ULTIMATE KCET CRASH COURSE 2026

ZOOLOGY

Breathing and Exchange of Gases Body Fluids and Circulation Excretory Products and Their Elimination

DPP :- 01

Q1 When carbon dioxide concentration in blood increases breathing becomes
(A) Shallower and slow
(B) There is no effect on breathing
(C) Slow and deep
(D) Faster and deeper

Q2 The partial pressure of oxygen in the alveoli of the lungs is
(A) equal to that in the blood
(B) more than that in the blood
(C) less than that in the blood
(D) less than that of carbon dioxide

Q3 Choose the **incorrect** statement.
(A) The thickness of diffusion membrane is less than a millimetre.
(B) The human lungs comprise the branching network of bronchi, bronchioles and alveoli.
(C) Alveoli are the primary sites of exchange of gases.
(D) Aquatic arthropods exhibit pulmonary respiration.

Q4 During inspiration
(A) Diaphragm and external intercostals muscle relax
(B) Diaphragm and internal intercostals muscles relax
(C) Diaphragm and internal intercostals muscles contract
(D) Diaphragm and external intercostals muscles contract

Q5 Read the following statements (**I-V**).
I. Humans have the ability to increase the strength of inspiration and expiration.
II. Breathing involves two stages.
III. The contraction of external inter-costal muscles presses the ribs down.
IV. Pharynx is common passage for food and air.
V. Sponges exchange O_2 with CO_2 by branchial respiration.
Which of the above statements are **incorrect**?
(A) I, II and III only
(B) I, III and V only
(C) I, II, III and IV only
(D) III and V only

Q6 Consider the characteristics of a respiratory control centre in humans:
(i) It is located in pons.
(ii) It moderates the functions of respiratory rhythm centre.
(iii) Its absence results in an increase in depth of respiration.
The respiratory control centre is:
(A) pneumotaxic centre.
(B) parasympathetic nervous system.
(C) chemosensitive zone.
(D) Both (B) and (C)

Q7 Name the pulmonary disease in which alveolar surface area involved in gas exchange is drastically reduced due to damage in the alveolar walls.
(A) Pneumonia
(B) Asthma
(C) Pleurisy
(D) Emphysema

Q8 100ml pure blood carries
(A) 1.34mlO_2 (B) 20mlO_2
(C) 15mlO_2 (D) 4ml O_2

Q9 Which of the following statements are correct regarding the respiratory system?
1. The diaphragm and intercostal muscles play a role in generating pressure gradients during breathing.
2. Alveoli are responsible for the exchange of gases between the respiratory system and the bloodstream.
3. Oxyhemoglobin refers to the binding of oxygen with carbon dioxide in the blood.
4. Diffusion is the process by which oxygen and carbon dioxide are transported in the bloodstream.
5. The medulla is a specialized region in the brain responsible for maintaining the respiratory rhythm.
Answer choices:
(A) 1, 2, 3 (B) 1, 2, 4
(C) 2, 3, 4 (D) 1, 2, 5

Q10 Which of the following conditions is/are associated with emphysema?
A. The major cause is cigarette smoking.
B. Alveolar walls are damaged.
C. Wheezing sound is produced.
D. Respiratory surface is increased.
(A) A and B only (B) B only
(C) C and D only (D) D only

Q11 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

Q12 Read the following statements and choose the correct option:
Statement-I: Heart is a mesodermally derived organ, situated in the thoracic cavity.
Statement-II: It is protected by double membranous bag called pericardium, enclosing
pericardial fluid.
(A) Both statements are incorrect
(B) Only statement I is correct
(C) Only statement II is correct
(D) Both statements are correct

Q13 In fishes, oxygenation of blood takes place by:
(A) lungs (B) gills
(C) skin (D) buccal cavity

Q14 Atherosclerosis is caused by deposition of
(A) Calcium
(B) Fat and cholesterol
(C) Deposition of fibrous tissue
(D) All of the above

Q15 The haemoglobin content per 100 ml of blood of a normal healthy human adult is
(A) 5 – 11 mg
(B) 25 – 30 mg
(C) 17 – 20 mg
(D) 12 – 16 mg.

Q16 What is the inactive precursor of thrombin present in plasma?
(A) Fibrinogen (B) Prothrombin
(C) Thrombokinase (D) Fibrin

Q17 Globulins contained in human blood plasma are primarily involved in
(A) osmotic balance of body fluids
(B) oxygen transport in the blood
(C) clotting of blood
(D) defence mechanisms of the body

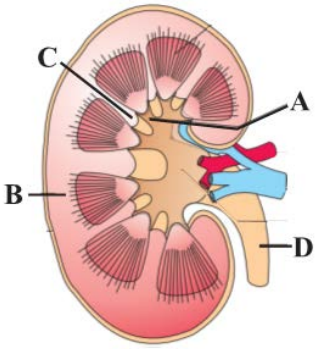
Q18 Blood pressure in the mammalian aorta is maximum during
(A) Diastole of the right atrium
(B) Systole of the left atrium
(C) Diastole of the right ventricle
(D) Systole of the left ventricle

Q19 What will happen if a Rh− person's blood is exposed to the Rh+ person?
(A) Antigen formation takes place
(B) Negative and positive Rh antigen cancel out each other
(C) Nothing will happen
(D) Antibody will be produced

Q20 Which of the following is correct about human heart?
(A) The volume of both atria > the volume of both ventricles
(B) The volume of both ventricle > the volume of both atria
(C) The volume of both atria = the volume of both ventricles
(D) Ventricles are upper chambers and atria are lower chambers in our heart

Q21 Regulation of GFR (Glomerular Filtration Rate) takes place by
(A) Renin-angiotensin mechanism
(B) Juxtaglomerular apparatus
(C) Vasopressin
(D) All of the above

Q22 Given figure is of longitudinal section of kidney. Identify the parts labelled as **A** to **D** and select the **correct** option.



(A) A-Cortex, B-Calyx, C-Renal column, D-Ureter
(B) A-Calyx, B-Cortex, C-Renal column, D-Ureter
(C) A-Medulla, B-Cortex, C-Renal capsule, D-Urethra
(D) A- Calyx, B-Cortex, C-Renal pelvis, D-Urethra

Q23 An organism which do not have loop of Henle will excrete
(A) No urine
(B) Dilute urine
(C) Concentrated urine
(D) No change in urine

Q24 The part of nephron involved in active reabsorption of sodium is
(A) distal convoluted tubule
(B) proximal convoluted tubule
(C) Bowman's capsule
(D) descending limb of Henle's loop

Q25 ADH causes
(A) Increased water absorption from DCT and CT
(B) Increased GFR by increasing blood pressure
(C) Increases reabsorption of electrolyte from distal tubules
(D) All of these

Q26 Which part of nephron is impermeable to H_2O but allows transport of electrolytes actively or passively?

(A) PCT
(B) Descending limb of loop of Henle
(C) Ascending limb of loop of Henle
(D) DCT

Q27 Choose the incorrect statement.

(A) Tubular cells secrete H^+, K^+, ammonia to filtrate
(B) Tubular cells help to maintain the acid-base balance of the body fluid
(C) Tubular cells help in ionic balance
(D) Tubular secretion is not significant step in urine formation

Q28 Podocytes are

(A) Endothelial cells of the glomerulus
(B) Endothelial cells of the Bowman's capsule
(C) Epithelial cells of the Bowman's capsule
(D) Epithelial cells of the glomerulus

Q29 Match **List-I** with **List-II:**

List-I		**List-II**	
(A)	Glycosuria	(I)	Accumulation of urea in blood
(B)	Renal calculi	(II)	Inflammation in glomeruli
(C)	Glomerulone phritis	(III)	Mass of crystallised salts within the kidney
(D)	Uremia	(IV)	Presence of glucose in urine

Choose the **correct** answer from the options given below:

(A) A-III, B-IV, C-I, D-II
(B) A-IV, B-III, C-II, D-I
(C) A-II, B-III, C-I, D-IV
(D) A-II, B-IV, C-III, D-I

Q30 What is the purpose of adding anti-heparin to the cleared blood before pumping it back to the body?

(A) To prevent blood clotting
(B) To enhance oxygenation of the blood
(C) To increase the flow rate of the blood
(D) To remove toxins from the blood

Answer Key

Q1	D
Q2	B
Q3	D
Q4	D
Q5	D
Q6	A
Q7	D
Q8	B
Q9	D
Q10	A
Q11	B
Q12	D
Q13	B
Q14	D
Q15	D
Q16	B
Q17	D
Q18	D
Q19	D
Q20	B
Q21	B
Q22	B
Q23	B
Q24	B
Q25	D
Q26	C
Q27	D
Q28	C
Q29	B
Q30	A

Hints & Solutions

Note: scan the QR code to watch video solution

Q1 Text Solution:

Faster and deeper

Video Solution:

Q2 Text Solution:

The partial pressure of oxygen in alveolar air is 104 mm Hg whereas it is 40 mm Hg in deoxygenated blood and 95 mm Hg in oxygenated blood.

Video Solution:

Q3 Text Solution:

Aquatic arthropods exhibit branchial respiration by the special vascularised structures called gills.

Video Solution:

Q4 Text Solution:

During inspiration, diaphragm and external intercostals muscles contract.

Video Solution:

Q5 Text Solution:

- The contraction of external inter-costal muscles lifts up the ribs and the sternum causing an increase in the volume of the thoracic chamber in the dorso-ventral axis.
- Special vascularised structures called gills (branchial respiration) are used by most of the aquatic arthropods and molluscs.
- Lower invertebrates like sponges, performs gaseous exchange by simple diffusion over their entire body surface.

Video Solution:

Q6 Text Solution:

The respiratory control center described here is the pneumotaxic center, which is located in the pons and plays a role in moderating the activity of the respiratory rhythm center in the medulla oblongata.

Video Solution:

Q7 Text Solution:

Emphysema is an inflation or abnormal distension of the bronchioles or alveolar sacs of the lungs. Many of the septa between the alveoli are destroyed and much of the elastic tissue of the lungs is replaced by connective tissue. As the alveolar septa collapse, the surface area for gas exchange is greatly reduced. There is loss of elasticity in the walls of bronchioles or alveolar sacs. As a result the alveolar sacs remain filled with air even after expiration. The exhalation becomes more difficult. The lungs remain inflated. Major causes of emphysema are cigarette smoking and the inhalation of smoke or other toxic substances
over a period of time.

Video Solution:

Q8 Text Solution:

100 mL of pure blood can carry approximately 20 mL of O2 under normal physiological conditions. This value can vary slightly depending on factors such as hemoglobin concentration and the partial pressure of oxygen.

Video Solution:

Q9 Text Solution:

1, 2, 5

Video Solution:

Q10 Text Solution:

- **A is correct**: **Cigarette smoking** is a major cause of emphysema.
- **B is correct**: **Alveolar walls are damaged**, reducing the respiratory surface.
- **C is incorrect**: **Wheezing** is more characteristic of **asthma**.
- **D is incorrect**: In emphysema, the **respiratory surface is decreased**, not increased.

Correct answer: **A and B only**.

Video Solution:

Q11 Text Solution:

Cardiac output is the volume of blood pumped by each ventricle per minute is called the cardiac output. It is determined by multiplying the heart rate with the volume of blood ejected by each ventricle during each beat, which is called as stroke volume. Cardiac output = Heart rate × Stroke volume. Thus, a person with heart rate of 72 beats/min and SV = 50 mL will have an output of = 72 beats/min × 50 mL/beat = 3600 mL/min.

Video Solution:

Q12 Text Solution:

Both statements are correct.

Heart, the mesodermally derived organ, is situated in the thoracic cavity, in between the two lungs, slightly tilted to the left. It has the size of a clenched fist. It is protected by a double walled membranous bag, pericardium, enclosing the pericardial fluid.

Video Solution:

Q13 Text Solution:

In fishes, the heart pumps out deoxygenated blood which is oxygenated by the gills and supplied to the body parts.

Video Solution:

Q14 Text Solution:

Coronary Artery Disease, often referred to as atherosclerosis, affects the vessels that supply blood to the heart muscle. It is caused by deposits of calcium, fat, cholesterol and fibrous tissues, which makes the lumen of arteries narrower.

Video Solution:

Q15 Text Solution:

12 – 16 mg.

Video Solution:

Q16 **Text Solution:**

Thrombins, in turn are formed from another inactive substance present in the plasma called prothrombin.

Video Solution:

Q17 **Text Solution:**

Globulins in human blood plasma are primarily involved in defence mechanisms of body.

Globulins like immunoglobulins act as antibodies that destroy bacteria, viruses and toxic substances that may enter into the blood from outside.

Video Solution:

Q18 **Text Solution:**

Systole of the left ventricle

Video Solution:

Q19 **Text Solution:**

If Rh− negative blood is exposed to Rh+ blood, the person with Rh− group will form specific antibodies against the Rh antigens. Therefore as a precaution Rh group should also be matched before blood transfusion or subsequent pregnancies in Rh− mothers.

Video Solution:

Q20 **Text Solution:**

The volume of both ventricle > the volume of both atria

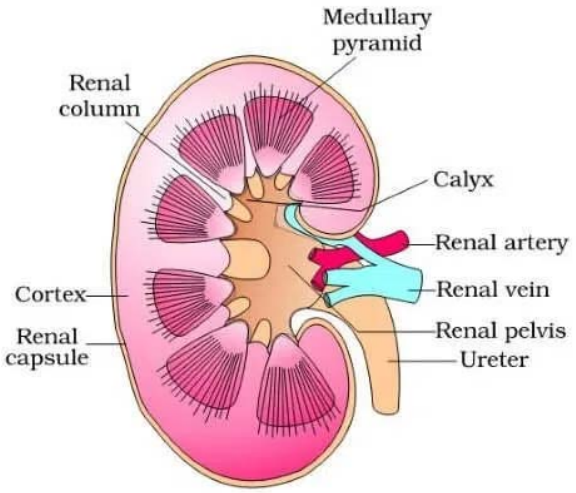
Video Solution:

Q21 **Text Solution:**

Juxta Glomerular Apparatus (JGA), a specialised portion of the nephrons, plays a significant role in the regulation of GFR. Fall in GFR activates JG cells to release renin which stimulates glomerular blood flow and brings GFR back to normal.

Video Solution:

Q22 Text Solution:



Longitudinal section (Diagrammatic) of Kidney

Video Solution:

Q23 Text Solution:

The descending limb of loop of Henle is permeable to water but almost impermeable to electrolytes. This concentrates the filtrate as it moves down. In the absence of the loop of Henle, the urine will be diluted.

Video Solution:

Q24 Text Solution:

From the Bowman's capsule, a glomerular filtrate enters the proximal convoluted tubule. Absorption of selected materials takes place from the filtrate into the blood of the peritubular capillaries or vasa recta. It is termed the tubular reabsorption. Reabsorption involves both passive and active transport across the tubular epithelium. About 65 per cent of the glomerular filtrate is normally reabsorbed in the proximal convoluted tubule before reaching the loop of Henle. Glucose, amino acids, vitamins, hormones, sodium, potassium, chlorides, phosphates, bicarbonates, much of water and some urea from the filtrate are absorbed. Sodium and potassium are reabsorbed by primary active transport.

Video Solution:

Q25 Text Solution:

ADH facilitates water reabsorption from latter parts of the tubule, thereby preventing diuresis. An increase in body fluid volume can switch off the osmoreceptors and suppress the ADH release to complete the feedback. ADH can also affect the kidney function by its constrictory effects on blood vessels. This causes an increase in blood pressure.

Video Solution:

Q26 Text Solution:

- The descending limb of loop of Henle is permeable to water but almost impermeable to electrolytes. This concentrates the filtrate as it moves down.
- The ascending limb is impermeable to water but allows transport of electrolytes actively or passively. Therefore, as the concentrated filtrate pass upward, it gets diluted due to the passage of electrolytes to the medullary fluid.

Video Solution:

Q27 Text Solution:

Tubular secretion is an important process in urine formation as it helps in the maintenance of ionic and acid-base balance of the body fluids. Rest of the statements are correct.

Video Solution:

Q28 Text Solution:

The epithelial cells of Bowman's capsule called podocytes are arranged in an intricate manner so as to leave some minute spaces called filtration slits or slit pores. Blood is filtered so finely through these membranes, that almost all the constituents of the plasma except the proteins pass onto the lumen of the Bowman's capsule. Therefore, it is considered as a process of ultra filtration.

Video Solution:

Q29 Text Solution:

Glycosuria	Presence of glucose in urine
Renal calculi	Mass of crystallised salts within the kidney
Glomerulonephritis	Inflammation in glomeruli
Uremia	Accumulation of urea in blood

Video Solution:

Q30 Text Solution:

Blood drained from a convenient artery is pumped into a dialysing unit after adding an anticoagulant like heparin. Anti-heparin, or anticoagulants like unfractionated heparin (UFH), are added to cleared blood before pumping it back to the body during hemodialysis to prevent blood clots from forming in the dialyzer's capillary fibers.

Video Solution: