



BIOLOGY

BOOKS - PRADEEP BIOLOGY (HINGLISH)

EXCRETORY PRODUCTS AND THEIR ELIMINATION

Notable Questions

1. What is the source of renin ?

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2. What is anhydrobiosis ?

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1. Define Glomerular Filtration Rate (GFR)

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2. Explain the autoregulatory mechanism of GFR.

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3. Indicate whether the following statements are true or false :

- (a) Micturition is carried out by a reflex.
- (b) ADH helps in water elimination, making the urine hypotonic.
- (c) Protein-free fluid is filtered from blood plasma into the Bowman's capsule.
- (d) Henle's loop plays an important role in concentrating the urine.
- (e) Glucose is actively reabsorbed in the proximal convoluted tubule.

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4. Give a brief account of the counter current mechanism.

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

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6. WHAT IS MICTURITION?

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7. Match the item of Column I with those of column II

Column I

- (i) Ammonotelism
- (ii) Bowman's capsule
- (iii) Micturition
- (iv) Uricotelism
- (v) ADH

Column II

- (a) Birds
- (b) Water reabsorption
- (c) Bony fish
- (d) Urinary bladder
- (e) Renal tubule

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8. What is meant by the term osmoregulation?

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9. Terrestrial animals are generally either ureotelic or uricotelic, not ammonotelic, why?

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10. What is the significance of juxtaglomerular apparatus (JGA) in kidney function?

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11. Find out the name of the following:

- a. A chordate animal having flame cells as excretory structures
- b. Cortical portions projecting between the medullary pyramids in the human kidney
- c. A loop of capillary running parallel to the Henle's loop

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12. Fill in the blanks:

- a. Ascending limb of Henle's loop ...⁽¹⁾... to water whereas the descending limb is ...⁽ⁱⁱ⁾... to it.

b. Reabsorption of water from distal parts of the tubule is facilitated by hormone ...(iii)...

c. Dialysing fluid contain all the constituents as in t] plasma except ... (iv)..

d. A healthy adult human excrete (on an average) ...(v)... of urea/day.

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Additional Questions Very Short Answer Type

1. What is the excretory system ment for ?

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2. Which part of the skeleton protects the kidneys ?

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3. where do the nephrons discharge their urine ?

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4. From where the pelvis receives urine ?

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5. What is loop of Henle ?

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6. Which part of the nephron adds some materials to the filtrate ?

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7. Name the enzyme produced by kidney to convert angiotensinogen to angiotensin.

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8. What is Malpighian body ?

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9. Name the reservoir of urine in the body.

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10. WHAT IS MICTURITION?

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11. What difference is observed in the ascending and the descending limbs of Henle's loop regarding permeability to H_2O ?

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12. Name the excretory organs of a tapeworm.

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13. What is the special structural feature of brush-bordered cubical cells of proximal tubules of the nephrons ?

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14. "Longer the loop of Henle more hypertonic is the urine produced."
Is this statement true or false ? If false, rewrite it correctly.

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15. Glomerular filtrate has water, glucose, amino acids and creatine.

Which of them are rapidly reabsorbed actively by blood ?

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16. Both the thin and thick segments of the ascending limb of loop of Henle transport NaCl out to the interstitial fluid. What is difference in their respective mode of transport?

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17. If, for any reason, the release of ADH is inhibited, how will this affect the volume of urine produced ?

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18. What is the excretory product from kidneys of reptiles?

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19. What is the composition of sweat produced by sweat glands?

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20. Identify the glands that perform the excretory function in prawns.

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Additional Questions Short Answer Type

1. How is urea formed in the animal body ?

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2. What is the exogenous source of nitrogenous waste material ?

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3. Name the 3 common nitrogenous waste materials in vertebrates.

Which of these is most toxic and which least toxic ?

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4. How do pigments gather in the body ? Are they excreted ? If, so how ?

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5. In what ways does the animal body gain water ?

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6. What is trigonum vesicae ?

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7. Name the basic nitrogenous catabolite of proteins produced in a whale. In what form is it eliminated from the body ? What are the conditions necessary for this kind of excretion ?

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8. How do lungs help in excretion ?

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9. Mention any two characteristics of ammonia as a nitrogenous metabolic waste. Which of the following animals is/are ammoniotelic ?

Camel, Whale, Shark, Frog.

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10. What are ureotelic animals ? Which of the following are ureotelic ?

Hydra, Frog, Cockroach, Man, birds.

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11. Name the basic nitrogenous catabolite of proteins produced in birds. In what form is it eliminated from the body ? What is the advantage of this type of excretion.

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12. Give the source and role of renin.

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13. What are the two modes of tubular reabsorption from the nephrons ? Name the materials absorbed by these modes.

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14. What are ammonotelic animals ? Give two examples.

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15. What is an artificial kidney ?

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16. Give two examples of each of the following :

(i) Ammonotelic animals (ii) Osmoconformers (iii) Ureotelic animals

(iv) Osmoregulators (v) Uricotelic animals



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17. Name the excretory organ present in the following animals : (i) Earthworm (ii) Centipedes (iii) Prawn (iv) Star fish (v) Man (vi) Flat worms



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18. Pick the odd ones in each of the following groups and select the correct option

(i). Renal pelvis, Medullary pyramid, Renal cortex, Renal papilla

(ii). Afferent arteriole, Henle's loop, Vasa recta, Efferent arteriole

(iii). Glomerular filtration, antidiuretic hormone, Hypertonic urine, collecting duct

(iv). Proximal convoluted tubule, distal convoluted tubule, Henle's loop, Renal corpuscle



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19. Name two actively transported substances in glomerular filtrate.

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20. Mention any two metabolic disorders, which can be diagnosed by analysis of urine.

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Additional Questions Short Answer Questions

1. What are the main processes of urine formation ?

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2. Compare and contrast the osmoregulatory problems and adaptations of a marine bony fish with a fresh water bony fish.

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3. State the importance of countercurrent systems in renal functioning.

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4. State the position and function of juxtaglomerular apparatus.

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5. State the normal and abnormal constituents of human urine.

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6. Write a short account on haemodialysis.

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7. State the roles of skin and lungs in excretion.

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8. Write down the functions of kidney.

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9. Name the various organs involved in excretion. Mention the materials excreted by each.

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10. Classify the animals on the basis of excretory material.

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11. Where do ultrafiltration, reabsorption and secretion occur in a nephron ?

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12. How do urea and urine differ ? Where are they formed ?

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13. State the normal and abnormal constituents of human urine.

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14. Explain the process of micturition.

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15. Mention the various kinds of excretory organs of invertebrates.

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16. Explain how osmoregulation occurs in Amoeba.

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17. Describe the mechanism of ultrafiltration in Bowman's capsule.

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18. Mention the factors that favour ultrafiltration in Bowman's capsule.

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19. In what forms are nitrogenous wastes excreted in birds, humans and fishes? Why do they do so differently?

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20. Describe glomerular filtration in human nephrons.

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21. Draw a simple diagram of a human nephron. Label any six parts.

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22. Differentiate between osmoregulators and osmoconformers.

Under which category will you place Hagfish ?

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23. Describe how the loop of Henle helps in concentrating the urine in terrestrial mammals.

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24. Fill in the blanks :

(i) Annelids have.....and insects have.....for excretion.

(ii) Organisms that show changes in the concentration of body fluids according to the concentration of surrounding medium are called.....and those which maintain an internal osmolarity different from the surrounding medium in which they live are called..... .

(iii) Sharks and coelacanths reduce the osmoregulatory challenges by

retaining.....and.....respectively in their body fluids making them slightly hypertonic to sea water.

(iv) In earthworm, depending upon their position, septal nephridia are.....and pharyngeal nephridia are..... .

(v) Blood enters the glomerulus via.....arteriole and leaves via....arteriole.

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25. Match the item in Column-I with appropriate item (one or more) given in Column-II.

Column I

- (i) Loop of Henle
- (ii) Glomerulus
- (iii) Vasa recta
- (iv) ADH hormone
- (v) Ureotelism

Column II

- (a) Counter current system
- (b) Hypertonic urine
- (c) Urine concentration
- (d) Ultrafiltration
- (e) Frog
- (f) Shark

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26. Fill in the blanks with appropriate words :

(a) During micturition, the urinary bladderand the urethral sphincters

(b) Flame cells and malpighian tubules are found in And....., respectively.

(c) Blood enters the glomerulus througharteriole and leaves via the.....arteriole.

(d) Two counter-current systems are formed in the kidney by theand the..... .

(e) Sweat serves to eliminate mainlyand..... .



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27. Match the items of column I with those of column II :

Column I

- (i) Ammoniotelism
- (ii) Bowman's capsule
- (iii) Micturition
- (iv) Uricotelism
- (v) Vasa recta
- (vi) Sebum
- (vii) ADH
- (viii) Tubular reabsorption

Column II

- (a) Birds
- (b) Hypertonic urine
- (c) Counter-current system
- (d) Bony fish
- (e) Urinary bladder
- (f) Glucose
- (g) Glomerular filtration
- (h) Skin



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28. Indicate whether the following statements are true or false :

- (a) Micturition is carried out by a reflex.
- (b) ADH helps in water elimination making the urine hypotonic.
- (c) Protein-free fluid is filtered from blood plasma into the Bowman's capsule.
- (d) Henle's loop plays an important role in concentrating the urine.
- (e) Glucose is actively reabsorbed in the proximal convoluted tubule.



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29. Show the structure of a renal corpuscle with the help of a diagram.

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30. What is the role played by renin - angiotensin in the regulation of kidney function?

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31. How have the terrestrial organisms adapted themselves for conservation of water?

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Additional Questions Long Answer Type

1. Where and how is urea produced in ureotelic animals ? What happens to the kidney filtrate in descending loop of Henle and collecting ducts ?

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2. Describe the structure of a human kidney with the help of a labelled diagram.

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3. Describe the functional anatomy of human nephron.

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4. Explain the following :

(a) Skin functions as an accessory organ.

(b) Mammals can eliminate hypotonic and hypertonic urine according to body needs.

(c) Micturition is a reflex process, but is under some voluntary control.

(d) Mammals are ureotelic, but birds are uricotelic.

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5. Briefly state the mechanism of urine formation in human kidney.

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6. Describe the hormonal feed back circuits in controlling renal functions.

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7. What is excretion ? Give an account of the excretory materials in animals.

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8. Give an account of kidney failure.

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9. Give the physical properties and chemical composition of urine.

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10. What is filtration pressure ? How is it developed ?

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11. Discuss how the kidneys help in osmoregulation in mammals.

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12. Describe the role of ADH and countercurrent system in forming hypertonic urine.

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13. Describe how urine is formed in the nephron through filtration, reabsorption and secretion.

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14. Describe the process of kidney transplantation.

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15. Distinguish between :

- (a) Ureotelism and uricotelism.
- (b) Sweat and sebum.
- (c) Proximal and distal convoluted tubules.
- (d) Ascending and descending limbs of Henle's loop.
- (e) Tubular reabsorption and tubular secretion.

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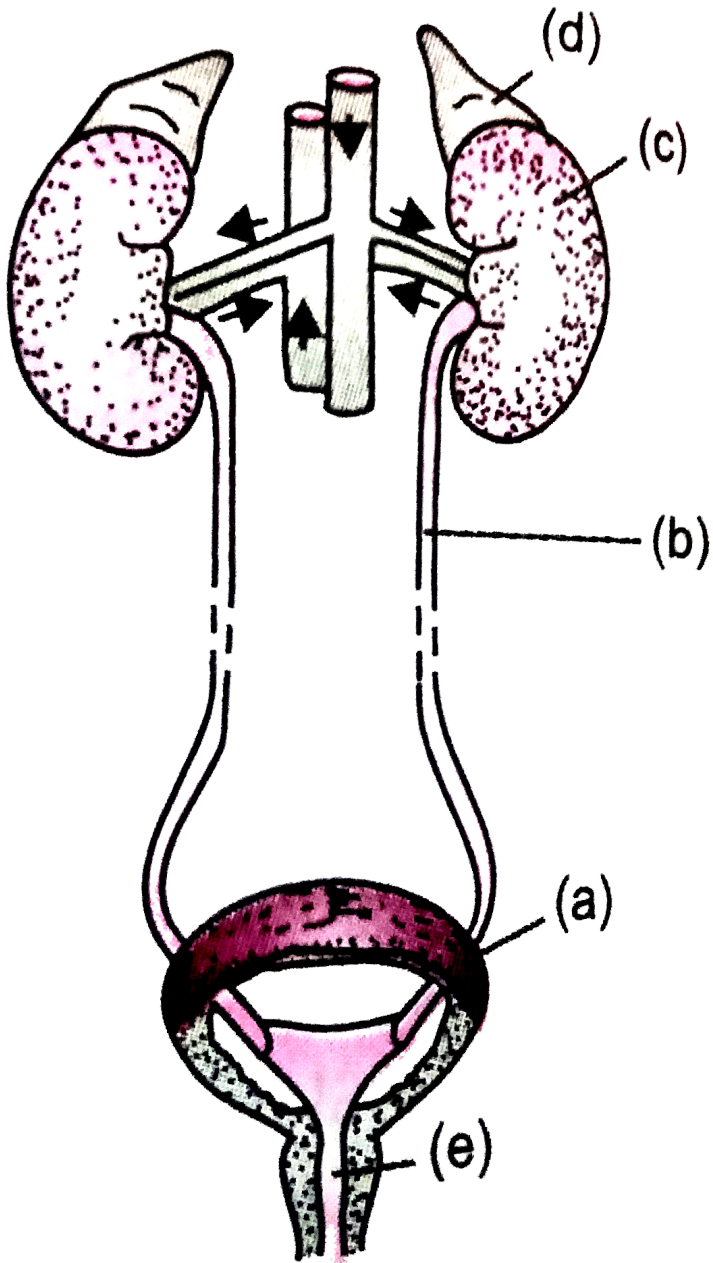
16. Sketch and label the excretory system of man.

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17. Study the given figure of excretory system of man carefully and answer the following questions :

- (i) Name the parts labelled as (a), (b), (c) (d) and (e)

(ii) Give one major function of each of these parts.



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18. Explain the mechanism of formation of concentrated urine in mammals.

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19. Explain briefly, micturition and disorders of the excretory system.

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Analytical Question With Answers

1. (a) What is meant by artificial kidney ? On which principle its works ?
(b) Can you suggest some safe and convenient alternative for renal failure patient ?

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2. Why is it not advisable to drink lot of water after heavy sweating ?

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3. Why is sweat produced ?

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4. What is meant by renal failure. ? Mention some of its causes. How can we conveniently treat a patient having renal failure ?

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5. What is renal calculus or kidney stone ? How cans stone be removed from the kidney ?

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6. An aquarium fish and a pigeon were fed on protein diet. In what different forms would they excrete their nitrogenous wastes ? Why do they excrete so differently.

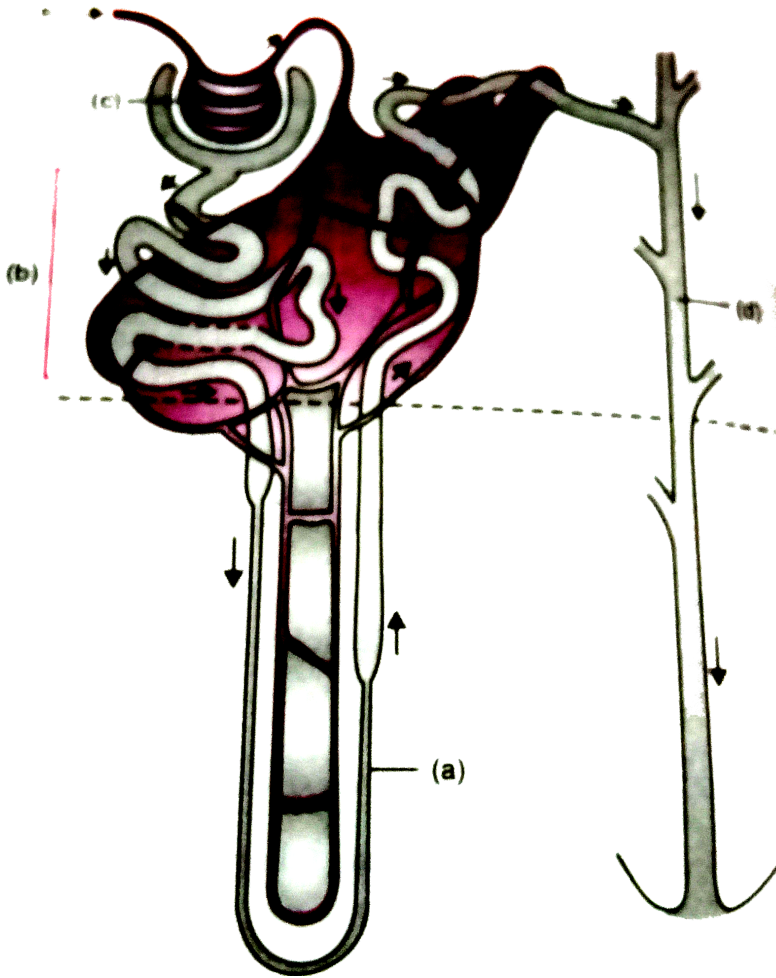
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7. What happens to the walls of distal convoluted tubule (DCT) of a nephron when vasopressin is released by pituitary into the blood stream ?

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8. (i) Study the given figure carefully and label the parts given as (A), (b), (c), (d) and (e).

(ii) Give one major function of each of these.



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9. What is spongiome ?

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10. What are osmoconformers and osmoregulators ? Give examples of each of them. How do they maintain osmotic condition of their body fluids ?

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11. Correctly match the organisms with the excretory organs they possess from the given list :

flatworms, earthworm, cockroach, Ascaris, prawn, molluscs kidneys, green glands, flame cells, malpighian tubules, nephridia, H-shaped canals and canaliculi.

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12. Give the major nitrogenous excretory product which the following organisms excrete ?

Hydra, cartilaginous fishes, insects, mammals, land snails, frog, bonyfishes, turtles, land reptiles, earthworm, starfish.

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13. Why does the body deaminate excess amino acids ?

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14. From which components of nephron, the following substances are absorbed in maximum and by which mechanism (active/passive transport) ?

Glucose, amino acids, inorganic ions (Na^+ , Cl^- , K^+), Urea

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15. Why have birds and mammals evolved countercurrent mechanism to excrete hypertonic urine ? What are the components of this countercurrent mechanism ? How it works ?

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16. Why is it not advisable to drink lot of water after heavy sweating ?

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17. How does ADH regulate body fluid volume ? Explain.

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18. How does aldosterone from the adrenal cortex regulate reabsorption of sodium to maintain homeostasis ?



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19. What technical terms are used when following materials are present in the urine ?

glucose, protein, blood, ketone bodies and pus.

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20. How much water is needed by animals to eliminate 1 gram of (i) ammonia, (ii) urea, and (iii) uric acid ?

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Practicle Questions I Multiple Choice Questions

1. A person is undergoing prolonged fasting. His urine will be found to contain abnormal quantities of

A. fats

B. amino acids

C. glucose

D. ketones

Answer: D



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2. The net pressure gradient that causes the fluid to filter out of the glomeruli into the capsule is -

A. 50 mm Hg

B. 75 mm Hg

C. 20 mm Hg

D. 30 mm Hg

Answer: C



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3. In Ornithine cycle which one pair of the following wastes as removed from the blood?

- A. CO_2 and urea
- B. ammonia and urea
- C. CO_2 and ammonia
- D. urea and urine

Answer: C



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4. Which one is component of ornithine cycle

A. ornithine, citrulline and alanine

B. ornithine, citrulline and arginine

C. ornithine, alanine and fumaric acid

D. ornithine, citrulline and fumaric acid

Answer: B



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5. Sea gulls excrete excess of NaCl from

A. liver

B. lungs

C. nasal cavity

D. kidney

Answer: C

6. Which one of the following statements is correct with respect to salt water balance inside the body of living organisms

A. when water is not available, camels do not produce urine but store urea in tissues

B. Salmon fish excretes lot of stored salt through gill membrane

C. Paramecium discharges concentrated salt solution by contractile vacuoles

D. The body fluids of fresh water animals are generally hypotonic to surrounding water.

Answer: A

7. Earthworms are

- A. ammonotelic when plenty of water is available
- B. ureotelic when plenty of water is available
- C. uricotelic when plenty of water is available
- D. uricotelic under conditions of water scarcity

Answer: A

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8. Bowman's glands are found in

- A. juxtamedullary nephrons
- B. olfactory epithelium
- C. external auditory canal
- D. cortical nephrons only

Answer: B



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9. Angiotensinogen is a protein produced and secreted by

A. juxtamedullary cells

B. macula dense cells

C. endothelial cells (cells lining the blood vessels)

D. liver cells

Answer: D



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10. Podocytes are the cells present in

- A. cortex of nephron
- B. inner wall of Bowman's capsule
- C. outer wall of Bowman's capsule
- D. wall of glomerular capillaries

Answer: B

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11. Malpighian tubules are

- A. excretory organs of insect
- B. excretory organs of frog
- C. respiratory organs of insects
- D. endocrine glands of insects

Answer: A

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12. Almost all the aquatic animals excrete ammonia as the nitrogenous waste product. Which of the following statement is not in agreement with this situation

- A. ammonia is easily soluble in water.
- B. ammonia is released from the body in a gaseous state.
- C. ammonia is highly toxic and needs to be eliminated as and when formed.
- D. ammonia gets converted into a less toxic form called urea.

Answer: B

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13. Which of the following is concerned with the formation of urea in rabbit ?

- A. blood
- B. kidney
- C. spleen
- D. liver

Answer: D



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14. Green glands present in some arthropods help in

- A. respiration
- B. excretion
- C. digestion

D. reproduction

Answer: B

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15. Loop of Henle is found in

A. lung

B. liver

C. neuron

D. nephron

Answer: D

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16. Nitrogenous waste products are eliminated mainly as

- A. urea in tadpole and uric acid in adult frog
- B. urea in adult frog and ammonia in tadpole
- C. urea in tadpole as well as in adult frog
- D. urea in tadpole and ammonia in adult frog

Answer: B

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17. Deamination occurs in :

- A. kidney
- B. liver
- C. nephron
- D. both (a) and (b)

Answer: B

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18. Bidder's canal occurs in

- A. testes of frog
- B. kidney of frog
- C. kidney of rabbit
- D. both (a) & (c)

Answer: B

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19. Excretory product of spider is

A. uric acid

B. ammonia

C. guanine

D. none of these

Answer: C



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20. ADH acts on

A. collecting tubule of kidney

B. loop of Henle

C. collecting ducts of testes

D. none of these above

Answer: A

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21. Which one of the following is metabolic waste of protein metabolism

- A. Urea, oxygen and N_2
- B. Urea, NH_3 and CO_2
- C. Ammonia, urea and creatinine
- D. Nitrogen, urea and CO_2

Answer: C

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22. Graham's law is correlated with

- A. Diffusion

B. Osmoregulation

C. Osmosis

D. Adsorption

Answer: A

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23. Which of the following is correct ?

A. Water reabsorption in descending limb of loop and collecting duct occur under similar conditions.

B. Sodium reabsorption in ascending limb of loop and collecting duct occur under similar conditions

C. Water reabsorption in descending limb of loop and collecting duct occur under different conditions

D. Water reabsorption in descending limb and sodium reabsorption in ascending limb of loop occur under similar conditions

Answer: A

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24. Select the incorrect statement regarding mechanism of urine formation in man.

- A. the glomerular filtration rate is about 125 ml per minute
- B. tubular secretion takes place in the PCT
- C. aldosterone induces greater reabsorption of sodium
- D. the counter current system contribute in diluting the urine

Answer: D





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25. A bird excrete nitrogenous waste materials in the form

- A. Uric acid
- B. Ammonia
- C. Urea
- D. Amino acids

Answer: A



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26. Which of the following is correct with reference to haemodialysis

- A. Absorbs and resends excess of ions
- B. The dialysis unit has a coiled cellophane tube

- C. Blood is pumped back through a suitable artery after haemodialysis
- D. Anti-heparin is added prior to haemodialysis

Answer: B

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27. Match list I with list II choose the correct option.

List I

(Organism)

- 1. Cockroach**
- 2. *Clarias***
- 3. Earthworm**
- 4. *Balanoglossus***
- 5. Flatworm**

List II

(Excretory structures)

- A. Nephridia**
- B. Malpighian tubules**
- C. Kidney**
- D. Flame cells**
- E. Proboscis gland**

A. 1 – A, 2 – C, 3 – B, 4 – D, 5 – E

B. 1 – C, 2 – A, 3 – B, 4 – E, 5 – D

C. 1 – B, 2 – A, 3 – C, 4 – E, 5 – D

D. 1 – B, 2 – A, 3 – E, 4 – C, 5 – D

Answer: D

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28. The substance present in higher concentration in blood than glomerular filtrate

- A. Urea
- B. Plasma proteins
- C. Water
- D. glucose

Answer: B

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29. A large quantity of fluid is filtered everyday by nephrons in the kidneys but only about 1% of it excreted as urine. The remaining 99% of the filtrate

- A. is stored in the urinary bladder
- B. is reabsorbed into the blood
- C. gets collected in the renal pelvis
- D. is lost as sweat

Answer: B

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30. Which of the following amino acids play important role in ornithine cycle ?

- A. glycine, methionine
- B. Arginine, methionine

C. Ornithine, citrulline

D. Citrulline, glucine

Answer: C

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31. Uric acid is the chief nitrogenous component of the excretory products of :

A. Frog

B. Man

C. Earthworm

D. Cockroach

Answer: D

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32. What will happen if the stretch receptors of the urinary bladder wall are totally removed ?

- A. There will no micturition
- B. Urine will not collect in the bladder
- C. Micturition will continue
- D. Urine will continue to collect normally in the bladder

Answer: C



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33. The following substances are the excretory products in animals.

Choose the least toxic from among them

- A. Urea
- B. Uric acid

C. Ammonia

D. Carbon dioxide

Answer: B



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34. Filtration of the blood takes place at

A. PCT

B. DCT

C. Collecting ducts

D. Malpighian body

Answer: D



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35. Which of the following statements is incorrect :

- A. ADH - prevents conversion of angiotensinogen in blood to angiotensin
- B. Aldosterone - facilitates water reabsorption
- C. ANF - check on RAAS mechanism
- D. Renin - causes vasoconstrictor

Answer: A



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36. A large quantity of one of the following is removed from our body by lungs.

- A. CO_2 only
- B. H_2O only

C. CO_2 and H_2O

D. ammonia

Answer: C

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37. The pH of human urine is approximately

A. 6.5

B. 7

C. 6

D. 7.5

Answer: C

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38. Different types of excretory structure and animals are given below

. Match them appropriately and mark the correct answer from among those given below .

Excretory structure/organ	Animals
A. Protonephridia	i. Prawn
B. Nephridia	ii. Cockroach
C. Malpighian tubules	iii. Earthworm
D. Green gland or Antennal gland	iv. Flatworms

A. $D - (i)$, $C - (ii)$, $B - (iii)$ and $(A) - (iv)$

B. $B - (i)$, $C - (ii)$, $A - (iii)$ and $(B) - (iv)$

C. $D - (i)$, $C - (ii)$, $A - (iii)$ and $(B) - (iv)$

D. $B - (i)$, $C - (ii)$, $B - (iii)$ and $(D) - (iv)$

Answer: A

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39. Which one of the following statements is incorrect ?

A. Birds and land snails are uricotelic animals.

B. Mammals and frogs are ureotelic animals

C. Aquatic amphibians and aquatic insects are ammonotelic animals

D. Birds and reptiles are ureotelic

Answer: D



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40. Which of the following pairs is wrong ?

A. Uricotelic Birds

B. Ureotelic Insects

C. Ammonotelic Tadpole

D. Ureotelic Elephant

Answer: B



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41. Which one of the following statements is incorrect ?

- A. The medullary zone of kidney is divided into a few conical masses called medullary pyramids projecting into the calyces.
- B. Inside the kidney the cortical region extends in between the medullary pyramids as renal pelvis.
- C. Glomerulus alongwith Bowman's capsule is called the renal corpuscle.
- D. Renal corpuscle, proximal convoluted tubule (PCT) and distal convoluted tubule (DCT) of the nephron are situated in the cortical region of kidney.

Answer: B



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42. The condition of accumulation of urea in the blood is termed as

- A. Renal calculi
- B. Glomerulonephritis
- C. Uremia
- D. Ketonuria

Answer: C



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43. Which one of the following is also known as antidiuretic hormone?

- A. Oxytocin
- B. Vasopressin
- C. Adrenaline
- D. Calcitonin

Answer: B

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44. Match the terms given in column I with their physiological processes given in column II and choose the correct answer.



- A. A-(iii), B-(v), C-(iv), D-(ii), E-(i)
- B. A-(iii), B-(iv), C-(i), D-(v), E-(ii)
- C. A-(i), B-(iii), C-(ii), D-(v), E-(iv)
- D. A-(iii), B-(i), C-(iv), D-(v), E-(ii)

Answer: B



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45. 

Match the abnormal conditions given in column A with their explanation given in column B and choose the correct options.

A. (A)-(i), B-(iii), C-(ii), D-(iv)

B. A-(iii), B-(ii), C-(iv), D-(i)

C. A-(iv), B-(iii), C-(ii), D-(i)

D. A-(iv), B-(ii), C-(iii), D-(i)

Answer: C



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46. We can produce concentrated? Dilute urine. This is facilitated by a special mechanism. Identify the mechanism.

- A. Reabsorption from PCT
- B. Reabsorption from Collecting Duct
- C. Reabsorption/Secretion in DCT
- D. Counter current mechanism in Henle's loop/Vasa recta

Answer: D

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47. Dialysing unit (artificial kidney) contains a fluid which is almost same as plasma except that it has

- A. High glucose
- B. High urea

C. No urea

D. High uric acid

Answer: B



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48. Which one of the following statements in regard to the excretion by the human kidneys is correct?

A. Ascending limb of loop of Henle is impermeable to electrolytes

B. Desending limb of loop of Henle is impermeable to water

C. Distal convoluted tubule is incapable of reabsorbing HCO_3^-

D. Nearly 99% of the glomerular filtrate is reabsorbed by the renal tubules.

Answer: D





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49. The principal nitrogenous excretory compound in humans is synthesised

- A. in the liver but eliminated mostly through kidneys
- B. in kidneys but eliminated mostly through liver
- C. in kidneys as well as eliminated by kidneys
- D. in liver and also eliminated by the same through bile

Answer: A



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50. In which of the following organisms, the excretory organs are correctly stated?

- A. Humans-kidneys, sebaceous glands and tear glands

- B. Earthworm-pharyngeal, integumentary and septal nephridia
- C. Cockroach-Malpighian tubules and enteric caeca
- D. Frog-kidney, skin and buccal epithelium

Answer: B

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51. In peritoneal dialysis

- A. the blood is not removed from the body and an artificial filter is used
- B. the blood is removed from the body and an artificial filter is employed
- C. the blood is removed from the body and a natural filter is employed

D. the blood is not removed from the body and a natural filter is used

Answer: D

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52. What is glycosuria ?

- A. low amount of sugar in urine
- B. low amount of fat in urine
- C. Average amount of carbohydrate in urine
- D. High amount of sugar in urine

Answer: D

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53. Volume of urine is regulated by

- A. aldosterone
- B. aldosterone and testosterone
- C. ADH
- D. aldosterone and ADH

Answer: D



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54. Name the condition when the conc. Of ketone body increases in urine

- A. Acromegaly
- B. Diabetes mellitus
- C. Diabetes insipidus

D. Cushing's disease

Answer: B

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55. This is not a nitrogenous waste

A. creatinine

B. purines

C. allantoin

D. citrulline

Answer: D

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56. Urea synthesis takes place primarily in liver because

- A. NH_3 and CO_2 are present in liver only
- B. hormone ADH is found in liver only
- C. enzyme arginase is present in liver only
- D. kidney is smaller than liver

Answer: C



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57. Which one of the following is not a part of a renal pyramid

- A. peritubular capillaries
- B. convoluted tubules
- C. collecting ducts
- D. loop of Henle

Answer: B



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58. Which one of the following correctly explains the function of a specific part of a human nephron?

- A. podocytes - create minute spaces (slit pores) for the filtration of blood into the Bowman's capsule
- B. Henle's loop - most reabsorption of the major substances from the glomerular filtrate
- C. distal convoluted tubule - reabsorption of K^+ ions into the surrounding blood capillaries
- D. afferent arteriole - carries the blood away from the glomerulus towards renal vein

Answer: A



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59. Which one of the following statement is correct respect to kidney function regulation

- A. when someone driks lot of water, ADH release is suppressed
- B. exposure to cold temperature stimulates ADH release
- C. an increase in glomerular blood flow stimulates formation of angiotensin II
- D. during summer when body loses lot of water by evaporation, the release of ADH is suppressed

Answer: A



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60. Uricotelic mode of passing out nitrogenous wastes is found in

- A. reptiles and birds
- B. birds and annelids
- C. amphibians and reptiles
- D. insects and amphibians

Answer: A



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61. Ureters act as urinogenital ducts in

- A. human males
- B. human demales
- C. both male and female frogs
- D. male frogs

Answer: D



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62. Loop of Henle is found in

- A. lung
- B. liver
- C. neuron
- D. nephron

Answer: D



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63. The maximum amount of electrolytes and water (70-80 per cent) from the glomerular filtrate is reabsorbed in which part of the

nephron?

- A. Ascending limb of loop of Henle
- B. Distal convoluted tubule
- C. Proximal convoluted tubule
- D. Descending limb of loop of Henle

Answer: C

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64. Which one of the following options gives the correct categorisation of animals according to the type of nitrogenous waste they give out?

A.

Ammonotelic	Ureotelic	Uricotelic
Pigeon, humans	Aquatic amphibia, lizards	Cockroach, frog

B.

Ammonotelic	Ureotelic	Uricotelic
Frog, lizards	Aquatic amphibia, humans	Cockroach, pigeon

C.

Ammonotelic	Ureotelic	Uricotelic
Aquatic amphibia	Frog, humans	Pigeon, lizards, cockroach

D.

Ammonotelic	Ureotelic	Uricotelic
Aquatic amphibia	Cockroach, humans	Frog, pigeon, lizards

Answer: C

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65. A fall in glomerular filtration rate (GFR) activates

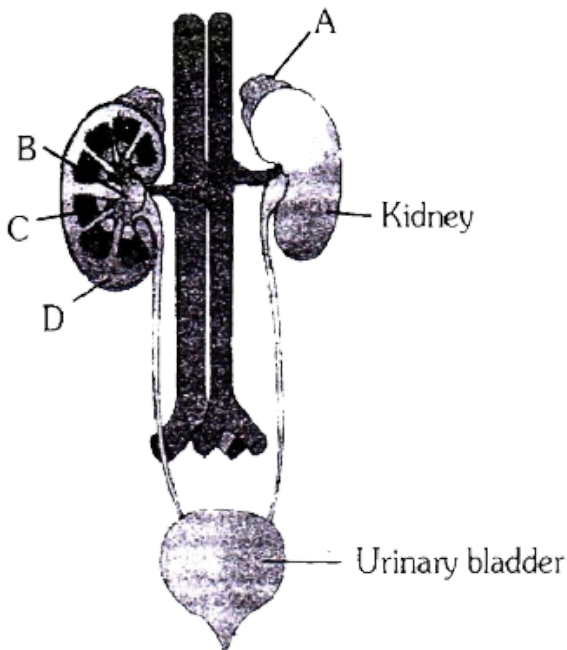
- A. juxtaglomerular cells to release renin
- B. adrenal cortex to release aldosterone
- C. adrenal medulla to release adrenaline

D. posterior pituitary to release vasopressin

Answer: A

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66. Figure shows human urinary system with structures labelled A to D. Select option which correctly identifies them and gives their characteristics and/or functions.



A. B - Pelvis - Broad funnel shaped space inner to hilum, directly connected to loops of Henle.

B. C - Medulla - Inner zone of kidney and contains complete nephrons.

C. D - Cortex - Outer part of kidney and do not contain any part of nephrons.

D. A - Adrenal gland - Located at the anterior part of kidney. Secrete catecholamines which stimulate glycogen breakdown.

Answer: D

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67. Which of the following causes an increase in sodium reabsorption in the distal convoluted tubule

A. Increase in aldosterone levels

B. Increase in antidiuretic hormone levels

C. Decrease in aldosterone levels

D. Decrease in antidiuretic hormone levels

Answer: A

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68. There is increase in blood urea when there is insufficient filtration in

A. loop of Henle

B. distal tubule

C. Bowman's capsule

D. collecting tubule

Answer: C





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69. Grafted kidney may be rejected in a patient due to:

- A. Innate immune response
- B. Humoral immune response
- C. Cell-mediated immune response
- D. Passive immune response

Answer: C



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70. Human urine is usually acidic because

- A. Hydrogen ions are actively secreted into the filtrate

- B. The sodium transporter exchanges one hydrogen ion for each sodium ion in peritubular capillaries
- C. Excreted plasma proteins are acidic
- D. Potassium and sodium exchange generates acidity

Answer: A

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71. What is true of urea biosynthesis

- A. Uric acid is starting point
- B. Urea is synthesised in lysosomes
- C. Urea cycle enzymes are located inside mitochondria
- D. Urea is synthesised in kidney

Answer: C

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72. In mammals, which blood vessel would normally carry largest amount of urea?

- A. Dorsal Aorta
- B. Hepatic Vein
- C. Hepatic Portal Vein
- D. Renal Vein

Answer: B

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73. Name the blood cells, whose reduction in number can cause clotting disorder, leading to excessive loss of blood from the body.

- A. Erythrocytes
- B. Leucocytes
- C. Neutrophils
- D. Thrombocytes

Answer: D

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74. 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

Answer: A::B::D

75. Match the items given in column I with those in column II and select the correct option given below.

Column I	Column II
A. Glycosuria	(i) Accumulation of uric acid in joints
B. Gout	(ii) Mass of crystallised salts within the kidney
C. Renal calculi	(iii) Inflammation in glomeruli
D. Glomerular nephritis	(iv) Presence of glucose in urine

A. *A B C D*
(iii) (ii) (iv) (i)

B. *A B C D*
(i) (ii) (iii) (iv)

C. *A B C D*
(ii) (iii) (i) (iv)

D. *A B C D*
(iv) (i) (ii) (iii)

Answer: D

76. Match the items given in column I with those in column II and select the correct option given below.

**Column I
(Function)**

**Column II
(Part of excretory
system)**

- | | |
|---------------------------|--------------------------------|
| A. Ultrafiltration | (i) Henle's loop |
| B. Concentration of urine | (ii) Ureter |
| C. Transport of urine | (iii) Urinary bladder |
| D. Storage of urine | (iv) Malpighian corpuscle |
| | (v) Proximal convoluted tubule |

A. *A B C D*
(iv) (v) (ii) (iii)

B. *A B C D*
(iv) (i) (ii) (iii)

C. *A B C D*
(v) (iv) (i) (ii)

D. *A B C D*
(v) (iv) (i) (iii)

Answer: B

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1. Assertion : In the descending limb of loop of Henle , the urine is hypertonic , while in ascending limb of loop of Henle , the urine is Hypotonic .

Reason : Descending limb is impermeable to Na^+ while ascending limb is impermeable to H_2O

- A. If both A and R are true and R is the correct explanation of A.
- B. If both A and R are true but R is not the correct explanation of A.
- C. If A is true but R is false.
- D. If both A and R are false.

Answer: A

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2. Assertion. The final reabsorption of water from the urine into the blood occurs through the collecting duct of a mammalian nephron resulting in the production of hyperosmotic urine.

Reason. The loop of Henle creates a sodium gradient in the interstitial fluid from the renal medulla towards the renal cortex.

- A. If both A and R are true and R is the correct explanation of A.
- B. If both A and R are true but R is not the correct explanation of A.
- C. If A is true but R is false.
- D. If both A and R are false.

Answer: A

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3. Assertion. Nephritis is the inflammation of kidney tissue.

Reason. Nephritis is usually caused by a viral infection.

- A. If both A and R are true and R is the correct explanation of A.
- B. If both A and R are true but R is not the correct explanation of A.
- C. If A is true but R is false.
- D. If both A and R are false.

Answer: C

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4. Assertion. The urinary bladder has a well developed, 3-layered detrusor muscle in its wall.

Reason. Bladder gradually contracts to drive urine out during micturition.

- A. If both A and R are true and R is the correct explanation of A.
- B. If both A and R are true but R is not the correct explanation of A.
- C. If A is true but R is false.

D. If both A and R are false.

Answer: A

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5. Assertion. Deamination takes place in the hepatocytes by oxidase by oxidase enzyme, producing NH_3 .

Reason. Ornithine cycle combines NH_3 and CO_2 to form urea in the adipocytes.

A. If both A and R are true and R is the correct explanation of A.

B. If both A and R are true but R is not the correct explanation of A.

C. If A is true but R is false.

D. If both A and R are false.

Answer: C

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6. Assertion. Kidneys are retroperitoneal organs.

Reason. Peritoneum covers the kidneys on all sides.

- A. If both A and R are true and R is the correct explanation of A.
- B. If both A and R are true but R is not the correct explanation of A.
- C. If A is true but R is false.
- D. If both A and R are false.

Answer: C

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7. Assertion. Urinary tract infection is less common in women than in men.

Reason. Urethra is longer in women than in men.

- A. If both A and R are true and R is the correct explanation of A.
- B. If both A and R are true but R is not the correct explanation of A.
- C. If A is true but R is false.
- D. If both A and R are false.

Answer: D

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8. Assertion. Tubular secretion alone accounts for excretion in the desert amphibians.

Reason. Desert amphibians have abundant Bowman's capsules and glomeruli.

- A. If both A and R are true and R is the correct explanation of A.
- B. If both A and R are true but R is not the correct explanation of A.
- C. If A is true but R is false.

D. If both A and R are false.

Answer: C

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Curiosity Questions

1. Why are amino acids deaminated in the body ?

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2. How do osmoregulation maintain osmolarity of their body fluids ?

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3. Why is urinary infection more common in women than in men ?

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4. What is the unpleasant odour of urine due to ?

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5. Why does a person doing strenuous work in summer passes out less urine?

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6. Why does the consumption of alcoholic beverages increase frequency of urination ?

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7. Why is taking a lot of water after heavy sweating not advisable ?



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