# (BOTANY)

# <u>SECTION – A</u>

101. Match Column-I with Column -II

	Column-I		Column-II
А	M-Phase	Ι	Proteins are
			synthesised
В	G2 – Phase	II	Inactive phase
С	Quiescent	III	Interval between
	stage		mitosis and initiation
			of DNA replication
D	G <sub>1</sub> – Phase	IV	Equational division

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

#### 102. Given below are two statements.

**Statement-I:** During Go-phase of cell cycle, the cell is metabolically inactive.

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

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

- (1) Both statement-I and statement-II are false
- (2) Statement-I is true, but statement-II is false
- (3) Statement-I is false, but statement-II is true
- (4) Both statement-I and statement-II are true
- **103.** The fruit fly has 8 chromosomes (2n) in each cell. During interphase of mitosis, if the number of chromosomes at G<sub>1</sub>-phase is 8, what would be the number of chromosomes after S-phase?
  - (1) 8
  - (2) 16
  - (3) 4
  - (4) 32

104. Members of phycomycetes are found-

- (I) In aquatic habitat.
- (II) On decaying wood.
- (III) On moist and damp places.
- (IV) As obligate parasite on plants.
- (1) III and IV
- (2) I and IV
- (3) II and III
- (4) All of the above

**105.** Given below is a schematic break-up of the phases/stages of cell cycle.



Which of the following is the **correct** indication of the stage/phase in the cell cycle?

- (1) B-metaphase (2) C-karyokinesis
- (3) D-synthetic phase (4) A-cytokinesis
- **106.** At what stage of the cell cycle centriole duplicates in a eukaryotic cell?
  - (1) During G<sub>2</sub>-stage of prophase
  - (2) During S-phase
  - (3) During entire prophase
  - (4) During telophase

#### **107.** In the somatic cell cycle

- (1) in G<sub>1</sub>-phase DNA content is double the amount of DNA present in the original cell
- (2) DNA replication takes place in S-phase
- (3) a short interphase is followed by a long mitotic phase
- (4) S-phase follows mitotic phase

**108.** Select the **incorrect** statement with reference to mitosis.

- (1) Spindle fibres attach to centromere of chromosomes
- (2) Chromosomes decondense at telophase
- (3) Splitting of centromere occurs at anaphase
- (4) All the chromosomes lie at the equator at metaphase.
- **109.** Which of the following options gives the **correct** sequences of events during mitosis?
  - (1) Condensation → nuclear membrane disassembly → crossing over → segregation → telophase
  - (2) Condensation → nuclear membrane disassembly → arrangement at equator → centromere splitting → segregation → telophase
  - (3) Condensation→ crossing over → nuclear membrane disassembly → segregation→ telophase
  - (4) Condensation → arrangement at pole → centromere splitting → segregation → telophase

**110.** A stage in cell division is shown in the figure. Select the answer which gives **correct** identification of the stage with its characteristic mentioned.



(1)	Telophase	_	Nuclear	envelope
			reforms, Golg	gi complex
			reforms	

- (2) Late Chromosomes move anaphase away from equatorial plate, Golgi complex not present
- (3) Cytokinesis Cell plate formed, mitochondria distributed between two daughter cells
- (4) Anaphase Endoplasmic reticulum and nucleolus not reformed yet
- **111.** During meiosis I in human, both of the daughter cells receives -
  - (1) Only maternal chromosomes
  - (2) A mixture of maternal and paternal chromosomes
  - (3) The same number of chromosomes as a diploid cell
  - (4) A sister chromatid from each chromosome
- **112.** Which of the following is not true for homologous chromosome pairs?
  - (1) They come from both parents
  - (2) They usually contain slightly different versions of the same genetic information
  - (3) They segregate from each other during meiosis I
  - (4) They synapse during meiosis II
- **113.** Which cells cannot show meiosis?
  - $(1) \quad 2N, 4N, 6N \qquad (2) \quad 2N, 4N$ 
    - (3) N, 3N, 5N (4) Spore mother cell
- 114. Go through the following events-
  - I. Terminalization of chiasmata occurs
  - II. Chromosomes are fully condensed
  - III. Meiotic spindle is assembled
  - IV. By the end nuclear membrane and nucleolus disappear

The above points indicate that it is -

- (1) Zygotene stage (2) Diakinesis stage
- (3) Metaphase II (4) Pachytene

- **115.** Which is **correct** about S-phase (synthetic phase)?
  - I. It occurs between  $G_1$  and  $G_2$
  - II. It marks the period during which DNA replicates
  - III. At the end of this phase DNA is doubled but the number of chromosomes remains unchanged
  - IV. As the DNA is doubled in this phase number of chromosomes is also doubled
  - V. Centrioles replicate in this phase
  - VI. Amount of DNA changes from 2C to 4C
  - VII. It is pre  $G_2$  and post  $G_1$  phase
  - (1) I, II, IV, V, VI, VII are correct
  - (2) I, II, III, V, VI, VII are correct
  - (3) All are correct
  - (4) Only IV is correct
- **116.** Non-dividing cells like heart cells, neuron are in\_\_\_\_\_Phase.
  - (1)  $G_1$  (2)  $G_2$
  - (3)  $G_4$  (4)  $G_0$
- **117.** Which of the following **correctly** indicates the stages of mitosis at which particular events occurs?

	DNA	Breakdown	Division of
	replication	of nuclear	centromere
		membrane	
(1)	Interphase	Metaphase	Metaphase
(2)	Interphase	Prophase	Anaphase
(3)	Interphase	Interphase	Anaphase
(4)	Prophase	Prophase	Anaphase

**118. Statement -I:** Cytokinesis differs for plant and animal cells.

**Statement-II:** Mitosis provides growth, cell replacement, and asexual reproduction.

- (1) Both statements are correct.
- (2) Both statements are incorrect.
- (3) Only statement-I is correct.
- (4) Only statement-II is correct.
- **119. Assertion:** It is difficult to observe individual chromosomes during interphase.

**Reason:** They are in the form of long, thin thread.

- (1) If both Assertion & Reason are True and the Reason is a correct explanation of the Assertion.
- (2) If both Assertion & Reason are True but the Reason is not a correct explanation of the Assertion.
- (3) If Assertion is True but the Reason is false.
- (4) If both Assertion & Reason are false.

**120.** Statement -I: The sequence of cell cycle is G<sub>1</sub>, S, G<sub>2</sub> and M.

**Statement -II:** In meiosis I, the centromere undergoes no splitting.

- (1) Both statements are correct.
- (2) Both statements are incorrect.
- (3) Only statement-I is correct.
- (4) Only statement-II is correct.
- **121.** The exchange of genetic material between chromatids of paired homologous chromosomes during first meiotic division is called
  - (1) transformation (2) chiasmata
  - (3) crossing over (4) synapsis
- **122.** Meiosis has evolutionary significance because it results in
  - (1) genetically similar daughters
  - (2) four daughter cells
  - (3) eggs and sperms
  - (4) recombination
- **123.** Which statement best explains the evolutionary advantage of meiosis?
  - (1) Meiosis is necessary for sexual reproduction
  - (2) Genetic recombinations are possible from generation to generation
  - (3) Meiosis alternates with mitosis from generation to generation
  - (4) The same genetic system is passed on from generation to generation
- 124. Archaebacteria differ from eubacteria in
  - (1) cell wall structure
  - (2) mode of nutrition
  - (3) cell shape
  - (4) mode of reproduction
- **125.** Which of the following statements about *Euglena* is true?
  - (1) Euglenoids are flagellates
  - (2) *Euglena* placed in continuous darkness lose their photosynthetic activity and die
  - (3) The pigments of *Euglena* are quite different from those of green plants
  - (4) *Euglena* is a marine protist
- **126.** Which of the following is **incorrect** about cyanobacteria?
  - (1) They are photoautotrophs
  - (2) They lack heterocysts
  - (3) They often form blooms in polluted water bodies
  - (4) They have chlorophyll-a similar to green plants

- **127.** Which among the following are the smallest living cells, known without a definite cell wall, pathogenic to plants as well as animals and can survive without oxygen?
  - (1) Bacillus (2) Pseudomonas
  - (3) Mycoplasma (4) Nostoc
- 128. Statement-I Marsh gas is produced by Methanogens.
   Statement-II – Some bacteria have capsule out-

**Statement-II** – Some bacteria have capsule outside cell wall.

- (1) Both statements are correct.
- (2) Both statements are incorrect.
- (3) Only statement-I is correct.
- (4) Only statement-II is correct.
- **129.** Nuclear membrane is absent in
  - (1) Penicillium (2) Agaricus
  - (3) *Puccinia* (4) *Nostoc*
- **130.** Select the **correct** combination of the statement (i-iv) regarding the characteristics of certain organisms.
  - (i) Methanogens are archaebacteria which produce methane in marshy areas.
  - (ii) *Nostoc* is a filamentous blue-green alga which fixes atmospheric nitrogen.
  - (iii) Chemosynthetic autotrophic bacteria synthesise cellulose from glucose.
  - (iv) *Mycoplasma* lack a cell wall and can survive without oxygen.

The correct statements are

- (1) (ii) and (iii) (2) (ii), (iii) and (iv)
- (3) (i), (ii) and (iii) (4) (i), (ii) and (iv)
- 131. Assertion: Bacteria, the sole members of kingdom monera, are the most abundant microorganisms.Reason: Bacteria can tolerate extreme

conditions, so they are found everywhere.

- (1) If both Assertion & Reason are True and the Reason is a correct explanation of the Assertion.
- (2) If both Assertion & Reason are True but the Reason is not a correct explanation of the Assertion.
- (3) If Assertion is True but the Reason is false.
- (4) If both Assertion & Reason are false.
- **132.** Statement I The marine organisms showing spinning movements and responsible for killing fishes by producing toxins belong to the Protista kingdom of Whittaker.

**Statement II** - Protista differs from monera in having nuclear membrane.

- (1) Both statements are correct.
- (2) Both statements are incorrect.
- (3) Only statement-I is correct.
- (4) Only statement-II is correct.

- 133. Which of the following cannot fix nitrogen?
  - (1) Nostoc (2) Azotobacter
  - (3) Spirogyra (4) Anabaena
- 134. Ciliates differ from all other protozoans in
  - (1) using pseudopodia for capturing prey
  - (2) having a contractile vacuole for removing excess water
  - (3) using flagella for locomotion
  - (4) having thousands of cilia
- **135.** Sleeping sickness is caused due to:
  - (1) Plasmodium (2) Paramoecium
  - (3) Trypanosoma (4) Entamoeba

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

- (1) Some of the organisms can fix atmospheric nitrogen in specialised cells called sheath cells
- (2) Fusion of two cells is called Karyogamy
- (3) Fusion of protoplasms between two motile or non-motile gametes is called plasmogamy
- (4) Organisms that depend on living plants are called saprophytes
- **137.** Which of the following statements is **incorrect**?
  - (1) Morels and truffles are edible delicacies
  - (2) *Neurospora* is used extensively in biochemical and genetic work
  - (3) Conidia are produced exogenously and ascospores endogenously
  - (4) Yeasts have filamentous bodies with long thread-like hyphae
- **138.** The imperfect fungi which are decomposers of litter and help in mineral cycling belong to
  - (1) Deuteromycetes (2) Basidiomycetes
  - (3) Phycomycetes (4) Ascomycetes
- **139.** After karyogamy followed by meiosis, spores are produced exogenously in
  - (1) Neurospora (2) Alternaria
  - (3) Saccharomyces (4) Agaricus
- **140.** Which of the following environmental conditions are essential for optimum growth of *Mucor* on a piece of bread?
  - (i) Temperature of about 25°C
  - (ii) Temperature of about 5°C
  - (iii) Relative humidity of about 5%
  - (iv) Relative humidity of about 95%
  - (v) A shady place
  - (vi) A brightly illuminated place
  - Choose the answer from the following options.
  - (1) (i), (iv) and (v) only (
  - (2) (ii), (iii) and (vi) only
  - $(3) \hspace{0.1in} (ii), (iv) \hspace{0.1in} and (v) \hspace{0.1in} only$
  - (4) (i), (iii) and (v) only

- 141. Which of the following is a correct statement?
  - (1) Bacteria are exclusively heterotrophic organisms
  - (2) Slime moulds are saprophytic organisms classified under kingdom-Monera
  - (3) Mycoplasma have DNA, Ribosome and cell wall
  - (4) Cyanobacteria are a group of autotrophic organisms classified under kingdom-Monera
- 142. Dinoflagellates have-
  - (1) A single flagellum in the transverse groove between the cell plates
  - (2) A single flagellum in the longitudinal groove between the cell plates
  - (3) Two flagella one lies longitudinally and the other transversely in a furrow between the wall plates
  - (4) No flagella
- 143. Match the organism in column-I with habitats in column-II

	Column-I		Column-II
(A)	Halophiles	Ι	Hot Springs
(B)	Thermoacidophiles	Π	Aquatic
			environment
(C)	Methanogens	III	Guts of
			ruminants
(D)	Cyanobacteria	IV	Salty areas

- (1) A-(IV), B-(I), C-(III), D-(II)
- (2) A-(IV), B-(I), C-(II), D-(III)
- (3) A-(II), B-(IV), C-(I), D-(III)
- (4) A-(III), B-(II), C-(IV), D-(I)
- **144.** Which of the following are likely to be present in deep sea water?
  - (1) Archaebacteria
  - (2) Eubacteria
  - (3) Blue-green algae
  - (4) Saprophytic fungi
- **145.** Genophore bacterial genome or nucleoid is made of
  - (1) histones and non-histones
  - (2) RNA and histones
  - (3) a single double-stranded DNA
  - (4) a single-stranded DNA

### 146. Select the incorrect statement.

- (1) The walls of diatoms are easily destructible
- (2) Diatomaceous earth is formed by the cell walls of diatoms
- (3) Diatoms are chief producers in the oceans
- (4) Diatoms are microscopic and float passively in water

- **147.** In which group of organisms the cell walls form two thin overlapping shells which fit together?
  - (1) Chrysophytes
  - (2) Euglenoids
  - (3) Dinoflagellates
  - (4) Slime moulds

**148.** Which of the following is wrong for fungi?

- (1) They are eukaryotic
- (2) All fungi possess a purely cellulosic cell wall
- (3) They are heterotrophic
- (4) They are both unicellular and multicellular

### Section A

- **151.** Find the correct descending order of percentage proportion of leucocyte in human blood
  - (1) Neutrophils → Basophils → Lymphocytes
     → Eosinophils → Monocytes
  - Monocytes → Neutrophils → Lymphocytes
     → Eosinophils → Basophils
  - (3) Neutrophils → Lymphocytes → Monocytes
     → Eosinophils → Basophils
  - (4) Lymphocytes → Eosinophils → Basophils
     → Neutrophils → Monocytes
- **152.** Read the following statement and state True/(T) and False (F) for statement
  - (A) Blood is the most commonly used body fluid by most the higher organism including humans
  - (B) Plasma is a Red colour fluid
  - (C) Plasma without the clotting factors is called serum.

	А	В	С
(1)	F	Т	Т
(2)	Т	F	Т
(3)	F	F	Т
(4)	Т	Т	F

153. Wheezing sound is produced in

(1) A	Asthma	(2)	Emphysema
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- (3) Silicosis (4) Pneumonia
- **154.** Match column I and II and choose the correct option

	Column-I		Column -II
A)	Fishes	i)	3 chambered
B)	Amphibian	ii)	4 chambered
C)	Reptiles	iii)	1 chambered
D)	Birds	iv)	2 chambered
E)	Mammals		
F)	Crocodile		
(1)	(A), (B)	(iii)	
(2)	(B), (C)	(ii)	
(3)	(D), (E), (F)	(ii)	

(4) (D), (E) (i)

- **149.** In the five-kingdom classification, *Chlamydomonas* and *Chlorella* have been included in
  - (1) Protista (2) Algae
  - (3) Plantae (4) Monera
- **150.** What is true for cyanobacteria?
  - (1) Oxygenic with nitrogenase
  - (2) Oxygenic without nitrogenase
  - (3) Non-oxygenic with nitrogenase
  - (4) Non-oxygenic without nitrogenase

# (ZOOLOGY)

- **155. Statement-I**: Emphysema is a chronic disorder **Statement-II**: One of the major cause of emphysema is cigarette smoking.
  - (1) Both statements are incorrect
  - (2) Both statement-I and statement-II are correct
  - (3) Statement-I is correct and statement-II is incorrect
  - (4) Statement -I is incorrect and statement-II is correct
- **156.** Which one of the following is correct?
  - (1) Plasma = Blood Lymphocyte
  - (2) Serum = Blood + Fibrinogen
  - (3) Lymph = Plasma + RBC + WBC
  - (4) Blood = Plasma + RBC + WBC + Platelets
- **157.** Read the following statement and choose the correct one w.r.t to Erythrocyte
  - (i) A healthy adult man has on an average 5 million to 5.5 million of RBC mm<sup>-3</sup> of blood
  - (ii) RBC are devoid of nucleus in most of the mammals and are biconvex in shape
  - (iii) RBCs have an average life span of 120 days
  - (iv) RBC are formed in lungs
  - (1) Only (i), (iii)
  - (2) Only (i), (ii)
  - (3) Only (i), (ii), (iii)
  - (4) All of the above
- **158.** Which one of the following plasma proteins is involved in the coagulation of blood
  - (1) Serum (2) Globulin
  - (3) Fibrinogen (4) Albumin
- 159. Lymph is known as
  - (1) Tissue fluid
  - (2) Interstitial fluid
  - (3) Plasma
  - (4) Both (1) and (2)

- **160.** Which one of the following blood cells is involved in generating immune response of the body
  - (1) B-Lymphocyte (2) T-Lymphocyte
  - (3) Thrombocyte (4) Both (1) and (2)
- **161.** In human which of the following is not a step in respiration?
  - (1) Alveolar diffusion of  $O_2$  and  $CO_2$
  - (2) Transport of gases by blood
  - (3) Diffusion of O<sub>2</sub> and CO<sub>2</sub> between blood and tissues
  - (4) Utilisation of CO<sub>2</sub> by cells for catabolic reaction
- 162. Tidal volume is
  - (1) Volume of air inspired or expired during a normal respiration/Breathing
  - (2) Additional volume of air a person can inspire by a forcible inspiration
  - (3) Additional volume of air a person can expire by a forcible expiration
  - (4) Remaining volume of air in the lungs even after a forcible expiration
- **163.** The structure which does not contribute to the breathing movement in mammals is
  - (1) Larynx (2) Ribs
  - (3) Diaphragm (4) Intercostal muscle
- **164.** Which of the following statement is incorrect?
  - (1) Respiratory rhythm is maintained by the respiratory centre in the medulla region.
  - (2) Cells utilise oxygen for metabolism and produce energy along with substance like  $CO_2$  which is not a harmful.
  - (3) The role of oxygen in the regulation of respiratory rhythm is quite insignificant
  - (4) Every 100 ml of deoxygenated blood deliver approximately 4 ml of CO<sub>2</sub> to the alveoli
- **165.** Factors affecting the rate of diffusion is/are.
  - (1) Pressure gradient
  - (2) Solubility of gases
  - (3) Thickness of membrane
  - (4) All of the above
- **166.** Choose the correct option for A and B to complete the given data

Presence of	Systemic Voing	Systemic Arteria
gases	venis	Attenes
O <sub>2</sub>	40 mm Hg	95 mm Hg
CO <sub>2</sub>	А	В
(1) A-45 mm H	Ig B-40	mm Hg
(2) A-45 mm H	Ig B-45	mm Hg
(3) A-45 mm H	Ig B-55	mm Hg
(4) A-45 mm H	Ig B-50	mm Hg

- **167.** Partial pressure of  $O_2$  and  $CO_2$  in atmospheric air as compared to that in alveolar sir is
  - PO<sub>2</sub> PCO<sub>2</sub>
  - (1) Higher Lower(2) Higher Higher(3) Lower Lower
  - (4) Lower Higher
- 168. Almost same PCO<sub>2</sub> in humans is found in
  - (1) Oxygenated blood and tissues
  - (2) Deoxygenated blood and oxygenated blood
  - (3) Deoxygenated blood and tissue
  - (4) All of the above
- **169.** Which one of the following are the correct matching of respiratory capacities and respiratory volumes?

	Column -I	Column-II		
Res	Respiratory capacity		spiratory volume	
А.	Residual	1.	3000 mL	
	volume			
В.	Vital capacity	2.	3500 mL	
C.	Inspiratory	3.	1200 mL	
	reserve volume			
D.	Inspiratory	4.	4600 mL	
	capacity			

	Α	В	С	D
(1)	4	3	2	1
(2)	1	2	3	4
(3)	3	4	1	2
(4)	2	1	4	3

**170.** A. It is double layered and cover the lungs.

- B. Fluid between the layers reduce friction on the lung surface.
- C. Outer layer is in contact with thoracic wall
- D. Inner layer is in contact with lungs
- The above features refer to
- (1) Pericardium (2) Peritoneum
- (3) Pleura (4) All of the above
- 171. Dub heart sound comes during
  - (1) Late Atrial systole
  - (2) Early Ventricular systole
  - (3) Early joint diastole
  - (4) Late joint Diastole
- **172.** Binding of  $O_2$  with Haemoglobin is primarily related to
  - (1) PCO<sub>2</sub>
  - (2) PO<sub>2</sub>
  - (3) H+ concentration
  - (4) Temperature

- **173.** During swallowing glottis can be covered by a thin elastic cartilaginous flap called <u>A</u> to prevent the entry of food into the <u>B</u>.
  - (1) (A) Epiglottis (B) Nose
  - (2) (A) Nose (B) Glottis
  - (3) (A) Epiglottis (B) Laryx
  - (4) All of the above
- **174.** Erythroblastosis foetalis occurs when a factor from mother passes into the foetus through the placenta, the factor is
  - (1) Rh antigen
  - (2) Rh antibodies
  - (3) Albumin
  - (4) Plasma
- **175.** Which of the following disorder caused by the long exposure of grinding or stone breaking lead to inflammation leading to fibrosis and cause serious lung damage
  - (1) Bronchitis
  - (2) Asthma
  - (3) Occupational respiratory disorder
  - (4) Emphysema
- **176.** Which of the following statement are true w.r.t. to mechanism of breathing?
  - (i) Breathing involves two stages inspiration and expiration
  - (ii) We have the ability to increase the strength of inspiration and expiration with the help of chest muscle
  - (iii) A healthy human breaths 12-16 times/minute
  - (iv) Spirometer helps in clinical assessment of pulmonary functions
  - (1) Only (i) (2) only (i), (iii), (iv)
  - (3) Only (ii) (4) Only (iii) (iv)
- **177.** The lung of human comprises
  - (1) Bronchi (2) Bronchiole
  - (3) Alveoli (4) All of the above
- **178.** Movement of the air into and out of the lungs is carried out by
  - (1) Imbibition (2) Pressure gradient
  - (3) Osmosis (4) Diffusion
- **179.** Decreased intrapulmonary pressure during inspiration is caused due to
  - (1) Increased pulmonary volume and thoracic volume
  - (2) Contraction of intercostal muscle
  - (3) Upliftment of Ribs and Sternum
  - (4) All of the above

- **180.** Approximate volume of air a healthy man can inspirs or expire per minute is
  - (1) 5000 to 6000 mL
  - (2) 6000 to 7000 mL
  - (3) 6000 to 8000 mL
  - (4) 7000 to 9000 mL
- **181.** Receptors in aortic arch and carotic arch recognise the changes in the concentration of
  - (1)  $OH^-$  and  $H^+$  (2)  $O_2$  and  $CO_2$
  - (3)  $CO_2$  and  $H^+$  (4) Blood circulation
- **182.** Assertion:- Mammals perform negative pressure breathing.

**Reason:** Using muscular movement mammals create a pressure gradient so that they can perform inspiration and expiration

- (1) If both assertion and Reason are correct and reason is the correct explanation of Assertion
- (2) If both assertion and reason are true but the reason is not a correct explanation of assertion
- (3) If the assertion is true but the reason is false
- (4) If both the assertion and reason are false.
- **183.** An iron containing respiratory pigment in human blood is
  - (1) Myoglobin (2) Haemoglobin
  - (3) Haem-erythrin (4) Haemocyanin
- **184.** Which of the following option describes all the components of human blood group?
  - (1) A and B Blood group
  - $(2) \quad AB \text{ and } O \text{ Blood group}$
  - (3) Rh and ABO Blood group
  - (4) Rh and AB Blood group
- 185. Platelets are
  - (1) Also called thrombocytes
  - (2) Cell fragments
  - (3) Produced from megakaryocytes
  - (4) All of the above

#### Section B

**186.** Which of the following statements are true/false

- I. The blood transports CO<sub>2</sub> comparatively easily due to its high solubility.
- II. Approximately 8.9% of CO<sub>2</sub> is transported being dissolved in the plasma of blood
- III. Haemoglobin is a white coloured iron containing pigment

	True	False
(1)	I, II	III, IV
(2)	I, IV	II, III
(3)	I, III	II, IV
(4)	I. II. III	IV

- **187.** Read the following statement
  - I. The intrapulmonary pressure is less than the atmospheric pressure
  - II. Increased thoracic volume and pulmonary volume

In which of the above two situations inspiration takes place?

Choose the correct option accordingly.

- (1) Only I (2) Only II
- (3) I and II (4) II and I
- **188.** What will happen if a  $Rh^{+ve}$  persons blood is exposed to the  $Rh^{-ve}$  person?
  - (1) Antigen formation takes place
  - (2) Negative and positive Rh antigen cancel out each other
  - (3) Nothing will happen
  - (4) Antibody will be produced
- **189.** Which of the following statement is incorrect w.r.t to human heart?
  - (1) Heart is the mesodermally derived organ.
  - (2) The entire heart is made of cardiac muscle
  - (3) The walls of ventricles are thinner than that of atria
  - (4) The valves in the heart allows the flow of blood only in one direction
- **190.** Assertion: Closed circulatory system is more advantageous

**Reason:** In this the flow of fluid can be more precisely regulated

- (1) If both the assertion and the reason are true and the reason is a correct explanation of the assertion
- (2) If both the assertion and reason are true and reason is not a correct explanation of assertion
- (3) If Assertion is true and Reason is false
- (4) Both Assertion and Reason are false.
- **191.** Which part of heart is responsible for initiating and maintaining its rhythmic activity
  - (1) SA Node (2) NA Node
  - (3) Ventricle (4) Atrial
- **192.** What would be the cardiac output of a person having heart rate is 74 beats per minute and a stroke volume of 50 mL
  - (1) 3700 mL
  - (2) 360 mL
  - (3) 7200 mL
  - (4) 5000 mL

- **193.** Tricuspid valve is present between the:
  - (1) Right atrium and right ventricle
  - (2) Right atrium and left ventricle
  - (3) Left atrium and left ventricle
  - (4) Right ventricle and left atrium
- **194.** Which of the following statement is incorrect?
  - (1) ABO grouping is based on the presence or absence of two surface antigens
  - (2) Person with AB group can accept blood from persons with AB as well as the other groups of blood so AB blood group is called universal recepient
  - (3) In a person with Blood group A antigen A is present in the plasma
  - (4) In AB blood group antibodies in plasma are absent
- **195.** Ventricular \_\_\_\_A\_\_\_\_ increased the ventricular pressure causing the \_\_\_\_B\_\_\_\_ of tricuspid and Bicuspid valve due to attempted back flow of blood into the atria.
  - (1) (A) Diastole (B) Open
  - (2) (A) Systole (B) Closure
  - (3) (A) Open (B) Diastole
  - (4) All of the above
- 196. The second heart sound dub is associated with
  - (1) Closure of Bicuspid and tricuspid valve
  - (2) Closure of semilunar valve
  - (3) Closure of atrioventricular valve
  - (4) All of the above

#### **197.** Match the following columns

	Col	umn I		Column II
A.	Eart	hworm	1.	Moist cuticle
B.	Terr	restrial	2.	Gills
	Arth	ropods		
C.	Fishes		3.	Lungs
D.	Birds/reptiles		4.	Trachea
	Α	В	С	D
(1)	2	1	4	3
(2)	1	4	2	3
(3)	1	3	2	4
(4)	1	2	4	3

- **198.** The total thickness of the diffusion membrane of alveolus capillary is
  - (1) Less than 1 cm
  - (2) Less than 2 cm
  - (3) Less than 1 mm
  - (4) More than 1 mm

- 199. What percentage of O<sub>2</sub> is transported by RBC and plasma respectively in human body?
  (1) 50, 50
  (2) 97, 3
  - (3) 90, 10 (4) 80, 20

- **200.** Clotting disorder occur mainly due to the reduction in the number of
  - (1) Granulocytes (2) RBC
  - (3) WBC (4) Platelets

# Solution

104. (4)

All of the above are the features of the members of class phycomycetes. NCERT 11, Page No. 17

### 105. (3)

Cell cycle completes in two steps, i.e. interphase and M-phase. D-synthetic phase. NCERT 11, Page No. 121

### 106. (2)

In S-phase of interphase centriole duplication occurs. NCERT 11, Page No. 121

## 107. (2)

DNA replication occurs during S-phase of the mitotic cycle in the somatic cell where it gets doubled as compared to that in the original cell. NCERT 11, Page No. 121-122

## **108.** (1)

Statement in option (1) is incorrect with reference to mitosis because spindle fibres attach to kinetochores of chromosomes in metaphase. NCERT 11, Page No. 122-124

## 109. (2)

During mitosis following events occurs as follows

Condensation of chromosomal material, which takes place at an early prophase stage. During late prophase nuclear membrane disintegrates. Then chromosomes get arranged at equator in the metaphase stage. After that splitting of centromere and segregation of chromosomes occur in the anaphase stage. In telophase stage chromosomes move to opposite poles of the cell. It is the last stage of mitosis.

NCERT 11, Page No. 122-124

## 110. (1)

The given figure is telophase stage. Telophase is reverse of prophase. The chromosome that have reached their respective poles decondense, i.e. nuclear envelop reforms, Golgi complex reforms, etc.

NCERT 11, Page No. 122-124

## 111. (2)

During meiosis I in human, one of the daughter cell receives a mixture of maternal and paternal chromosomes.

NCERT 11, Page No. 126-127

## 112. (4)

They come from both parents and take part in meiosis-I. NCERT 11, Page No. 126-127

### 113. (3)

N, 3N, 5N have odd number of ploidy so can't show meiosis. NCERT 11, Page No. 125-128

### 114. (2)

The above events indicate diakinesis stage. NCERT 11, Page No. 126-127

## 115. (2)

In S, phase DNA content doubles but number of chromosomes remain same. NCERT 11, Page No. 121

### 116. (4)

Non-dividing cells like heart cells, neuron are in  $G_0$  phase. NCERT 11, Page No. 122

### 117. (2)

DNA replication – Interphase breakdown of nuclear membrane – prophase Division of centromere – Anaphase NCERT 11, Page No. 121-124

## **118.** (1)

Both statements are correct. NCERT 11, Page No. 124-125

## 119. (1)

Both assertion and reason are true and reason is a correct explanation of assertion. NCERT 11, Page No. 121

## 120. (1)

Both statements are correct. NCERT 11, Page No. 121, 127

## 121. (3)

In pachytene stage of prophase-I of meiosis, there is breakage and reunion of chromatids, it results in exchange of segments between non- sister chromatids of a bivalent, known as crossing over. It leads to recombination of linked genes/alleles and is a major source of continuous type of genetic variations in sexually reproducing organisms.

NCERT 11, Page No. 126

122. (4)

Recombination takes place in meiosis but still Meiosis maintains the chromosome number constant. It produces haploid gametes by reducing the chromosome number to half. Crossing over produces new combination of linked genes and is major source of genetic variation.

NCERT 11, Page No. 128

#### 123. (2)

The statement in option (2) best explain the evolutionary advantage of meiosis. NCERT 11, Page No. 128

#### 124. (1)

Archaebacteria differ from other bacteria in having a different cell wall structure and this feature is responsible for their survival in extreme conditions. NCERT 11, Page No. 13

#### 125. (1)

Euglenoids are flagellates. NCERT 11, Page No. 15

### 126. (2)

Statement in option (2) is incorrect and can be corrected as Cyanobacteria or blue-green algae are photosynthetic organisms which perform oxygenic photosynthesis. They have the ability of nitrogen fixation due to the presence of large pale cells called heterocyst in their filaments. NCERT 11, Page No. 13

#### 127. (3)

Mycoplasma is the triple layered smallest living cell. It does not have definite cell wall. NCERT 11, Page No. 14

#### 128. (1)

Both statements are correct. NCERT 11, Page No. 12-13

#### 129. (4)

Nostoc is a prokaryote. The Prokaryotic cells lack membrane bound organelles and well organised nucleus, i.e. nuclear envelope is absent. Penicillium, Agaricus and Puccinia are

eukaryotic organisms. NCERT 11, Page No. 13

#### 130. (4)

Statement (i), (ii) and (iv) are correct. The incorrect statement (iii) can be corrected as Chemosynthetic autotrophic bacteria oxidise various inorganic substances such as nitrates, nitrites and ammonia and use the released energy for their ATP production. NCERT 11, Page No. 12-14

#### 131. (1)

Both assertion and reason are true and reason is a correct explanation of the assertion. NCERT 11, Page No. 12-13

#### 132. (1)

Both statements are correct. NCERT 11, Page No. 11, 14

#### 133. (3)

Spirogyra cannot fix atmospheric nitrogen. It is a member of green algae. Only Nostoc and Anabaena (Blue-green algae) and Azotobacter (bacteria) can fix nitrogen. NCERT 11, Page No. 14-15

### 134. (4)

Ciliates differ from all other protozoans in having thousands of cilia. NCERT 11, Page No. 15-16

### 135. (3)

The disease African sleeping sickness is caused by Trypanosoma gambiense and this is transmitted by tse-tse fly (Glossina palpalis). NCERT 11, Page No. 16

#### 136. (3)

Statement in option (3) is correct. NCERT 11, Page No. 15, 16, 17

#### 137. (4)

Statement in option (4) is incorrect. It can be corrected as Yeast is an unicellular sac fungi. It lacks filamentous structure or hyphae. NCERT 11, Page No. 17-18

#### 138. (1)

The imperfect fungi which are decomposers of litter and help in mineral cycling belong to Deuteromycetes.

NCERT 11, Page No. 18

139. (4)

Spore are produced exogenously in *Agaricus* (a genus of basidiomycetes).

Exogenous spore formation takes place outside the body in specialised fruiting bodies. The fruiting body of *Agaricus* is basidiocarp. NCERT 11, Page No. 17-18

### 140. (1)

*Mucor* shows the best growth on a piece of bread at a temperature of about 25°C, relative humidity of about 95% in a moist and shady place. NCERT 11, Page No. 16-17

## 141. (4)

Statement in option (4) is correct. Cyanobacteria or blue-green algae are Gram positive autotrophic prokaryotes which perform oxygenic photosynthesis. Cyanobacteria are classified under kingdom-Monera. NCERT 11, Page No. 13, 14, 15

## 142. (3)

Dinoflagellates have two flagella one lies longitudinally and the other transversely in a furrow between the wall plates. NCERT 11, Page No. 15

## 143. (1)

A-(IV), B-(I), C-(III), D-(II) NCERT 11, Page No. 13

## 144. (1)

Archaebacteria has the ability to survive in extreme environmental conditions, so they can flourish in hot springs and deep sea hydrothermal vents.

NCERT 11, Page No. 13

## 145. (3)

In bacteria, nucleoid or genophore is haploid and consists of single, naked, double stranded, circular ring like highly folded supercoiled DNA with no free ends and no histone proteins. NCERT 11, Page No. 14

## 151. (3)

[NCERT 11<sup>th</sup> Pg No. 279]

Neutrophils most abundant then Lymphocyte than monocyte than eosinophils Basophils are least abundant cells.

## 152. (2)

[NCERT 11<sup>th</sup> Pg No. 278] Plasma is a straw colour viscous fluid

### 153. (1)

[NCERT 11<sup>th</sup> Pg No. 275]

## 146. (1)

The statement in option (1) is incorrect and can be corrected as Diatoms are single celled plant like protists that produce intricately structured cell walls made of nano(-) silica (SiO<sub>2</sub>). Thus, the walls are indestructible. NCERT 11, Page No. 14

## 147. (1)

Chrysophytes are placed under the kingdom-Protista. This group includes diatoms and golden algae (desmids). Most of them are photosynthetic. In diatoms, the cell walls form two thin overlapping cells, which fit together as in a soap box.

NCERT 11, Page No. 14

## 148. (2)

Statement in option (2) is wrong for fungi. It can be corrected as, In fungi, cell wall contains chitin or cellulose along with other polysaccharides, proteins and lipids. Only in some fungi, e.g. *Phytophthora* or other oomycetes a purely cellulosic cell wall is present. NCERT 11, Page No. 16-17

## 149. (1)

*Chlamydomonas* and *Chlorella* are included in kingdom-Protista as they are unicellular, eukaryotic organisms.

The five kingdom classification system has brought together *Chlamydomonas, Chlorella and Amoeba* in kingdom protista. NCERT 11, Page No. 12

## 150. (1)

Cyanobacteria also known as blue-green algae is a very important group of photosynthetic bacteria in the history of life on earth. Cyanobacteria are oxygenic and have enzyme nitrogenase for nitrogen fixation.

NCERT 11, Page No. 13

# (ZOOLOGY) Wheezing sound i

Wheezing sound is produced in disease asthma because of inflammation of bronchi and bronchioles

### 154. (3)

[NCERT 11 <sup>th</sup> Pg No. 282]				
Fishes	$\rightarrow$	2 Chambered heart		
Amphibians	$\rightarrow$	3 Chambered		
Reptiles	$\rightarrow$	3 Chambered		
Birds	$\rightarrow$	4 Chambered		
Mammals	$\rightarrow$	4 Chambered		
Crocodile	$\rightarrow$	4 Chambered		

155.	(2) [NCERT 11 <sup>th</sup> Pg No. 275] Emphysema is a chronic disorder in which alveolar walls are damaged due to which respiratory surface is decrease	165.	<ul> <li>(4)</li> <li>[NCERT 11<sup>th</sup> Pg No. 272]</li> <li>Solubility of gases thickness of membrane and pressure gradient affects the rate of diffusion</li> <li>(1)</li> </ul>
156.	(4) [NCERT 11 <sup>th</sup> Pg No. 279, 280, 282] Blood = Plasma + formed element (RBC +WBC +	100.	(I) [NCERT 11 <sup>th</sup> Pg No. 272] Systemic veins – 45 mm Hg Systemic arteries – 40 mm Hg
	platelets) Serum is without clotting factor fluid	167.	(1) [NCERT 11 <sup>th</sup> Pg No. 272]
157.	(1) [NCERT 11 <sup>th</sup> Pg No. 279]		$PO_2$ is Lower
	RBC are devoid of nucleus in most of the mammals are biconcave in shape RBCs are formed in Red bone marrow.	168.	<ul> <li>(1)</li> <li>[NCERT 11<sup>th</sup> Pg No. 272]</li> <li>Almost same PCO<sub>2</sub> in humans is found in Deoxygenated blood and tissues.</li> </ul>
158.	(3) [NCERT 11 <sup>th</sup> Pg No. 279] Fibrinogen $\rightarrow$ Clotting or coagulation of blood Globulin $\rightarrow$ For defence mechanism Albumin $\rightarrow$ osmotic balance	169.	(3) [NCERT 11 <sup>th</sup> Pg No. 272] Residual volume = 1200 mL Vital capacity = ERV + TV + IRV = 1100 +500 +300
159.	(4) Lymph is known as a tissue fluid and interstitial fluid [NCERT 11 <sup>th</sup> Pg No. 282]		= $4600 \text{ mL}$ IRV = $3000 \text{ mL}$ IC = TV + IRV = $500 + 3000$ = $3500 \text{ mL}$
160.	<ul> <li>(4)</li> <li>[NCERT 11<sup>th</sup> Pg No. 280]</li> <li>B-Lymphocyte and T-Lymphocyte are involved in generating immune response of the body</li> </ul>	170.	(3) [NCERT 11 <sup>th</sup> Pg No. 275] Pleura is a double layered structure. Pleural fluid is found in pleura.
161.	(4) [NCERT 11 <sup>th</sup> Pg No. 270] Utilisation of O <sub>2</sub> by the cells for catabolic reaction and resultant release of CO <sub>2</sub>	171.	(3) [NCERT 11 <sup>th</sup> Pg No. 284] Dub, heart sound comes when semilunar value is closed
162.	(1) [NCERT 11 <sup>th</sup> Pg No. 271] Volume of air inspired or expired during a normal respiration is tidal volume.	172.	(2) [NCERT 11 <sup>th</sup> Pg No. 274] Binding of O2 with Hb is primarily related to partial pressure of O <sub>2</sub>
163.	(1) [NCERT 11 <sup>th</sup> Pg No. 269] Larynx is a voice box not contribute in breathing movement	173.	(3) [NCERT 11 <sup>th</sup> Pg No. 269] During swallowing glottis can be covered by a thin elastic cartilaginous flap called epiglottis to prevent the entry of food into the larynx
164.	( <b>2</b> ) [NCERT 11 <sup>th</sup> Pg No. 276]	174.	(2) [NCERT 11 <sup>th</sup> Pg No. 281]

Cells utilise oxygen for metabolism and produce energy along with substance like  $CO_2$  which is a harmful. Erythroblastosis foetal is occurs when a Rh factor that is Rh antibodies mother passes into the foetus through the placenta.

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175. (3) 185. (4) [NCERT 11<sup>th</sup> Pg No. 276] [NCERT 11<sup>th</sup> Pg No. 274] Occupational lung disorder caused by the long Platelets are cell fragments produced from exposure of grinding or stone breaking megakaryocyte also called thrombocytes 176. (2) 186. (2) [NCERT 11<sup>th</sup> Pg No. 271] [NCERT 11<sup>th</sup> Pg No. 280] We have the ability to increase the strength of Haemoglobin is a red coloured iron containing inspiration and expiration with the help of pigment Abdominal muscle About 7% of CO2 is carried in a dissolved state through plasma 177. (4) [NCERT 11<sup>th</sup> Pg No. 269] 187. (3) The lung of human comprises Bronchi, Bronchiole [NCERT 11th Pg No. 270] and alveoli. Textual based question 178. (2) [NCERT 11<sup>th</sup> Pg No. 271] 188. (3) Movement of the air into and out of the lungs is [NCERT 11<sup>th</sup> Pg No. 281] carried out by pressure gradient If Rh<sup>-ve</sup> person blood exposed with Rh+ person antibody will be produced. But If Rh+ve exposed 179. (4) with Rh<sup>-ve</sup> nothing will happen [NCERT 11<sup>th</sup> Pg No. 270-271] Decrease intrapulmonary pressure during 189. (3) inspiration is caused due to increased pulmonary [NCERT 11<sup>th</sup> Pg No. 283] volume and thoracic volume contraction of The walls of ventricle is thicker than that of atria intercostal muscle and upliftment of Ribs and sternum. 190. (1) [NCERT 11<sup>th</sup> Pg No. 282] 180. (3) Closed circulatory system is more advantageous [NCERT 11<sup>th</sup> Pg No. 270-271] because in this flow of fluid can be more precisely Approximate 6000 to 8000 mL air a healthy man regulated can inspire or expire per minute 181. (3) **191.** (1) [NCERT 11<sup>th</sup> Pg No. 275] [NCERT 11<sup>th</sup> Pg No. 284] Receptors in aortic arch and carotic arch recognise SA node is responsible for initiating and the changes in the concentration of CO<sub>2</sub> ant H<sup>+</sup> maintaining rhythmic activity of heart 182. (1) 192. (1) [NCERT 11<sup>th</sup> Pg No. 270] [NCERT 11<sup>th</sup> Pg No. 285] Mammals perform negative pressure breathing  $C.O. = S.V. \times H.R.$ because using muscular movement mammals create  $= 50 \times 74$ a pressure gradient so that they can perform

= 3700 ml

## **193.** (1)

[NCERT 11<sup>th</sup> Pg No. 283] Tricuspid value is present between Right atrium and Right ventricle

## **194.** (3)

[NCERT 11<sup>th</sup> Pg No. 280] AB  $\rightarrow$  universal recipient antigen A is present on RBC in blood Group A

# 183. (2)

respiration

[NCERT 11<sup>th</sup> Pg No. 274] Haemoglobin is iron containing respiratory pigment present in human blood

# 184. (3)

[NCERT 11<sup>th</sup> Pg No. 280-281] Rh and ABO blood groups are the whole component of Human blood

### 195. (2)

[NCERT 11<sup>th</sup> Pg No. 285] Ventricular systole increases the ventricular pressure causing the closure of tricuspid and Bicuspid value.

## 196. (2)

[NCERT 11<sup>th</sup> Pg No. 285] The second heart sound is associated with closure of semilunar value

## **197.** (2)

[NCERT 11<sup>th</sup> Pg No. 268] Earthworm  $\rightarrow$  Moist cuticle Terrestrial arthropods $\rightarrow$  Trachea Fishes $\rightarrow$  Gills Birds/reptiles  $\rightarrow$  Lungs

## **198.** (3)

[NCERT 11<sup>th</sup> Pg No. 273] Total thickness of alveolar membrane is less than 1 mm.

## **199.** (2)

[NCERT 11<sup>th</sup> Pg No. 274] O2 transport by RBC  $\rightarrow$  97% plasma 3%

## 200. (4)

[NCERT 11<sup>th</sup> Pg No. 280] Due to decrease number of platelets clotting disorder occur