

DPP - Daily Practice Problems

Chapter-wise Sheets

Date :

Start Time :

End Time :

BIOLOGY

CB18

SYLLABUS : Body Fluids and Circulation

Max. Marks : 180

Marking Scheme : + 4 for correct & (–1) for incorrect

Time : 60 min.

INSTRUCTIONS : This Daily Practice Problem Sheet contains 45 MCQs. For each question only one option is correct. Darken the correct circle/ bubble in the Response Grid provided on each page.

- Blood pressure is measured by
(a) sphygmomanometer (b) stethoscope
(c) electrocardiogram (d) phonocardiogram
- Coronary artery disease (CAD) is often referred to as
(a) Heart failure (b) Cardiac arrest
(c) Atherosclerosis (d) Thrombosis
- Which one of the following is a **correct** 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 fibers - Initiation of the heart beat.
- Child death may occur in the marriage between
(a) Rh⁺ man and Rh⁺ woman
(b) Rh⁺ man and Rh[–] woman
(c) Rh[–] man and Rh[–] woman
(d) Rh[–] man and Rh⁺ woman
- Heart is covered by
(a) Peritoneum (b) Pleural membrane
(c) Pericardium (d) Visceral membrane
- Which one of the components of ECG in human is correctly interpreted below ?
(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
- Pacemaker of heart is
(a) AV node (b) Bundle of His
(c) SA node (d) Purkinje fibres
- Uricotelism is found in
(a) Frogs and toads
(b) Mammals and birds
(c) Birds, reptiles and insects
(d) Fishes and fresh water protozoans

RESPONSE
GRID

1. (a)(b)(c)(d)

2. (a)(b)(c)(d)

3. (a)(b)(c)(d)

4. (a)(b)(c)(d)

5. (a)(b)(c)(d)

6. (a)(b)(c)(d)

7. (a)(b)(c)(d)

8. (a)(b)(c)(d)

Space for Rough Work

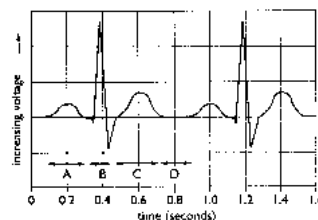
9. Haemoglobin is having maximum affinity with:
 (a) NH_3 (b) O_2
 (c) CO_2 (d) CO
10. An adult human with average health has systolic and diastolic pressures as
 (a) 80mm Hg and 80 mm Hg
 (b) 70 mm Hg and 120 mm Hg
 (c) 120 mm Hg and 80 mm Hg
 (d) 50 mm Hg and 80 mm Hg
11. Blood group AB has
 (a) no antigen
 (b) no antibody
 (c) neither antigen nor antibody
 (d) both antigen and antibody
12. With reference to the blood in a normal person, which one of the following statements is correct?
 (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.
13. Thickening of arteries due to cholesterol deposition is
 (a) arteriosclerosis (b) rheumatic heart
 (c) blood pressure (d) cardiac arrest
14. Hepatic portal system carries
 (a) Oxygenated blood from liver to intestine
 (b) Deoxygenated blood from liver to intestine
 (c) Oxygenated blood from intestine to liver
 (d) Deoxygenated blood from intestine to liver
15. 'Bundle of His' is a part of which one of the following organs in humans?
 (a) Brain (b) Heart
 (c) Kidney (d) Pancreas
16. Chordae tendinae are found in
 (a) joints of legs (b) atria of heart
 (c) ventricles of brain (d) ventricles of heart
17. The pattern of contraction and relaxation of the heart is referred to as
 (a) blood pressure (b) arterial flow
 (c) blood flow (d) cardiac cycle
18. Which of the following statements are true ?
 (i) The blood transports CO_2 comparatively easily because of its higher solubility.
 (ii) Approximately 8-9% of CO_2 is transported being dissolved in the plasma of blood.
 (iii) The carbon dioxide produced by the tissues, diffuses passively into the blood stream and passes into red blood corpuscles and react with water to form H_2CO_3 .
 (iv) The oxyhaemoglobin (HbO_2) of the erythrocytes is basic.
 (v) The chloride ions diffuse from plasma into the erythrocytes to maintain ionic balance.
 (a) (i), (iii) and (v) are true, (ii) and (iv) are false
 (b) (i), (iii) and (v) are false, (ii) and (iv) are true
 (c) (i), (ii) and (iv) are true, (iii) and (v) are false
 (d) (i), (ii) and (iv) are false, (iii) and (v) are true
19. About 70% of CO_2 is transported as
 (a) Carbonic acid (b) Carboxyhaemoglobin
 (c) Bicarbonates (d) Carbamino compounds
20. In human heart, which of the following valve remains in contact of the oxygenated blood only?
 (a) Tricuspid valve (b) Semi lunar valve
 (c) Eustachian valve (d) Mitral valve
21. Myocardial Infarction is caused by
 (a) hardening of arteries
 (b) lumpy thickness develop in the inner walls of arteries
 (c) clot may occur in the lumen of a coronary artery
 (d) sudden interruption in blood flow towards a portion of heart
22. The affinity of CO with Hb is more than oxygen by
 (a) 2 times (b) 20 times
 (c) 200 times (d) 2000 times
23. Life span of human RBCs is
 (a) 120 days (b) 20 days
 (c) 9 days (d) 90 days

RESPONSE
GRID

- | | | | | |
|------------------|------------------|------------------|------------------|------------------|
| 9. (a)(b)(c)(d) | 10. (a)(b)(c)(d) | 11. (a)(b)(c)(d) | 12. (a)(b)(c)(d) | 13. (a)(b)(c)(d) |
| 14. (a)(b)(c)(d) | 15. (a)(b)(c)(d) | 16. (a)(b)(c)(d) | 17. (a)(b)(c)(d) | 18. (a)(b)(c)(d) |
| 19. (a)(b)(c)(d) | 20. (a)(b)(c)(d) | 21. (a)(b)(c)(d) | 22. (a)(b)(c)(d) | 23. (a)(b)(c)(d) |

Space for Rough Work

24. Which one of the following is an incorrect matching pair?
- Lubb-Sharp closure of AV valves at the beginning of atrial systole
 - Dub-Sudden opening of semilunar valves at the end of ventricular systole
 - Cardiac Output-Stroke volume and heart beat
 - Initiation of the heart beat -sino atrial node
25. Erythroblastosis foetalis occurs when
- Mother is Rh negative and father is Rh positive
 - Father is Rh negative and mother is Rh positive
 - Both are Rh positive
 - Both are Rh negative
26. Which of the following set of animals has an incomplete double circulation system?
- Frog and crocodile
 - Shark and whale
 - Lizard and pigeon
 - Toad and lizard
27. Find out the incorrect answer from the following?
- Veins are typically larger in diameter than arteries
 - Because of their small size, capillaries contain blood that is moving more quickly than in other parts of the circulatory system
 - The walls of arteries are elastic, enabling them to stretch and shrink during changes in blood pressure
 - Veins contain more blood than any other part of the circulatory system
28. Given below are four statements (i-iv) regarding human blood circulatory system
- Arteries are thick-walled and have narrow lumen as compared to veins
 - Angina is acute chest pain when the blood circulation to the brain is reduced
 - Persons with blood group AB can donate blood to any person with any blood group under ABO system
 - Calcium ions play a very important role in blood clotting
- Which two of the above statements are correct?
- (i) and (iv)
 - (i) and (iv)
 - (ii) and (iii)
 - (iii) and (iv)
29. Haldane effect plays more important role in promoting carbon dioxide transport than that of the Bohr's effect in promoting oxygen transport because
- oxyhaemoglobin is a stronger acid which donates hydrogen ion (H^+) which in turn displace carbon dioxide from blood
 - carbaminohaemoglobin is a stronger acid which splits into hydrogen ion (H^+) and bicarbonate (HCO_3^-)
 - carbon dioxide reacts with water to form carbonic acid that lowers the pH in tissue
 - carbon dioxide is less soluble in venous blood than in arterial blood
30. Which of the following factors is known as Christmas factor?
- Factor VIII
 - Factor XII
 - Factor IV
 - Factor IX
31. In veins, valves are present to check backward flow to blood flowing at
- high pressure
 - atmospheric pressure
 - low pressure
 - all of these
32. In a cardiac output of 5250 ml per minute, with 75 heartbeats per minute, the stroke volume is
- 60ml
 - 80ml
 - 55ml
 - 70ml
33. Heart valves function to
- keep blood moving forward through the heart.
 - mix blood thoroughly as it passes through the heart.
 - control the amount of blood pumped by the heart.
 - slow blood down as it passes through the heart.
34. The accompanying diagram shows a small part of a normal electrocardiogram. Which region represents a wave of excitation passing through the ventricles?



- A
- B
- C
- D

RESPONSE
GRID

- | | | | | |
|---------------------|---------------------|---------------------|---------------------|---------------------|
| 24. (a) (b) (c) (d) | 25. (a) (b) (c) (d) | 26. (a) (b) (c) (d) | 27. (a) (b) (c) (d) | 28. (a) (b) (c) (d) |
| 29. (a) (b) (c) (d) | 30. (a) (b) (c) (d) | 31. (a) (b) (c) (d) | 32. (a) (b) (c) (d) | 33. (a) (b) (c) (d) |
| 34. (a) (b) (c) (d) | | | | |

Space for Rough Work

35. Just after blood leaves the left ventricle of the human heart, it passes through the
(a) pulmonary artery (b) left atrium
(c) aorta (d) superior vena cava
36. In the human body, the highest blood pressure can be recorded in
(a) arteries near the heart
(b) veins returning to the heart
(c) capillaries of the body tissue
(d) the lungs
37. Blood flows rather rapidly as it leaves the human heart. Upon arriving at the capillaries, it slows dramatically. This reduction in speed is due largely to
(a) the loss of pressure as the blood gets farther away from the heart.
(b) changes in pressure that result from water evaporation on the skin.
(c) the resistance offered by the small diameter of the capillaries.
(d) differences in pressure caused by the sugar content of the blood.
38. The atrial walls are ____ than the ventricular wall, and pressure generated in the atrial chambers is ____ than in the ventricles.
(a) thinner, higher (b) thinner, lower
(c) thicker, higher (d) thicker, lower
39. Atheroma consist mainly of
(a) cholesterol and lipid hardened by calcium
(b) cholesterol and lipid hardened by iron
(c) glycogen and protein hardened by calcium
(d) glycogen and protein hardened by iron
40. The left ventricle exceeds the right ventricle in
(a) the amount of blood that enters during heart contraction.
(b) the volume expelled during contraction
(c) the pressure developed during contraction
(d) all of the above
41. The purpose of the AV node is to ____ and the purpose of the Purkinje fibers is to ____ .
(a) create simultaneous atrial and ventricular depolarization; speed up transmission of the cardiac impulse into the ventricle
(b) delay ventricular depolarization relative to atrial depolarization; insulate the cardiac impulse from the general ventricular fibers
(c) delay ventricular depolarization relative to atrial depolarization; transmit the cardiac impulse to very small localized groups of ventricular fibers
(d) delay atrial depolarization relative to ventricular depolarization; transmit the cardiac impulse to very small localized groups of ventricular fibers
42. Persons suffering from high blood pressure should take the following precaution to avoid excessive rise in their blood pressure
(a) sleep as much as possible
(b) avoid standing
(c) increase their weight
(d) avoid emotional disturbances and excitement
43. You are required to draw blood from a patient and to keep the blood in a test tube for analysis of corpuscles and plasma. You are also provided with the following four types of test tubes. Which of them will you not use for the purpose?
(a) Test tube containing calcium bicarbonate
(b) Chilled test-tube
(c) Test-tube containing heparin
(d) Test-tube containing sodium oxalate
44. A drop of each of the following, is placed separately on four slides. Which of them will not coagulate?
(a) Blood serum
(b) Sample from the thoracic duct of lymphatic system
(c) Whole blood from pulmonary vein
(d) Blood plasma
45. Examination of blood of a person suspected of having anemia, shows large, immature, nucleated erythrocytes without haemoglobin. Supplementing his diet with which of the following, is likely to alleviate his symptoms?
(a) Folic acid and cobalamine (b) Riboflavin
(c) Iron compounds (d) Thiamine

**RESPONSE
GRID**

35. (a) (b) (c) (d) 36. (a) (b) (c) (d) 37. (a) (b) (c) (d) 38. (a) (b) (c) (d) 39. (a) (b) (c) (d)
40. (a) (b) (c) (d) 41. (a) (b) (c) (d) 42. (a) (b) (c) (d) 43. (a) (b) (c) (d) 44. (a) (b) (c) (d)
45. (a) (b) (c) (d)

Space for Rough Work

DAILY PRACTICE PROBLEM DPP CHAPTERWISE 18 - BIOLOGY

Total Questions	45	Total Marks	180
Attempted		Correct	
Incorrect		Net Score	
Cut-off Score	50	Qualifying Score	60
Success Gap = Net Score – Qualifying Score			
Net Score = (Correct × 4) – (Incorrect × 1)			

HINTS & SOLUTIONS

DPP/CB18

1. (a)
2. (c)
3. (a) Lubd sound is caused partly by the closure of the bicuspid and tricuspid valves and partly by the contraction of the muscles in the ventricles. Lubd is the first heart sound.
4. (b) Rh factor was discovered by Karl Landsteiner. A child of Rh⁺ man will be Rh⁺ whether the mother is Rh⁺ or Rh⁻. If the mother is Rh⁺ then there will be no problem but if mother is Rh⁻ so when the blood of Rh⁺ child (in womb) mixes with the blood of Rh⁻ mother then some antibodies in mother's blood are formed against Rh⁺ factor which coagulate the womb blood causing death. If birth takes place then there is a possibility of child death in early years. This is known as erythroblastosis foetalis. In most cases the 1st pregnancy may succeed but after that it fails.
5. (c)
6. (c) Peak P-causes diastolic phase in ventricle while R-Peak causes systole in ventricle means diastolic and systolic phases represented by P & R.
7. (c) Sino-Auricular node (SA node) present in the walls of right auricle has a myogenic initiation of heartbeat in a regular fashion and controls the pace of heartbeat called pacemaker.
8. (c)
9. (d) Haemoglobin has 250 times more affinity for CO as compared to oxygen. Hb readily combines with CO, forming carboxyhaemoglobin (COHb), COHb interferes with the transport of oxygen.
10. (c) An adult healthy human has average systolic and diastolic blood pressure as given below :

$$\text{B.P.} = \frac{\text{Systolic}}{\text{Diastolic}} = \frac{120 \text{ mm Hg}}{80 \text{ mm Hg}}$$
11. (b) Blood group A – Antigen-A & Antibody 'b' or Anti A or a.
 Blood group B – Antigen-B & antibody a or Anti B or b.
 Blood group AB – Antigen-A & B and no antibody.
 Blood group O – No antigen & Antibodies a & b both.
12. (d) The number of blood platelets per cubic mm in human blood is 3 lacs while WBCs are 5000/cubic mm of blood. Veins are as complex as the arteries. Veins and arteries both are types of blood vessels. Arteries carry blood from heart to different organs while vein carries blood from different organs to heart. At any given time in a healthy human, the blood amount is same in both, as the circulation of blood never stops.
 Blood consists of two parts:
 The **plasma** (water, proteins, inorganic salts and other elements) constitutes 55-60% of blood while **cellular** part constitutes 40-45% of total blood. WBC are produced in red bone marrow, lymph nodes and sometimes even in liver and spleen.
13. (a) High proportion of cholesterol in blood leads to deposition of cholesterol on the walls of blood vessels. This causes the arteries to lose their elasticity and get stiffened. This is called arteriosclerosis or hardening of arteries.
14. (d)
15. (b) 'Bundle of His' are a typical cardiac muscle fibres, connecting the atria with ventricle.
16. (d)
17. (d)
18. (a)
19. (c)
20. (d)
21. (d)
22. (c)
23. (a)
24. (a)
25. (a)
26. (d)
27. (b)
28. (a)
29. (a) The degree of oxygenation of blood markedly affects the amount of CO₂ transported in blood. The lower the pO₂ and the haemoglobin saturation with O₂, the more the CO₂ that can be carried in the blood. This phenomenon, is called the Haldane effect. It depicts the greater ability of reduced haemoglobin to form carbamino haemoglobin and to buffer H⁺ by combining with it. In the pulmonary circulation, uptake of O₂ facilitates the release of CO₂. As haemoglobin becomes saturated with O₂, the hydrogen ions released combine with HCO₃⁻, helping to unload CO₂ from the pulmonary blood. The Haldane effect is quantitatively more important in promoting O₂ transport than the Bohr effect in promoting O₂ transport. It results from the simple fact that combination of O₂ with haemoglobin causes the haemoglobin (oxyhaemoglobin) to become a stronger acid. This in turn displaces CO₂ from the blood.
30. (d) Christmas factor (factor IX) is a plasma thromboplastin component i.e. a thromboplastin activator present in blood plasma. Its deficiency causes congenital disease called hemophilia B (also called Christmas disease).
31. (c) Veins bring blood from different body parts to the heart. The flow of blood in veins is not so fast because the blood in veins is under low pressure. Veins possess valves which prevent backward flow of blood.
32. (d) Cardiac output = Stroke volume × heart beats per minute

$$\therefore \text{Stroke volume} = \frac{\text{Cardiac output}}{\text{Heart beats per minute}}$$

$$= \frac{5250}{75} = 70 \text{ ml}$$
33. (a) Heart valves only permit unidirectional flow of blood.
34. (b)
35. (c) The left ventricle pumps blood into the aorta.
36. (a) Contraction of the ventricle produces pressure in the human circulatory system. Blood leaves the ventricles and then immediately enters the arteries moving away from the heart. Blood pressure will have its highest recording in these arteries.
37. (c) The small diameter of capillaries offers great resistance to blood flow. This slows the blood to a speed at which nutrient and gas exchange with neighboring cells is more efficient.
38. (b) The atrium has thinner walls and generates lower pressures than the ventricles.
39. (a)
40. (c) The left ventricle generates a greater pressure in the blood flowing to the systemic circuit than the right ventricle with blood flowing to the pulmonary circuit.
41. (c) The AV node delays the ventricular depolarization relative to atrial depolarization, so atrial contraction occurs before ventricular contraction. The Purkinje fibers transmit the cardiac impulse to very small localized groups of ventricular fibers.
42. (d)
43. (a) Presence of calcium will remove heparin - blood anticoagulant and will promote blood clotting. Sodium oxalate and heparin containing test tubes will not allow the blood to clot.
44. (a) Blood serum is liquid minus clotting elements of pale yellow colour. It does not have fibrinogen and other clotting materials. It does not take part in blood clotting.
45. (a) Folic Acid (Cyanocobalamine vit. B₁₂) works in the formation and maturation of RBCs. In the deficiency of this RBCs formation decreases and the formed RBCs will not mature i.e. they will not lose the nucleus and hence remain nucleated and lack haemoglobin. Such RBCs cannot carry oxygen & person suffers from anaemia. Supplementing his diet with folic acid and cobalamine will lead to the increased formation and proper maturation of enucleated RBCs with haemoglobin and eliminate anaemia.