SAINIK SCHOOL CHANDRAPUR
CLASS –XI BIOLOGY
SUMMER VACATION WORK-(2023-2024)

MCQs ON BODY FLUIDS AND CIRCULATION

1. **In the human body, which of the following organs is the blood bank?**
   (a) Heart
   (b) Lungs
   (c) Spleen
   (d) Liver
   .
2. **What is a matching pair of a certain body feature and its value/count in a normal adult human?**
   (a) Urea 5-10 mg / 100 ml of blood
   (b) Blood sugar (fasting) – 70-100 mg/100 ml
   (c) Total blood volume – 5-6
   (d) ESR in Wintrobe method – 9-15 mm in males and 20-34 mm in females
   .
3. **Bulk of carbon dioxide (CO_2) released from body tissues into the blood is present as?**
   (a) 70% carbamino-haemoglobin and 30% as bicarbonate
   (b) carbamino-haemoglobin in RBCs
   (c) bicarbonate in blood plasma and RBCs
   (d) free CO_2 in blood plasma
   .
4. **A cardiac pacemaker fails to function normally in a patient. A pacemaker is to be grafted into him by the doctors. The graft will likely be placed at the site of?**
   (a) Atrioventricular bundle
   (b) Purkinje system
   (c) Sinuatrial node
   (d) Atrioventricular node
   .
5. **A marriage between what types of man and woman would lead to child death?**
   (a) Rh+ man and Rh+ woman
   (b) Rh+ man and Rh– woman
   (c) Rh– man and Rh– woman
   (d) Rh– man and Rh+ woman
   .
6. **Fat and calcium deposition in the arteries causes a blockage called?**
   (a) Arteriosclerosis
   (b) Atherosclerosis
   (c) Emphysema
   (d) Heart syndrome

.

7. **Which one of the following doctors performed the first heart transplant?**
   (a) Hargovind Khurana
   (b) Christian Barnard
   (c) Watson
   (d) William Harvey
   .

8. **What is QRST related to?**
   (a) Ventricular contraction or depolarization
   (b) Auricular contraction
   (c) Auricular relaxation
   (d) Cardiac cycle
   .

9. **To prevent excessive rises in blood pressure, a person with high blood pressure should take which of the following precautions?**
   (a) sleep as much as possible
   (b) avoid standing
   (c) increase their weight
   (d) avoid emotional disturbances and excitement
   .

10. **What would be the condition of people who have migrated from the planes to an area adjoining Rohtang Pass about six months back?**
    (a) have more RBCs and their haemoglobin has a lower binding affinity to O2.
    (b) are not physically fit to play games like football.
    (c) suffer from altitude sickness with symptoms like nausea, fatigue, etc.
    (d) have the usual RBC count but their haemoglobin has a very high binding affinity to O2.
    .

11. **In humans, what is true about RBCs?**
    (a) They carry about 20–25 per cent of CO2
    (b) They transport 99.5 per cent of O2
    (c) They transport about 80 per cent of oxygen only and the rest 20 per cent of it is transported in dissolved state in blood plasma
    (d) They do not carry CO2 at all
    .

12. **What will be the immediate effect if the chordae tendineae of the tricuspid valve of the human heart is partially non – functional due to some injury?**
    (a) The flow of blood into the aorta will be slowed down
    (b) The ‘pacemaker’ will stop working
    (c) The blood will tend to flow back into the left atrium
    (d) The flow of blood into the pulmonary artery will be reduced
    .

13. **ABO blood groups in humans are controlled by the gene I. It has three alleles – IA IB and i. Since there are three different alleles, six different genotypes are possible. How many phenotypes can occur?**
    (a) Three

(b) One
(c) Four
(d) Two
.

14. **Human blood plasma contains globulins that are primarily involved in what?**
(a) osmotic balance of body fluids
(b) oxygen transport in the blood
(c) clotting of blood
(d) defence mechanisms of the body
.

15. **Which of the following alphabets represents the respective human heart's activity in a standard ECG?**
(a) S – start of systole
(b) T – end of diastole
(c) P – depolarisation of the atria
(d) R – repolarisation of ventricles
.

16. **ECG depicts the depolarisation and repolarisation processes during the cardiac cycle. In the ECG of a normal healthy individual, which one of the following waves is not represented?**
(a) Depolarisation of atria
(b) Repolarisation of atria
(c) Depolarisation of ventricles
(d) Repolarisation of ventricles
.

17. **What type of cell lacks a nucleus?**
(a) RBC
(b) Neutrophils
(c) Eosinophils
(d) Erythrocytes
.

18. **Antibodies are produced by which of the following blood cells?**
(a) B-lymphocytes
(b) T-lymphocytes
(c) RBC
(d) neutrophils
.

19. **Which agranulocytes are responsible for the immune response of the body?**
(a) basophils
(b) neutrophils
(c) eosinophils
(d) lymphocytes
.

20. **The second heart sounds (dubb) are associated with the closure of?**
(a) tricuspid valve
(b) semilunar valve

(c) bicuspid valve
(d) tricuspid and bicuspid valve
.

21. **In a standard electrocardiogram, which of the following explains the phase/event in the cardiac cycle?**
(a) QRS complex indicates atrial contraction
(b) QRS complex indicates ventricular contraction
(c) Time between S and T represents atrial systole
(d) P-wave indicates the beginning of ventricular contraction
.

22. **Which of the following statements is incorrect?**
(a) A person of 'O' blood group has anti 'A' and anti 'B' antibodies in his blood plasma.
(b) A person of 'B' blood group can't donate blood to a person of 'A' blood group.
(c) Blood group is designated based on the presence of antibodies in the blood plasma.
(d) A person of AB blood group is a universal recipient.
.

23. **What would be the cardiac output of a person having 72 heartbeats per minute and a stroke volume of 50 mL?**
(a) 360 mL
(b) 3600 mL
(c) 7200 mL
(d) 5000 mL
.

24. **People with blood group AB are considered universal recipients because they have?**
(a) both A and B antigens on RBC but no antibodies in the plasma.
(b) both A and B antibodies are in the plasma.
(c) no antigen on RBC and no antibody in the plasma.
(d) both A and B antigens in the plasma but no antibodies.
.

25. **How do parasympathetic neural signals affect the working of the heart?**
(a) Reduce both heart rate and cardiac output.
(b) Heart rate is increased without affecting the cardiac output.
(c) Both heart rate and cardiac output increase.
(d) Heart rate decreases but cardiac output increases.
.

26. **Which one of the following is correct?**
(a) Serum = Blood + Fibrinogen
(b) Lymph = Plasma + RBC + WBC
(c) Blood = Plasma + RBC + WBC
(d) Plasma = Blood – Lymphocytes

.

27. **Where does erythropoiesis start?**
    (a) Liver
    (b) Spleen
    (c) Red bone marrow
    (d) Kidney
    .

28. **When is blood pressure in the mammalian aorta maximum?**
    (a) Diastole of the right ventricle
    (b) Systole of the left ventricle
    (c) Diastole of the right atrium
    (d) Systole of the left atrium
    .

29. **Doctors use a stethoscope to hear the sounds produced during each cardiac cycle. When is the second sound heard?**
    (a) Ventricular wall vibrates due to gushing in of blood from atria
    (b) Semilunar valves close down after the blood flows into vessels from ventricles
    (c) AV node receives a signal from SA node
    (d) AV valves open up
    .

30. **What animal has two separate circulatory pathways?**
    (a) Lizard
    (b) Whale
    (c) Shark
    (d) Frog
    .

31. **The blood pressure in the pulmonary artery is?**
    (a) same as that in the aorta.
    (b) more than that in the carotid.
    (c) more than that in the pulmonary vein.
    (d) less than that in the venae cavae.
    .

32. **Lymph is different from blood as it has?**
    (a) plasma without proteins
    (b) more WBCs and no RBCs
    (c) more RBCs and fewer WBCs
    (d) no plasma
    .

33. **The most popularly known blood grouping is the ABO grouping. It is named ABO and not ABC as the "O" in it refers to having?**
    (a) overdominance of this type on the genes for A and B types
    (b) one antibody only – either anti – A or anti- B on the RBC;
    (c) no antigens A and B on RBCs
    (d) other antigens besides A and B on RBCs

    .

34. **In humans, why does the blood passes from the post caval to the diastolic right atrium of the heart?**
    (a) open of the venous valves
    (b) suction pull
    (c) stimulation of the sino auricular node
    (d) the pressure difference between the post caval and atrium
    .

35. **In mammals, where do lymph vessels ultimately pour their contents?**
    (a) hepatic portal vein
    (b) artery entering into the spleen
    (c) anterior veins close to the right auricle
    (d) sciatic vein
    .

36. **Which of the following represents pulmonary circulation?**
    (a) In auricle (oxygenated blood) – lungs (deoxygenated blood) – Right auricle
    (b) Left auricle (deoxygenated blood) – lungs (oxygenated blood) – Right auricle
    (c) Left auricle (oxygenated blood) – lungs (deoxygenated blood) – Left auricle
    (d) Right auricle (deoxygenated blood) – lungs (oxygenated blood) – Left auricle
    .

37. **What does systemic heart refer to?**
    (a) the two ventricles together in humans
    (b) the heart that contracts under stimulation from the nervous system
    (c) left auricle and left ventricle in higher vertebrates
    (d) entire heart in lower vertebrates
    .

38. **Blood must be drawn from a patient and kept in a test tube for analysis of corpuscles and plasma. The following four types of test tubes are provided to you. Which one will you not use for this purpose?**
    (a) Test tube containing calcium bicarbonate
    (b) Chilled test-tube
    (c) Test tube containing heparin
    (d) Test tube containing sodium oxalate
    .

39. **Using the ABO blood group system, if both antigens are present but no antibody, what is the individual's blood group?**
    (a) B
    (b) O
    (c) AB
    (d) A
    .

40. **What is the true statement about lymph?**
    (a) WBC and serum
    (b) All components of blood except RBCs and some proteins
    (c) RBCs, WBCs and plasma
    (d) RBCs proteins and platelets
    .

41. **What is true about leucocytes?**
    (a) Their sudden fall in number is an indication of blood cancer
    (b) These are produced in the thymus
    (c) These are enucleated
    (d) These can squeeze out through the capillary walls
    .

42. **The pulmonary artery differs from the pulmonary vein in that it has?**
    (a) no endothelium
    (b) valves
    (c) large lumen
    (d) thick muscular walls
    .

43. **What is the most accurate statement about blood constituents and respiratory gas transport?**
    (a) RBCs transport oxygen whereas WBCs transport CO2
    (b) RBCs transport oxygen whereas plasma transports only CO2
    (c) RBCs as well as WBCs transport both oxygen and CO2
    (d) RBCs as well as plasma transport both oxygen and CO2
    .

44. **What is the purpose of lymph?**
    (a) transport oxygen to the brain
    (b) transport carbon dioxide to the lungs
    (c) return the interstitial fluid to the blood
    (d) return the WBCs and RBCs to the lymph nodes
    .

45. **Where is the enzyme carbonic anhydrase found?**
    (a) Lymphocytes
    (b) Blood plasma
    (c) RBC
    (d) Leucocytes
    .

46. **Which of the following statements is true about blood pressure?**
    (a) 130/90 mmHg is considered high and requires treatment
    (b) 100/55 mmHg is considered an ideal blood pressure
    (c) 105/50 mm Hg makes one very active
    (d) 90/110 mmHg may harm vital organs like the brain and kidney
    .

47. **What is the function of the vessels – arteries?**
    (a) supply oxygenated blood to the different organs
    (b) break up into capillaries which reunite to form one visceral organ
    (c) break up into capillaries which reunite to form a vein
    (d) carry blood from one visceral organ to another visceral organ
    .

48. **What plasma protein is involved in blood coagulation?**
    (a) an albumin
    (b) serum amylase

(c) a globulin
(d) fibrinogen
.

49. **In humans, the ‘Bundle of His’ is a part of which organ?**
(a) Brain
(b) Heart
(c) Kidney
(d) Pancreas
.

50. **What are the most active phagocytic white blood cells?**
(a) neutrophils and eosinophils
(b) lymphocytes and macrophages
(c) eosinophils and lymphocytes
(d) neutrophils and monocytes
.

51. **Histamine and the natural anti-coagulant heparin are released by what type of white blood cells?**
(a) Neutrophils
(b) Basophils
(c) Eosinophils
(d) Monocytes
.

52. **A drop of each of the following, is placed on four slides separately. Which one will not coagulate?**
(a) Blood serum
(b) Sample from the thoracic duct of the lymphatic system
(c) Whole blood from the pulmonary vein
(d) Blood plasma
.

53. **Examination of the blood of a person suspected of having anaemia, shows large, immature, nucleated erythrocytes without haemoglobin. His symptoms are likely to be alleviated by supplementing his diet with which of the following?**
(a) Folic acid and cobalamine
(b) Riboflavin
(c) Iron compounds
(d) Thiamine
.

54. **There is a road accident patient with an unknown blood group who requires an immediate blood transfusion. His one doctor friend at once offers his blood. What was the blood group of the donor?**
(a) Blood group B
(b) Blood group AB
(c) Blood group O
(d) Blood group A
.

55. **In comparison to those of humans, how are frog erythrocytes?**
    (a) Without nucleus but with haemoglobin
    (b) Nucleated and with haemoglobin
    (c) Very much smaller and fewer
    (d) Nucleated and without haemoglobin
    .

56. **Phagocytosis does not occur in which of the following cells?**
    (a) Monocytes
    (b) Neutrophil
    (c) Basophil
    (d) Macrophage
    .

57. **What is one of the most common symptoms observed in people infected with dengue fever?**
    (a) significant decrease in RBCs count
    (b) significant decrease in WBC count
    (c) significant decrease in platelets count
    (d) significant increase in platelets count
    .

58. **When a cardiac cycle occurs, which of the following is incorrect?**
    (a) The volume of blood pumped out by the Rt and Lt ventricles is the same
    (b) The volume of blood pumped out by the Rt and Lt ventricles is different
    (c) The volume of blood received by each atrium is different
    (d) The volume of blood received by the aorta and pulmonary artery is different
    .

59. **The autonomous neutral system could moderate cardiac activity. Select the correct answer.**
    (a) The parasympathetic system stimulates the heart rate and stroke volume
    (b) The sympathetic system stimulates the heart rate and stroke volume
    (c) The parasympathetic system decreases the heart rate but increases stroke volume
    (d) The sympathetic system decreases the heart rate but increases stroke volume
    .

60. **Distribution of some injectible material/medicine most rapidly and without any risks can be achieved by injecting it into?**
    (a) Muscles
    (b) Arteries
    (c) Veins
    (d) Lymph vessels
    .

61. **Which of the following's characteristics include a neurogenic heart?**
    (a) Lower vertebrates
    (b) Humans
    (c) Rat
    (d) Rabbit
    .

62. **What accelerates heartbeats?**
    (a) Cranial nerves and acetylcholine
    (b) Sympathetic nerves and acetylcholine
    (c) Cranial nerves and adrenaline
    (d) Sympathetic nerves and epinephrine
    .

63. **What is the condition called when the heartbeat increases?**
    (a) Bradycardia
    (b) Tachy cardia
    (c) Leucopenia
    (d) Cardiac arrest
    .

64. **Where are the Purkinje fibres found?**
    (a) Brain
    (b) Skin
    (c) Conduction system of the heart
    (d) Nephrons of kidney
    .

65. **How much time does the cardiac cycle in man take?**
    (a) 0.5 seconds
    (b) 1.0 second
    (c) 1.2 seconds
    (d) 0.8 seconds
    .

66. **What is the first animal in the evolution of animals to have a heart that pumps blood?**
    (a) Annelids
    (b) Roundworms
    (c) Arthropods
    (d) Flatworms
    .

67. **What does the 'T' wave represent in the ECG?**
    (a) diastole of auricles
    (b) diastole of ventricles
    (c) systole of ventricles
    (d) diastole of auricles and ventricles
    .

68. **A layer of single cells is found in which of the following?**
    (a) Blood capillary
    (b) Artery
    (c) Venule
    (d) Vessels
    .

69. **Which blood protein maintains normal blood pressure in a man?**
    (a) Haemoglobin
    (b) Albumin

(c) Fibrinogen
(d) Heparin
.

70. **Where are chordae tendineae found?**
(a) Joints of legs
(b) atria of heart
(c) ventricles of brain
(d) ventricles of heart
.

71. **In response to which of the following does the blood pressure increase and heart rate decrease?**
(a) Exercise
(b) Haemorrhage
(c) Exposure to high altitude
(d) Increased intracranial pressure
.

72. **Why is it that the systolic pressure of the heart is higher than diastolic pressure?**
(a) blood is forcefully pumped into arteries by the heart during systole and not during diastole
(b) arteries offer resistance to the flowing of blood during systole only
(c) arteries contract during systole only.
(d) the volume of blood in the heart is greater during systole than during diastole.
.

73. **What organ receives only oxygenated blood?**
(a) Liver
(b) Pancreas
(c) Kidney
(d) Gills
.

74. **What is the normal blood pressure in an adult?**
(a) 80/120 mm Hg
(b) 100/80 mm Hg
(c) 120/80 mm Hg
(d) 100/120 mm Hg
.

75. **In the blood, the majority of carbon dioxide (CO_2) is released from body tissues as?**
(a) bicarbonate in blood plasma and RBCs
(b) free CO_2 in blood plasma
(c) 70% carbamino- haemoglobin and 30% as bicarbonate
(d) carbamino-haemoglobin in RBCs
.

76. **Given below is the ECG of a normal human. What is the correct interpretation of one of its components in humans?**
(a) Complex QRS-One complete Pulse

(b) Peak T – Initiation of total cardiac contraction
(c) Peak P and Peak R together-Systolic and diastolic blood pressures
(d) Peak P- Initiation of left atrial contraction only
.

77. **Which among the following is essential for the coagulation of blood?**
(a) heparin and calcium ions
(b) calcium ions and platelet factors
(c) oxalates and nitrates
(d) platelet factors and heparin
.

78. **Adult human RBCs are enucleated. Which of the following statement(s) is/are the most appropriate explanation for this feature?**
a They do not need to reproduce
b They are somatic cells
c They do not metabolize
d All their internal space is available for oxygen transport
(a) only a
(b) a, c and d
(c) b and c
(d) only d

.

79. **What does Anti-serum contain?**
(a) antigens
(b) antibodies
(c) leucocytes
(d) RBCs
.

80. **During fibrinolysis, which enzyme induces lysis of fibrinogen to fibrin?**
(a) Plasmin
(b) Thrombin
(c) Fibrin
(d) Trypsin
.

81. **What blood group is suitable for all patients?**
(a) A
(b) B
(c) O
(d) AB
.

82. **The thickest muscular wall of the heart is found in which chamber?**
(a) Left auricle
(b) Left ventricle
(c) Right ventricle
(d) Right auricle
.

83. **Which pair of items have the same meaning?**
    (a) Malleus – Anvil
    (b) SA node – Pacemaker
    (c) Leucocytes – Lymphocytes
    (d) Haemophilia – Blood cancer
    .

84. **An artificial pacemaker is implanted subcutaneously and connected to the heart in patients**
    (a) having 90% blockage of the three main coronary arteries.
    (b) having very high blood pressure.
    (c) with irregularity in the heart rhythm.
    (d) suffering from arteriosclerosis.
    .

85. **What is hirudin?**
    (a) A protein produced by Hordeum vulgare, which is rich in lysine.
    (b) A toxic molecule isolated from Gossypium hirsutum, which reduces human fertility.
    (c) A protein produced from transgenic Brassica napus, which prevents blood clotting.
    (d) An antibiotic produced by a genetically engineered bacterium, Escherichia coli.
    .

86. **Which component of blood prevents it from coagulating in the blood vessels?**
    (a) haemoglobin
    (b) plasma
    (c) thrombin
    (d) heparin
    .

87. **The thickening of arteries caused by cholesterol deposition is called?**
    (a) arteriosclerosis
    (b) rheumatic heart
    (c) blood pressure
    (d) cardiac arrest.
    .

88. **Which of the following pairs is a matching pair?**
    (a) Lubb – Sharp closure of AV valves at the beginning of ventricular systole.
    (b) Dup – Sudden opening of semilunar valves at the beginning of ventricular diastole.
    (c) Pulsation of the radial artery valves in the blood vessels.
    (d) Purkinje fibres-Initiation of the heartbeat.
    .

89. **Lymph node malfunctions would most likely interfere with?**
    (a) release of carbon dioxide into the lymph
    (b) filtering of glucose from the lymph
    (c) release of oxygen into the lymph
    (d) filtering of bacteria from the lymph
    .

90. **What are the arteries that supply blood to the heart called?**
    (a) carotid arteries
    (b) hepatic arteries
    (c) coronary arteries
    (d) pulmonary arteries
    .

91. **During a serious accident, a man whose blood group is unknown needs an immediate blood transfusion. Which one of the following blood groups that is readily available at the hospital safe for transfusion?**
    (a) O, Rh–
    (b) O, Rh+
    (c) AB, Rh–
    (d) AB, Rh+
    .

92. **What statement is true about a normal person's blood?**
    (a) Compared to arteries, veins are less numerous and hold less of the body's blood at any given time.
    (b) Blood cells constitute about 70 percent of the total volume of the blood.
    (c) White blood cells (WBC) are made by lymph nodes only.
    (d) The blood has more platelets than WBC.
    .

93. **Given below are four statements (a-d) regarding the human blood circulatory system**
    (1) Arteries are thick-walled and have narrow lumen as compared to veins
    (2) Angina is acute chest pain when the blood circulation to the brain is reduced
    (3) Persons with blood group AB can donate blood to any person with any blood group under the ABO system
    (4) Calcium ions play a very important role in blood clotting
    Which two of the above statements are correct?
    (a) (1) and (4)
    (b) (1) and (2)
    (c) (2) and (3)
    (d) (3) and (4)
    .

94. **Which one of the following engulfs pathogens rapidly?**
    (a) Acidophils
    (b) Monocytes
    (c) Basophils
    (d) Neutrophils
    .

95. **What is the breakdown product of haemoglobin?**
    (a) Bilirubin
    (b) Iron
    (c) Biliverdin
    (d) Calcium
    .

96. **The Bundle of His is a network of?**
(a) nerve fibres found throughout the heart
(b) muscle fibres distributed throughout the heart walls
(c) muscle fibres found only in the ventricle wall
(d) nerve fibres distributed in ventricles
.

97. **What is the pacemaker of the human heart?**
(a) SA node
(b) tricuspid valve
(c) AV node
(d) SV node
.

98. **What does the pulmonary artery carry?**
(a) deoxygenated blood from the heart to the lungs
(b) deoxygenated blood from the lungs to the heart
(c) oxygenated blood from the heart to the lungs
(d) oxygenated blood from the lungs to the heart
.

99. **In which of the following is a four-chambered heart not found?**
(a) Mammals
(b) Birds
(c) Snake
(d) Crocodile
.

100. **To convert prothrombin into active thrombin by thromboplastin, which cation is required?**
(a) Cu^{2+}
(b) Fe^{3+}
(c) Fe^{2+}
(d) Ca^{2+}
.

101. **What is the blood protein involved in blood coagulation?**
(a) Heparin
(b) Prothrombin
(c) Thrombin
(d) All of these

MCQs on BREATHING AND EXCHANGE OF GASES

1.When there is a shortage of oxygen in the body, which organ is most affected?
(a) Intestine
(b) Skin

(c) Kidney
(d) Brain

2.What causes oxygen to move through the alveolar blood capillaries of the lungs?
(a) Difference in the O2 tension and partial pressure of these chambers
(b) Partial pressure of CO2
(c) Union of O2 with haemoglobin
(d) All of the above

3. **What can be used to represent functional residual capacity?**
(a) TV + ERV
(b) ERV + RV
(c) RV + IRV
(d) ERV + TV + IRV

4. **In addition to respiratory function, the lungs also play a role in?**
(a) Excretion
(b) Temperature regulation
(c) pH regulation
(d) Maintaining the balance of body

5. **What will happen if only the thoracic wall is punctured and not the lungs?**
(a) The lungs get inflated
(b) The man dies as the lungs get collapsed
(c) The breathing rate decreases
(d) The breathing rate increases

6. **The entry of which substance from plasma balances the increased hydrogen ion concentration in RBC when bicarbonate ions diffuse from RBC into plasma during the transport of CO2?**
(a) Water
(b) Oxygen
(c) Hydroxyl ions
(d) Chloride ions

7. **A person living at sea level has around 5 million RBCs per cubic millimeter of blood, whereas one living at an altitude of 5400 metres has around 8 million. This is because at high altitude**
(a) atmospheric O2 level is less and hence more RBCs are needed to absorb the required amount of O2 to survive
(b) there is more UV radiation which enhances RBC production
(c) people eat more nutritive food, therefore more RBCs are formed
(d) people get pollution – free air to breathe and more oxygen is available

8. **Which of the following statements is false?**
(a) The partial pressure of oxygen in deoxygenated blood is 40 mm Hg
(b) The partial pressure of oxygen in oxygenated blood is 95 mm Hg
(c) The partial pressure of oxygen in the alveolar air is 104 mm Hg
(d) The partial pressure of carbon dioxide in deoxygenated blood is 95 mm Hg
.

9. **Why do we not respire for some seconds after taking a long deep breath?**
(a) More CO2 in the blood

(b) More O_2 in the blood
(c) Less CO_2 in the blood
(d) Less O_2 in the blood
.

10. **Ascent of high mountains may cause altitude sickness in men. What is the main cause of this?**
(a) Excess of CO_2 in blood
(b) Decreased efficiency of haemoglobin
(c) Decreased partial pressure of oxygen
(d) Decreased proportion of oxygen in the air
.

11. **Due to flattening of tracheal vessels, alveoli are deprived of oxygen in which disease?**
(a) Bronchitis
(b) Asthma
(c) Pneumonia
(d) Emphysema
.

12. **An increase in lung ventilation rate is caused by which of the following conditions?**
(a) Increase of CO_2 content in inhaled air
(b) Increase of CO_2 content in exhaled air
(c) Decrease of O_2 content in inhaled air
(d) Decrease of O_2 content in exhaled air
.

13. **What controls the rate of breathing?**
(a) The amount of freely available oxygen
(b) Amount of carbon dioxide
(c) Muscular function of the body
(d) Stress
.

14. **In lungs there is a definite exchange of ions between RBC and plasma. What is involved in the removal of CO_2 from blood?**
(a) Influx of Cl^- ions into RBC
(b) Influx of HCO_3^- ions into RBC
(c) Efflux of Cl^- ions into RBC
(d) Efflux of HCO_3^- ions into RBC
.

15. **Where is maximum amount of oxygen lost from the blood?**
(a) Capillaries surrounding the tissue cells
(b) Arteries of the body
(c) Capillaries surrounding the alveoli
(d) Left auricle of the heart
.

16. **In an adult male Periplaneta americana, which of the following paths does air/O_2 take during respiration as it enters the body?**

(a) Hypopharynx, mouth, pharynx, trachea, tissues
(b) Spiracle in metathorax, trachea, tracheoles, oxygen diffuses into cells
(c) Mouth, bronchial tube, trachea, oxygen enters cells
(d) Spiracles in prothorax, tracheoles, trachea, oxygen diffuses into cells
.

17. **When the haemoglobin content of the blood decreases, what disease occurs?**
(a) pleurisy
(b) emphysema
(c) anaemia
(d) pneumonia
.

18. **Which of the following statements are true/false?**
(1) The blood transports CO2 comparatively easily because of its higher solubility.
(2) Approximately 8.9% of CO2 is transported by being dissolved in the plasma of blood.
(3) The carbon dioxide produced by the tissues, diffuses passively into the bloodstream and passes into red blood corpuscles and reacts with water to form H2CO3.
(4) The oxyhaemoglobin (HbO2) of the erythrocytes is basic.
(5) The chloride ions diffuse from plasma into the erythrocytes to maintain ionic balance.
(a) (1), (3) and (5) are true, (2) and (4) are false.
(b) (1), (3) and (5) are false, (2) and (4) are true.
(c) (1), (2) and (4) are true, (3) and (5) are false.
(d) (1), (2) and (4) are false, (3) and (5) are true.
.

19. **Why is respiration in insects called direct?**
(a) the cells exchange O2/CO2 directly with the air in the tubes
(b) the tissues exchanges O2/CO2 directly with coelomic fluid
(c) the tissue exchanges O2/CO2 directly with the air outside through the body surface
(d) tracheal tubes exchange O2/CO2 directly with the haemocoel which then exchanges with tissues
.

20. **Regarding the functions of our respiratory system, mark the wrong statement.**
(a) Humidifies air
(b) Warms up the air
(c) Diffusion of gases
(d) Cleans up the air
.

21. **A person suffers punctures in his chest cavity in an accident. What could be it's effects without any damage to the lungs?**
(a) reduced breathing rate
(b) rapid increase in breathing rate
(c) no change in respiration
(d) cessation of breathing
.

22. **Why is exposure to carbon monoxide harmful to animals?**
    (a) it reduces CO_2 transport
    (b) it reduces O_2 transport
    (c) it increases CO_2 transport
    (d) it increases O_2 transport
    .

23. **Regarding normal breathing. mark the true statement among the following.**
    (a) inspiration is a passive process whereas expiration is active
    (b) inspiration is an active process whereas expiration is passive
    (c) inspiration and expiration are active processes
    (d) inspiration and expiration are passive processes
    .

24. **After forced expiration, someone breathes in some volume of air by forced inspiration. What is this quantity of air taken in called?**
    (a) total lung capacity
    (b) tidal volume
    (c) vital capacity
    (d) inspiratory capacity
    .

25. **In context to O_2 binding to Hb, mark the incorrect statement.**
    (a) higher pH
    (b) lower temperature
    (c) lower pCO_2
    (d) higher pO_2
    .

26. **Mark the correct pair of muscles involved in normal breathing in humans.**
    (a) External and internal intercostal muscles
    (b) Diaphragm and abdominal muscles
    (c) Diaphragm and external intercostal muscles
    (d) Diaphragm and intercostal muscles
    .

27. **Incidence of emphysema, a respiratory disorder is high in cigarette smokers. What is found in such cases?**
    (a) the bronchioles are found damaged
    (b) the alveolar walls are found damaged
    (c) the plasma membrane is found damaged
    (d) the respiratory muscles are found damaged
    .

28. **Certain specialized centres in the brain regulate the respiratory process. Which one of the following centres can reduce the inspiratory duration upon stimulation.**
    (a) Medullary inspiratory centre
    (b) Pneumotaxic centre
    (c) Apneustic centre
    (d) Chemosensitive centre
    .

29. **When does CO_2 dissociate from carbamino haemoglobin?**
    (a) pCO_2 is high and pO_2 is low
    (b) pO_2 is high and pCO_2 is low
    (c) pCO_2 and pO_2 are equal
    (d) None of the above
    .

30. **Using what can air volume be estimated in breathing movements?**
    (a) stethoscope
    (b) hygrometer
    (c) sphygmomanometer
    (d) spirometer
    .

31. **Mark the correct option from the following relationships between respiratory volume and capacities.**
    (i) Inspiratory Capacity (IC) = Tidal Volume + Residual Volume
    (ii) Vital Capacity (VC) = Tidal Volume (TV) + Inspiratory Reserve Volume (IRV) + Expiratory Reserve Volume (ERV) .
    (iii) Residual Volume (RV) = Vital Capacity (VC) – Inspiratory Reserve Volume (IRV)
    (iv) Tidal Volume (TV) = Inspiratory Capacity (IC) – Inspiratory Reserve Volume (IRV)
    Codes
    (a) (i) Incorrect, (ii) Incorrect, (iii) Incorrect, (iv) Correct
    (b) (i) Incorrect, (ii) Correct, (iii) Incorrect, (iv) Correct
    (c) (i) Correct, (ii) Correct, (iii) Incorrect. (iv) Correct
    (d) (i) Correct, (ii) Incorrect, (iii) Correct, (iv) Incorrect
    .

32. **There will be a right shift in the oxygen-haemoglobin dissociation curve in the case of?**
    (a) high pCO_2
    (b) high pO_2
    (c) low pCO_2
    (d) less H^+ concentration
    .

33. **What is an oxidative breakdown of respiratory substrates with the help of O_2 called?**
    (a) fermentation
    (b) anaerobic respiration
    (c) R. Q.
    (d) aerobic respiration
    .

34. **Which of the following statements is correct?**
    (a) Respiratory centres are not affected by CO_2
    (b) In humans vital capacity is just double the expiratory volume
    (c) A human lung has 103 alveoli
    (d) During inspiration the lungs act as suction pumps
    .

35. **Body tissues obtain oxygen from haemoglobin because of its dissociation in tissues caused by?**
    (a) Low oxygen concentration and high carbon dioxide concentration
    (b) Low oxygen concentration
    (c) Low carbon dioxide concentration
    (d) High carbon dioxide concentration
    .

36. **When blood carbon dioxide concentrations rise, what happens to the breathing rate?**
    (a) remain unaffected
    (b) decrease
    (c) stop
    (d) increase
    .

37. **What happens during inspiration?**
    (a) The diaphragm gets raised and ribs get lowered
    (b) Both diaphragm and ribs get raised
    (c) Both diaphragm and ribs get lowered
    (d) The diaphragm gets flattened and ribs get raised
    .

38. **A normal man at rest inspires and expires about 500 millilitres of air. What is this amount known as?**
    (a) complemental volume of air
    (b) tidal volume of air
    (c) reserve volume of air
    (d) residual volume of air
    .

39. **How much amount of O_2 is delivered to the tissues under physiological conditions by 100 ml of oxygenated blood?**
    (a) 5 ml
    (b) 25 ml
    (c) 50 ml
    (d) More the 50 ml
    .

40. **What would happen if the O_2 concentration in tissues was almost as high as at the respiratory surface?**
    (a) oxyhaemoglobin would dissociate to supply O_2 to the tissues
    (b) haemoglobin would combine with more O_2 to the tissues
    (c) oxyhaemoglobin would not dissociate to supply O_2 to the tissues
    (d) CO_2 will interfere with O_2 transport.
    .

41. **All of the haemoglobin in the blood leaving the lungs gets oxygenated, so the tissues can receive oxygen from the blood. This is because**
    (a) the tissues can absorb O_2 from oxyhaemoglobin
    (b) O_2 concentration in tissues is higher and CO_2 concentration lower as compared to lungs

(c) oxyhaemoglobin undergoes reduction
(d) O_2 concentration in tissues is lower and CO_2 concentration higher than in lungs.
.

42. **How can the combination of haemoglobin and O_2 in lungs be improved?**
(a) decreasing O_2 concentration in blood
(b) increasing O_2 concentration in blood
(c) increasing CO_2 concentration in blood
(d) introducing CO into the blood.
.

43. **What is the location of the pneumotaxic centre that can moderate the respiratory rhythm center's function?**
(a) Dorsal side of the medulla
(b) Ventral side of the medulla
(c) Aortic arch and carotid artery
(d) Pons
.

44. **Where does the impulse for voluntary forced breathing start?**
(a) medulla
(b) vagus nerve
(c) spinal cord
(d) cerebrum
.

45. **What is the location of the controlling center of normal breathing in mammals?**
(a) cerebrum
(b) cerebellum
(c) midbrain
(d) medulla oblongata
.

46. **How does atmospheric air compare to alveolar air in terms of pO_2 and pCO_2?**
(a) pO_2 lesser and pCO_2 higher
(b) pO_2 higher and pCO_2 lesser
(c) Both pO_2 and pCO_2 lesser
(d) Both pO_2 and pCO_2 higher
.

47. **What causes asthma?**
(a) Infection of the lungs
(b) Spasm in bronchial muscles
(c) Bleeding into the pleural cavity
(d) infection of trachea
.

48. **How much O_2 is normally carried by 100 ml. of pure blood?**
(a) 40 ml.
(b) 20 ml.
(c) 10 ml.
(d) 30 ml.
.

49. **What would happen if human blood becomes acidic (low pH)?**
    (a) Oxygen-carrying capacity of haemoglobin decreases
    (b) Oxygen-carrying capacity of haemoglobin increases
    (c) RBC count increases
    (d) RBC count decreases
    .

50. **What is the covering of the lungs called?**
    (a) pericardium
    (b) perichondrium
    (c) peritoneum
    (d) pleural membrane
    .

51. **What does the ciliated epithelium in mammals' trachea do?**
    (a) sucking inspired air in
    (b) perceivings sense of smell
    (c) pushing expired air out
    (d) pushing mucus out
    .

52. **Polluted air containing an unusually high concentration of what is inhaled by a patient?**
    (a) carbon disulphide
    (b) chloroform
    (c) carbon dioxide
    (d) carbon monoxide
    .

53. **Severe Acute Respiratory Syndrome (SARS)**
    (a) is caused by a variant of Pneumococcus pneumoniae.
    (b) is caused by a variant of the common cold virus (coronavirus).
    (c) is an acute form of asthma.
    (d) affects non-vegetarians much faster than the vegetarians.
    .

54. **In humans, what is the function of the concentration of carbon dioxide in the plasma?**
    (a) causes increased production of hydrochloric acid.
    (b) regulates gastric acid production by forming carbonic acid.
    (c) regulates breathing rate by its effect on the medulla.
    (d) causes inflammation of the tissues of the bronchial tubes.
    .

55. **If the respiratory rate of 'A' is 35 breaths/min and tidal volume 185 cc/breath and the respiratory rate of 'B' is 25 breaths/min and tidal volume 259 cc/breath, then which of the following is true?**
    (a) Pulmonary ventilation of 'A' and 'B' is the same.
    (b) Alveolar ventilation of 'A' and 'B' is the same.
    (c) Pulmonary ventilation of 'A' is greater than 'B'.
    (d) Alveolar ventilation of 'A' is greater than 'B'.
    .

56. **CO has a higher affinity with Hb than oxygen by how many times?**
    (a) 2 times
    (b) 20 times
    (c) 200 times
    (d) 2000 times
    .

57. **Which two of the following changes usually occur in plain dwellers when they move to high altitudes (3,500 m or more)?**
    (1) Increase in red blood cell size
    (2) Increase in red blood cell production
    (3) Increased breathing rate
    (4) Increase in thrombocyte count
    (a) (2) and (3)
    (b) (3) and (4)
    (c) (1) and (4)
    (d) (1) and (2)
    .

58. **How much CO2 can oxyhaemoglobin transport?**
    (a) 8 ml of CO2/100 ml of blood
    (b) 5 ml of CO2/100 ml of blood
    (c) 3 ml of CO2/100 ml of blood
    (d) 2 ml of CO2/100 ml of blood
    .

59. **Which of the following matches is correct?**
    (a) Emphysema: reduction of the surface area of alveoli and bronchi
    (b) Pneumonia: an occupational disease with asbestos
    (c) Silicosis: inflammation of alveoli
    (d) Asthma: excessive secretion of bronchial mucus
    .

60. **What is the volume of air breathed in and out during normal breathing called?**
    (a) Vital capacity
    (b) IRV
    (c) ERV
    (d) Tidal volume
    .

61. **What is a much-developed larynx of a human male called?**
    (a) Aristotle's lantern
    (b) Syrinx
    (c) Adam's apple
    (d) Muller's organ
    .

62. **CO2 in the blood lowers pH because CO2 combines with _____ , and the rate of reaction increased by _____.**
    (a) H2O to form H+ and HCO3–, carbonic anhydrase
    (b) H2O to form only HCO3–, carbonic anhydrase
    (c) H2O to form only H+, carbonic ions
    (d) H+ to form HCO3–, oxyhaemoglobin

.

63. **Approximately 70% of carbon dioxide absorbed by the blood will be transported to the lungs**
    (a) as bicarbonate ions
    (b) in the form of dissolved gas molecules
    (c) by binding to RBC
    (d) as carbamino – haemoglobin
    .

64. **During oxygen transport, why does the oxyhaemoglobin at the tissue level liberate oxygen to the cells?**
    (a) O_2 concentration is high and CO_2 is low
    (b) O_2 concentration is low and CO_2 is high
    (c) O_2 tension is high and CO_2 tension is low
    (d) O_2 tension is low and CO_2 tension is high
    .

65. **What is the main cause of emphysema?**
    (a) Allergy or hyper sensitisation
    (b) Spasm of the smooth muscles of bronchioles
    (c) Cigarette smoking
    (d) Inflammation of the alveoli
    .

66. **What is a common feature of a human and the insect trachea?**
    (a) Non-collapsible wall
    (b) Supporting rings
    (c) Ectodermal origin
    (d) Endodermal origin
    .

67. **What does 6000 to 8000 ml of air refer to?**
    (a) Vital capacity of lungs
    (b) Volume of normal expiration per minute
    (c) Sum of IRV + ERV
    (d) Inspiratory capacity of lungs
    .

68. **In the absence of oxygen, which of the following can respire?**
    (a) Amoeba
    (b) Tapeworm
    (c) House fly
    (d) Hydra
    .

69. **Chloride ions migrate from plasma to RBC and carbonate ions migrate from RBC to plasma through what process?**
    (a) chloride shift
    (b) ionic shift
    (c) atomic shift
    (d) Na^+ pump
    .

70. **At the site of gas exchange in the alveoli of the lungs, the air is separated from blood by?**
    (a) alveolar epithelium only
    (b) alveolar epithelium and capillary endothelium
    (c) alveolar epithelium, capillary endothelium and tunica adventitia
    (d) alveolar epithelium, capillary endothelium, a thin layer of tunica media and tunica adventitia
    .

71. **What does the quantity 1500 ml in the respiratory volumes of a normal human adult refer to?**
    (a) maximum air that can be breathed in and breathed out
    (b) residual volume
    (c) expiratory reserve volume
    (d) total lung capacity
    .

72. **After a normal expiration, the volume of air that remains in the lungs is called?**
    (a) Residual volume
    (b) Vital capacity
    (c) Expiratory capacity
    (d) Functional residual capacity
    .

73. **Carbon dioxide is transported to the lungs via the blood as?**
    (a) dissolved in blood plasma
    (b) in the form of carbonic acid only
    (c) in combination with haemoglobin only
    (d) carbaminohaemoglobin and as carbonic acid
    .

74. **Despite carrying a large amount of CO2, why does blood not become acidic?**
    (a) it is absorbed by the leucocytes
    (b) blood buffers play an important role in CO2 transport.
    (c) it combines with water to form H2CO3which is neutralized by NaCO3
    (d) it is continuously diffused through tissues and is not allowed to accumulate
    .

75. **What transports carbon dioxide from tissues to the respiratory surface?**
    (a) plasma and erythrocytes
    (b) plasma
    (c) erythrocytes
    (d) erythrocytes and leucocytes
    .

76. **What is the passive breathing process in humans?**
    (a) Expiration
    (b) Aspiration
    (c) Inspiration
    (d) Forced breathing
    .

77. **What transports oxygenated blood from the lungs to the heart?**
    (a) Pulmonary artery
    (b) Pulmonary vein
    (c) Coronary vein
    (d) Pre-cavals
    .

78. **What form does CO_2 take during respiration?**
    (a) Dissolved plasma
    (b) Sodium carbonate
    (c) $KHCO_3$
    (d) Partly dissolved in plasma and partly in the form of sodium and potassium bicarbonate
    .

79. **Which of the following is an example of a buffer system in the blood?**
    (a) Haemoglobin and oxyhaemoglobin
    (b) Oxygen and carbon dioxide
    (c) Albumin and globulin
    (d) Sodium bicarbonate and carbonic acid
    .

80. **In mitochondria, which enzyme is absent?**
    (a) Aconitase
    (b) Malic dehydrogenase
    (c) Hexokinase
    (d) None of these
    .

81. **Towards where would the oxygen curve shift if the CO_2 concentration is higher?**
    (a) Right
    (b) Left
    (c) Central
    (d) None of these
    .

82. **What is the amount of volume of air that can be inspired/expired normally called?**
    (a) Tidal volume
    (b) Vital capacity
    (c) Residual volume
    (d) Normal volume
    .

83. **What does the vital capacity of the lung include?**
    (a) IRV + TV + ERV
    (b) ERV + RV
    (c) ERV + TV
    (d) IRV + TV
    .

84. **What is the capacity of the human lung?**
    (a) 3000 ml
    (b) 1500 ml
    (c) 1000 ml
    (d) 500 ml
    .

85. **Regarding the transport of respiratory gases by blood, identify the true statement.**
    (a) Haemoglobin is necessary for the transport of carbon dioxide and carbonic anhydrase for the transport of oxygen
    (b) Haemoglobin is necessary for the transport of oxygen and carbonic anhydrase for the transport of carbon dioxide
    (c) Only oxygen is transported by the blood
    (d) Only carbon dioxide is transported by the blood
    .

86. **Which of these has the smallest diameter?**
    (a) Right primary bronchus
    (b) Left primary bronchus
    (c) Trachea
    (d) Respiratory bronchiole
    .

87. **A relative proportion of CO_2 released to O_2 absorbed in respiration is called as?**
    (a) Respiratory exchange
    (b) Respiratory quotient
    (c) Respiratory phase
    (d) None of the above
    .

88. **Regarding respiration in humans, which of the following is the correct statement?**
    (a) Cigarette smoking may lead to inflammation of the bronchi
    (b) Neural signals from the pneumotaxic centre in the pons region of the brain can increase the duration of inspiration
    (c) Workers in grinding and stone-breaking industries may suffer from lung fibrosis
    (d) About 90% of carbon dioxide (CO_2) is carried by haemoglobin as carbamino haemoglobin
    .

89. **By making a conscious effort, which of the following options is most likely for most of us concerning breathing?**
    (a) One can breathe out air totally without oxygen.
    (b) One can breathe out air through eustachian tubes by closing both the nose and the mouth.
    (c) One can consciously breathe in and breathe out by moving the diaphragm alone, without moving the ribs at all.
    (d) The lungs can be made fully empty by forcefully breathing out all air from them
    .

90. **What mammalian cell is not capable of aerobically metabolizing glucose to carbon dioxide?**
(a) Unstraited muscle cells
(b) Liver cells
(c) Red blood cells
(d) White blood cells
.

91. **What causes the 'blue baby' syndrome?**
(a) Excess of dissolved oxygen
(b) Excess of TDS (total dissolved solids)
(c) Excess of chloride
(d) Methaemoglobin
.

Answer the Following questions-

1. **Why do we consider blood as a connective tissue?**

2.What is meant by double circulation? What is its significance?

3. Write the differences between:

(a) Blood and Lymph

(b) Open and Closed system of circulation

(c) Systole and Diastole

(d) P-wave and T-wave

4. Why do we call our heart myogenic?

5. Sino-atrial node is called the pacemaker of our heart. Why?

6. What is the significance of the atrioventricular node and the atrioventricular bundle in the functioning of the heart?

7. Define the cardiac cycle and the cardiac output.

8. Give a brief account of the counter-current mechanism.

9. Describe the role of the liver, lungs and skin in excretion.

10 . Explain micturition.

Wishing you happy and safe holidays.

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