity in presence of 70s ribosome, ds circular DNA, RNA etc.
[NCERT Pg no. - 97, 98]
- 118. (4)**
Lysosomes are formed by the process of packaging in the golgi bodies.
[NCERT Pg no. – 95]
- 119. (4)**
Lysosomes are single membranous cell organelles.
[NCERT Pg no. – 95]
- 120. (2)**
Nuclear envelope is absent in prokaryotic cell.
[NCERT Pg no. – 90]
- 121. (3)**
Ribosomes are non-membranous cell organelles.
[NCERT Pg no. – 91]
- 122. (3)**
Ribosomes are made up of RNA and proteins.
[NCERT Pg no. – 91]

123. (3)
RER - site for protein synthesis.
[NCERT Pg no. – 95]
124. (4)
Mesosomes perform functions like respiration, secretion etc.
[NCERT Pg no. – 90]
125. (1)
Centromere is a part of chromosome.
[NCERT Pg no. – 101]
126. (2)
A - Primary wall - Capable of growth.
B - Secondary wall - formed on inner side of the cell
C - Middle lamellae - glues the different neighbouring cells together.
[NCERT Pg no. – 94]
127. (3)
The content of nucleolus is continuous with the rest of the nucleoplasm.
[NCERT Pg no.- 100]
128. (4)

Ostrich egg	>	Human RBC	>	Bacteria	>
		(7.0µm)		(3-5µm)	
<i>Mycoplasma</i>					
(0.3µm)					

[NCERT Pg no. - 88, 89]
129. (4)
Basal body of cilia/flagella in eukaryotes consist of tubulin proteins.
[NCERT Pg no. – 99]
130. (3)
Centrifugal cytokinesis occurs by cell plate formation.
[NCERT Pg no. – 124]
131. (3)
Total number of mitotic division = $(n - 1)$
'n' → number of daughter cells = 64
So, number of mitotic division = $64 - 1 = 63$
[NCERT Pg no. – 124]
132. (2)
Most of cell organelle duplication takes place at G_1 phase of cell cycle.
[NCERT Pg no. – 121]

133. (1)
In animal cell, cytokinesis achieved by furrow formation with the help of microfilaments.
[NCERT Pg no. – 124]
134. (4)
The chromatin in the nucleus contains DNA, histone proteins, some non-histone proteins and RNA.
[NCERT Pg no.-]
135. (2)
Genetic material becomes doubles during S-phase (synthesis phase) of cell cycle.
[NCERT Pg no. – 121]
136. (4)
The phase between two successive M-phase is called interphase.
[NCERT Pg no. – 121]
137. (1)
The quiescent stage of cell is an inactive stage of cell w.r.t. cell division.
[NCERT Pg no.– 122]
138. (4)
During prophase, chromosomal material condenses to form compact mitotic chromosomes.
[NCERT Pg no. – 122]
139. (1)
A metaphasic chromosome in mitotic division is made up of 2 sister chromatids.
[NCERT Pg no.– 123]
140. (3)
Splitting of centromere takes place during anaphase.
[NCERT Pg no.– 123]
141. (1)
Post mitotic gap phase is G_1 phase.
NCERT - 121
142. (1)
Mitosis occurs in both haploid and diploid cells of plant.
[NCERT Pg no. – 122]
143. (4)
Cells in G_0 phase are metabolically active but no longer proliferate and cells may divide occasionally to replace cells lost due to injury or death.
[NCERT Pg no. – 122]

144. (4)
Multinucleate cell formation takes place when karyokinesis is not followed by cytokinesis
[NCERT Pg no. – 100]
145. (4)
Transition to metaphase - spindle fibres attached to kinetochores of chromosomes.
[NCERT Pg no. – 123]
146. (4)
Condensation of chromosomes is completed and they can be observed clearly under the microscope in metaphase.
[NCERT Pg no. – 123]
147. (4)
Chromosomes decondense and lose their individuality.
[NCERT Pg no. – 124]

148. (3)
Restorage of nucleocytoplasmic ratio is performed in M-phase.
[NCERT Pg no. – 121]
149. (1)
 $B \rightarrow A \rightarrow C$
[NCERT Pg no. – 123]
150. (2)
There is no change in chromosome number during mitotic division, so it will remain same, 20.
[NCERT Pg no. – 122]

(ZOOLOGY)

151. (3)
A sigmoid curve is obtained when percentage saturation of haemoglobin with O_2 is plotted against the pO_2 . This curve is called the Oxygen dissociation curve (Figure 17.5) and is highly useful in studying the effect of factors like pCO_2 , H^+ concentration, etc., on binding of O_2 with haemoglobin.
NCERT 11th Page no. 274
152. (2)
Each terminal bronchiole gives rise to a number of very thin, irregular-walled and vascularised bag-like structures called alveoli.
NCERT 11th Page no. 269
153. (2)
Trachea is a straight tube extending up to the mid-thoracic cavity, which divides at the level of 5th thoracic vertebra into a right and left primary bronchi. Each bronchi undergoes repeated divisions to form the secondary and tertiary bronchi and bronchioles ending up in very thin terminal bronchioles.
NCERT 11th Page no. 269
154. (2)
Two lungs which are covered by a double layered pleura, with pleural fluid between them.
NCERT 11th Page no. 269
155. (2)
The diffusion membrane is made up of three major layers (Figure 17.4) namely, the thin squamous epithelium of alveoli, the endothelium of alveolar capillaries and the basement substance (composed of a thin basement membrane supporting the

squamous epithelium and the basement membrane surrounding the single layer endothelial cells of capillaries) in between them.

NCERT 11th Page no. 273

156. (2)
Textual based
NCERT 11th Page no. 270
157. (1)
Alveoli are the primary sites of exchange of gases. Exchange of gases also occurs between blood and tissues. O_2 and CO_2 are exchanged in these sites by simple diffusion mainly based on pressure/concentration gradient.
NCERT 11th Page no. 272
158. (2)
In the alveoli, where there is high pO_2 , low pCO_2 , lesser H^+ concentration and lower temperature, the factors are all favourable for the formation of oxyhaemoglobin,
NCERT 11th Page no. 270
159. (3)
Textual Based
NCERT 11th Page no. 269
160. (3)
In the tissues, where low pO_2 , high pCO_2 , high H^+ concentration and higher temperature exist, the conditions are favourable for dissociation of oxygen from the oxyhaemoglobin.
NCERT 11th Page no. 274

161. (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.

NCERT 11th Page no. 269

162. (2)

Larynx is a cartilaginous box which helps in sound production and hence called the sound box.

NCERT 11th Page no. 269

163. (2)

The tracheae, primary, secondary and tertiary bronchi, and initial bronchioles are supported by incomplete cartilaginous rings. Each terminal bronchiole gives rise to a number of very thin, irregular-walled and vascularised bag-like structures called alveoli.

NCERT 11th Page no. 269

164. (2)

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.

NCERT 11th Page no. 270

165. (2)

Receptors associated with the aortic arch and carotid artery also can recognize changes in CO_2 and H^+ concentration and send necessary signals to the rhythm center for remedial actions.

NCERT 11th Page no. 275

166. (4)

Asthma is a difficulty in breathing causing wheezing due to inflammation of bronchi and bronchioles.

Emphysema is a chronic disorder in which alveolar walls are damaged due to which respiratory surface is decreased. One of the major causes of this is cigarette smoking.

NCERT 11th Page no. 275

167. (1)

Asthma is a difficulty in breathing causing wheezing due to inflammation of bronchi and bronchioles.

Emphysema is a chronic disorder in which alveolar walls are damaged due to which respiratory surface is decreased. One of the major causes of this is cigarette smoking.

NCERT 11th Page no. 275

168. (1)

Text Based

NCERT 11th Page no. 269

169. (3)

Inspiration is initiated by the contraction of diaphragm which increases the volume of thoracic chamber in the antero-posterior axis.

NCERT 11th Page no. 270-271

170. (2)

The maximum volume of air a person can breathe in after a forced expiration. This includes ERV, TV and IRV or the maximum volume of air a person can breathe out after a forced inspiration.

NCERT 11th Page no. 272

171. (1)

Volume of air remaining in the lungs even after a forcible expiration. This averages 1100 mL to 1200 mL. By adding up a few respiratory volumes described above, one can derive various pulmonary capacities, which can be used in clinical diagnosis.

NCERT 11th Page no. 272

172. (2)

Alveoli are the primary sites of exchange of gases. Exchange of gases also occur between blood and tissues. O_2 and CO_2 are exchanged in these sites by simple diffusion mainly based on pressure/concentration gradient.

NCERT 11th Page no. 272

173. (3)

Text Based

NCERT 11th Page no. 272

174. (1)

As the solubility of CO_2 is 20-25 times higher than that of O_2 , the amount of CO_2 that can diffuse through the diffusion membrane per unit difference in partial pressure is much higher compared to that of O_2 .

NCERT 11th Page no. 273

175. (2)

Each haemoglobin molecule can carry a maximum of four molecules of O_2 . Binding of oxygen with haemoglobin is primarily related to partial pressure of O_2 .

NCERT 11th Page no. 274

176. (2)
Asthma is a difficulty in breathing causing wheezing due to inflammation of bronchi and bronchioles.
NCERT 11th Page no. 275
177. (1)
In the alveoli, where there is high pO_2 , low pCO_2 , lesser H^+ concentration and lower temperature, the factors are all favourable for the formation of oxyhaemoglobin.
NCERT 11th Page no. 274
178. (3)
Nearly 20-25 per cent of CO_2 is transported by RBCs whereas 70 per cent of it is carried as bicarbonate. About 7 per cent of CO_2 is carried in a dissolved state through plasma.
NCERT 11th Page no. 274
179. (4)
Nearly 20-25 per cent of CO_2 is transported by RBCs whereas 70 per cent of it is carried as bicarbonate. About 7 per cent of CO_2 is carried in a dissolved state through plasma
NCERT 11th Page no. 274
180. (4)
Text Based
NCERT 11th Page no. 273
181. (2)
Each haemoglobin molecule can carry a maximum of four molecules of O_2 . Binding of oxygen with haemoglobin is primarily related to partial pressure of O_2 .
NCERT 11th Page no. 274
182. (3)
A healthy individual has 12-16 gms of haemoglobin in every 100 ml of blood. These molecules play a significant role in transport of respiratory gases.
NCERT 11th Page no. 279
183. (2)
Text Based
NCERT 11th Page no. 282
184. (2)
The tunica media is comparatively thin in the veins.
NCERT 11th Page no. 286
185. (4)
Text Based
NCERT 11th Page no. 287
186. (4)
Textual Based
NCERT 11th Page no. 283
187. (3)
Text Based
NCERT 11th Page no. 284
188. (1)
The deoxygenated blood pumped into the pulmonary artery is passed on to the lungs from where the oxygenated blood is carried by the pulmonary veins into the left atrium.
NCERT 11th Page no. 286
189. (2)
Text Based
NCERT 11th Page no. 280
190. (2)
The deoxygenated blood pumped into the pulmonary artery is passed on to the lungs from where the oxygenated blood is carried by the pulmonary veins into the left atrium. This pathway constitutes the pulmonary circulation.
NCERT 11th Page no. 286
191. (2)
Lymph is a colourless fluid containing specialised lymphocytes which are responsible for the immune responses of the body.
NCERT 11th Page no. 282
192. (1)
Neutrophils are the most abundant cells (60-65 per cent) of the total WBCs.
NCERT 11th Page no. 279
193. (2)
Angina- A symptom of acute chest pain appears when not enough oxygen is reaching the heart muscle.
NCERT 11th Page no. 288
194. (3)
Group 'O' blood can be donated to persons with any other blood group and hence 'O' group individuals are called 'universal donors'. Persons with 'AB' group can accept blood from persons

with AB as well as the other groups of blood. Therefore, such persons are called 'universal recipients'.

NCERT 11th Page no. 280

195. (1)

Rh antigens of the foetus do not get exposed to the Rh-ve blood of the mother in the first pregnancy as the two bloods are well separated by the placenta.

NCERT 11th Page no. 281

196. (3)

Plasma is a straw coloured, viscous fluid constituting nearly 55 per cent of the blood.

NCERT 11th Page no. 278

197. (3)

Lymph is a colourless fluid containing specialised lymphocytes which are responsible for the immuneresponses of the body

NCERT 11th Page no. 282

198. (1)

Fishes have a 2-chambered heart with an atrium and a ventricle. Amphibians and the reptiles (except crocodiles) have a 3-chambered heart with two atria and a single ventricle, whereas crocodiles, birds and mammals possess a 4-chambered heart with two atria and two ventricles.

NCERT 11th Page no. 282

199. (2)

A specialised cardiac musculature called the nodal tissue is also distributed in the heart (myogenic).

NCERT 11th Page no. 284

200. (3)

We have two main categories of WBCs – granulocytes and agranulocytes. Neutrophils, eosinophils and basophils are different types of granulocytes, while lymphocytes and monocytes are the agranulocytes. Neutrophils are the most abundant cells (60-65 per cent) of the total WBCs and basophils are the least (0.5-1 per cent) among them. Neutrophils and monocytes (6-8 per cent) are phagocytic cells which destroy foreign organisms entering the body. Basophils secrete histamine, serotonin, heparin, etc., and are involved in inflammatory reactions. Eosinophils (2-3 per cent) resist infections and are also associated with allergic reactions. Platelets also called thrombocytes, are cell fragments produced from megakaryocytes (special cells in the bone marrow). Platelets can release a variety of substances most of which are involved in the coagulation or clotting of blood.

NCERT 11th Page no. 279-280