Shiksha Classes, Bhandara

Biology

Excretory Products And Their Elimination

(1.) The major forms of nitrogenous wastes excreted by animals is/are

(a.) ammonia (b.) urea

(c.) uric acid (d.) all of these

(2.) Choose the least toxic excretory product from the following.

(a.) Uric acid (b.) Urea

(c.) Ammonia (d.) Carbon dioxide

(3.) Choose the correct pair of ammonotelic animals from the following.

(a.) Bony fishes and birds (b.) Mammals and land snails

(c.) Aquatic amphibians and aquatic insects (d.) Reptiles and insects

(4.) Choose the incorrect pair from the following.

(a.) Ureotelic – insects (b.) Uricotelic – birds

(c.) Ureotelic – elephant (d.) Ammonotelic – tadpole

(5.) Which enzyme converts urea into ammonia?

(a.) Urease (b.) Amylase

(c.) Phosphatase (d.) None of these

(6.) Biuret test is performed for the confirmation of the presence of

(a.) urea (b.) lactic acid

(c.) CO_2 (d.) H_2O

(7.) Which test is performed to detect the presence of bile salts in the urine?

(a.) Lugol's iodine test (b.) Gmelin's test

(c.) Fouchet's test (d.) All of these

(8.) Match Column I with Column II and choose the correct option from the codes given below.

Column–I (Excretory Structure)	**Column–II (Organism)**
(A) Protonephridia	(1) Prawn
(B) Nephridia	(2) Cockroach
(C) Malpighian tubules	(3) Earthworm
(D) Green gland	(4) Flatworms

	A	B	C	D
(a.)	3	4	1	2
(b.)	4	3	2	1
(c.)	2	1	4	3
(d.)	1	2	3	4

(9.) The ureter enters into the kidney through

(a.) hilum (b.) calyces

(c.) nephron (d.) none of these

(10.) The functional unit of kidney is

(a.) renal pelvis (b.) column ofBertini

(c.) nephron (d.) none of these

(11.) Blood from the glomerulus is carried away by an/a

(a.) afferent arteriole (b.) efferent arteriole

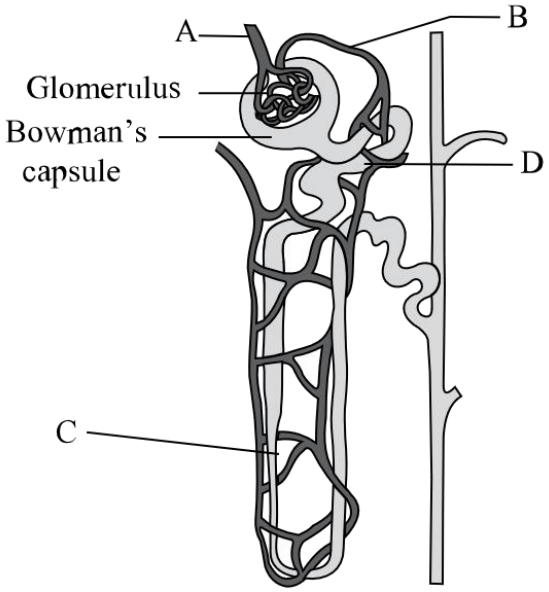
(c.) proximal convoluted tubule (d.) Henle's loop

(12.) Among the following which one is not the part of renal tubule?

(a.) Proximal convoluted tubule (b.) Distal convoluted tubule

(c.) Glomerulus (d.) Henle's loop

(13.) The given figure is a diagrammatic representation of a nephron. In the figure, some parts are labelled as A, B, C, and D. Choose the correct option from the following.



	A	B	C	D
(a.)	Afferent arteriole	Efferent arteriole	Henle's loop	Proximal convoluted tubule

(b.)

A	B	C	D
Efferent arteriole	Afferent arteriole	Proximal convoluted tubule	Henle's loop

(c.)

A	B	C	D
Henle's loop	Distal convoluted tubule	Afferent arteriole	Efferent arteriole

(d.)

A	B	C	D
Distal convoluted tubule	Afferent arteriole	Henle's loop	Efferent arteriole

(14.) Glomerulus along with Bowman's capsule is called the

(a.) Malpighian body
(b.) renal corpuscle
(c.) renal tubule
(d.) both (a) and (b)

(15.) Choose the incorrect statement from the following:

(a.) The medullary zone of kidney possesses a few conical masses called medullary pyramids that project into the calyces.
(b.) The cortical region of kidney extends in between the medullary pyramids as renal pelvis.
(c.) Glomerulus and Bowman's capsule collectively form the renal corpuscle.
(d.) Renal corpuscle, PCT and DCT of the nephron are situated in the cortical region of kidney.

(16.) Match Column I with Column II and choose the correct option from the codes given below.

Column–I	Column–II
(A) Glomerulus	(1) Carries blood away from the glomerulus
(B) Afferent arteriole	(2) Tuft of capillaries
(C) Efferent arteriole	(3) Encloses glomerulus
(D) Bowman's capsule	(4) Brings blood in the glomerulus

Codes

	A	B	C	D
(a.)	3	1	4	2
(b.)	2	4	1	3
(c.)	1	3	2	4
(d.)	4	2	3	1

(17.) The DCTs of many nephrons open into a straight tube called

(a.) collecting duct (b.) Henle's loop

(c.) glomerulus (d.) none of these

(18.) Nephrons in which the loop of Henle is very long and runs deep into the medulla are called

(a.) cortical nephrons (b.) juxta-medullary nephrons

(c.) medullary nephrons (d.) none of these

(19.) The arteriole that forms a fine capillary network around the renal tubule is

(a.) afferent arteriole (b.) vasa recta

(c.) efferent arteriole (d.) both (a) and (c)

(20.) Assertion: Reptiles are uricotelic animals.
Reason: Reptiles excrete nitrogenous wastes as uric acid

(a.) Both Assertion and Reason are true and Reason is correct explanation of Assertion. (b.) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.

(c.) Assertion is true, but Reason is false. (d.) Assertion is false, but Reason is true.

(21.) Assertion: Green glands are excretory structures.
Reason: These green glands are found in annelids.

(a.) Both Assertion and Reason are true and Reason is correct explanation of Assertion. (b.) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.

(c.) Assertion is true, but Reason is false. (d.) Assertion is false, but Reason is true.

(22.) Assertion: The Malpighian corpuscle, PCT and DCT of nephron are situated in the medullary region of the kidney.
Reason: The loop of Henle dips into the cortex of kidney.

(a.) Both Assertion and Reason are true and Reason is correct explanation of Assertion. (b.) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.

(c.) Assertion is true, but Reason is false. (d.) Assertion is false, but Reason is true

(23.) Urine formation involves

(a.) glomerular filtration (b.) reabsorption

(c.) secretion (d.) all the above

(24.) The filtration of blood occurs at

(a.) PCT (b.) DCT

(c.) collecting ducts (d.) Malpighian body

(25.) The epithelial cells of Bowman's capsule are called

(a.) podocytes (b.) osteocytes

(c.) endocytes (d.) none of these

(26.) GFR (Glomerular Filtration Rate) in a healthy individual is approximately

(a.) 190 ml/min (b.) 250 ml/min

(c.) 125 ml/min (d.) 50 ml/min

(27.) During ultrafiltration, all the constituents of the plasma pass into the lumen of the Bowman's capsule except

(a.) water (b.) proteins

(c.) electrolytes (d.) none of these

(28.) The amount of filtrate formed by the kidneys per minute is called

(a.) blood filtration rate (b.) filtration rate

(c.) urine formation rate (d.) glomerular filtration rate

(29.) Juxta Glomerular Apparatus (JGA) is a special sensitive region formed by the cellular modifications in

(a.) DCT and afferent arteriole (b.) PCT and efferent arteriole

(c.) DCT and efferent arteriole (d.) PCT and afferent arteriole

(30.) Match Column I with Column II and choose the correct option from the codes given below.

Column–I	Column–II
(A) Ultrafiltration	(1) Filtrate formed by kidneys per minute
(B) Podocytes	(2) Glomerulus
(C) GFR	(3) JG cells
(D) Renin	(4) Epithelial cells of Bowman's capsule

Codes

	A	B	C	D
(a.)	2	4	1	3
(b.)	3	1	2	4
(c.)	1	3	4	2
(d.)	4	2	3	1

(31.) The nitrogenous wastes are absorbed by the tubular epithelial cells through

(a.) active transport (b.) positive transport

(c.) passive transport (d.) none of these

(32.) Choose the incorrect statement from the following.

(a.) JGA is formed by cellular modifications in the DCT and the afferent arteriole at the location of their contact.

(b.) About 50% of the filtrate is reabsorbed by the renal tubules.

(c.) Reabsorption of water occurs passively in the initial segments of the nephron.

(d.) Tubular secretion is an important step in urine formation.

(33.) Match the items given in Column I with those in Column II and select the correct option from the codes given below.

Column–I (Function)	Column–II (Parts of excretory systems)
(A) Ultrafiltration	(1) Henle's loop
(B) Concentration of urine	(2) Ureter
(C) Transport of urine	(3) Urinary bladder
(D) Storage of urine	(4) Malpighian corpuscle
	(5) Proximal convoluted tubule

Codes

	A	B	C	D
(a.)	4	5	2	3
(b.)	4	1	2	3
(c.)	5	4	1	2
(d.)	5	4	1	3

(34.) The part of nephron involved in active reabsorption of sodium is

(a.) Bowman's capsule

(b.) Descending limb of Henle's loop

(c.) Distal convoluted tubule

(d.) Proximal convoluted tubule

(35.) Removal of proximal convoluted tubule from the nephron will result in

(a.) more concentrated urine

(b.) no change in quality and quality of urine

(c.) no urine formation

(d.) more diluted urine

(36.) The ascending limb of loop of Henle is impermeable to

(a.) electrolytes

(b.) water

(c.) NH_3

(d.) both (a) and (b)

(37.) Which of the following statements is correct?

(a.) The descending limb of loop of Henle is impermeable to water.

(b.) The ascending limb of loop of Henle is permeable to water.

(c.) The descending limb of loop of Henle is permeable to electrolytes.

(d.) The ascending limb of loop of Henle is impermeable to water.

(38.) The minimum reabsorption occurs at

(a.) proximal convoluted tubule (b.) Henle's loop

(c.) distal convoluted tubule (d.) collecting duct

(39.) Distal convoluted tubule (DCT) is responsible for

(a.) reabsorption of HCO_3^- (b.) conditional reabsorption of Na^+

(c.) selective secretion of H^+ and K^+ ions (d.) all of these

(40.) Match Column I with Column II and choose the correct option from the codes given below.

Column–I	Column–II
(A) Proximal convoluted tubule	(1) Formation of concentrated urine
(B) Distal convoluted tubule	(2) Filtration of blood
(C) Henle's loop	(3) Reabsorption of 70%–80% of electrolytes
(D) Counter–current mechanism	(4) Ionic balance
(E) Renal corpuscle	(5) Maintenance of concentration gradient in medulla

Codes

	A	B	C	D	E
(a.)	3	5	4	2	1
(b.)	3	4	1	5	2
(c.)	1	3	2	5	4
(d.)	3	1	4	5	2

(41.) Match the following parts of a nephron with their function.

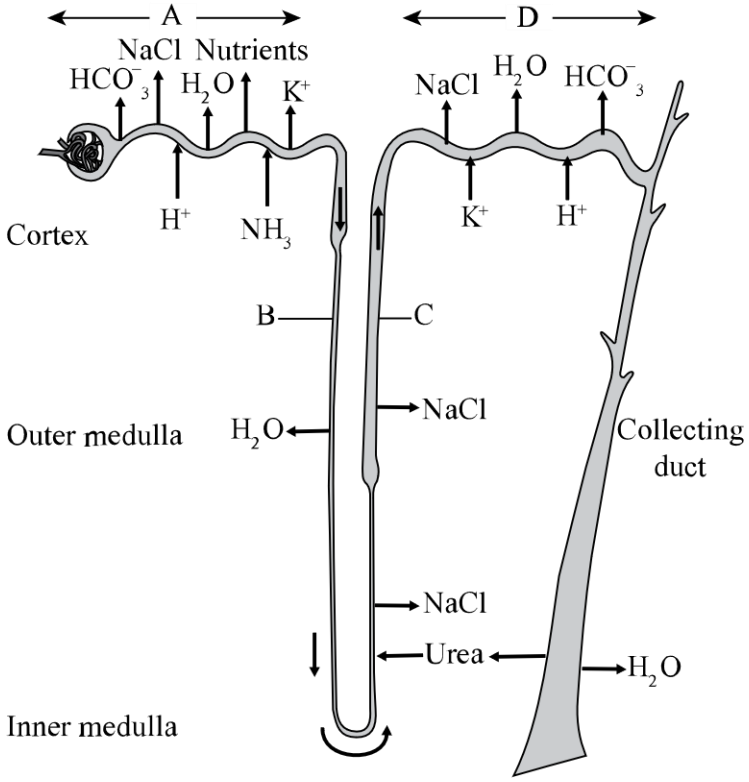
Column–I	Column–II
(A) Descending limb of Henle's loop	(1) Reabsorption of salts only
(B) Proximal convoluted tubule	(2) Reabsorption of water only
(C) Ascending limb of Henle's loop	(3) Conditional reabsorption of sodium ions and water
(d.) Distal convoluted tubule	(4) Reabsorption of ions, water and organic nutrients

	A	B	C	D
(a.)	4	1	3	2
(b.)	1	3	2	4
(c.)	2	4	1	3
(d.)	1	4	2	3

(42.) (21.) A large amount of water could be reabsorbed from this region to produce a concentrated urine

(a.) PCT
(b.) Henle's loop
(c.) glomerulus
(d.) collecting duct

(43.) Refer to the given figure showing reabsorption and secretion of major substances at different parts of the nephron. Some parts are labelled as A, B, C and D. Identify the part where conditional reabsorption of Na+ takes places.



(a.) B
(b.) A
(c.) C
(d.) D

(44.) Assertion: In the filtrated Na+, glucose are absorbed by passive transport.
Reason: The nitrogenous wastes are reabsorbed by active process.

(a.) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
(b.) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
(c.) Assertion is true, but Reason is false.
(d.) Assertion is false, but Reason is true.

(45.) Assertion: About 70%–80% of electrolytes and water are reabsorbed by PCT.
Reason: PCT is lined by simple cuboidal brunch border epithelium, which increases the surface area for reabsorption.

(a.) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
(b.) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
(c.) Assertion is true, but Reason is false.
(d.) Assertion is false, but Reason is true.

(46.) Assertion: Large amount of water could be reabsorbed by the collecting duct.
Reason: This duct extends from the cortex of the kidney to the inner parts of the medulla.

(a.) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
(b.) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
(c.) Assertion is true, but Reason is false.
(d.) Assertion is false, but Reason is true.

(47.) The part(s) that play(s) a significant role in the production of concentrated urine is/are

(a.) Henle's loop
(b.) Vasa recta
(c.) PCT
(d.) Both (a) and (b)

(48.) An increasing osmolarity toward the inner medullary interstitium is maintained by the

(a.) proximity between the Henle's loop and vasa recta
(b.) counter-current in the Henle's loop and vasa recta
(c.) proximity between PCT and DCT
(d.) both (a) and (b)

(49.) The gradient from cortex to medulla in kidneys is mainly caused by

(a.) NaCl
(b.) H_2O
(c.) Urea
(d.) Both (a) and (b)

(50.) (4.) Match Column I with Column II and choose the correct option from the codes gives below.

Column–I	Column–II
(A) Osmolarity in cortex	(1) NaCl
(B) Osmolarity in medulla	(2) 300 m Osmol L-1
(C) Transported by ascending limb of Henle's loop	(3) Urea
(D) Transported back to the interstitium by the collection tubule	(4) 1200 m Osmol L-1

Codes

	A	B	C	D
(a.)	2	4	1	3
(b.)	3	4	1	3
(c.)	4	2	3	1
(d.)	1	3	4	2

ANSWER

(1.)	d	**(2.)**	a	**(3.)**	c	**(4.)**	a	**(5.)**	a
(6.)	a	**(7.)**	d	**(8.)**	b	**(9.)**	a	**(10.)**	c
(11.)	b	**(12.)**	c	**(13.)**	a	**(14.)**	d	**(15.)**	b
(16.)	b	**(17.)**	a	**(18.)**	b	**(19.)**	c	**(20.)**	a
(21.)	c	**(22.)**	d	**(23.)**	d	**(24.)**	d	**(25.)**	a
(26.)	c	**(27.)**	b	**(28.)**	d	**(29.)**	a	**(30.)**	a
(31.)	c	**(32.)**	b	**(33.)**	b	**(34.)**	d	**(35.)**	d
(36.)	b	**(37.)**	d	**(38.)**	b	**(39.)**	d	**(40.)**	b
(41.)	c	**(42.)**	d	**(43.)**	d	**(44.)**	d	**(45.)**	a
(46.)	b	**(47.)**	d	**(48.)**	d	**(49.)**	d	**(50.)**	a

EXPLANATION

(1.) (d.) The major forms of nitrogenous wastes excreted by animals are ammonia, urea and uric acid. These are produced during metabolic activities and used to be removed partially or totally. Ammonia is the most toxic while uric acid is the least toxic nitrogenous waste.

(2.) (a.) Uric acid is the least toxic excretory product. It can be removed with a minimum loss of water. Animals that excrete uric acid are known as ureotelic animals, e.g., reptiles, birds, land snails and insects. They excrete uric acid in the form of pellet or paste.

(3.) (c.) The ammonotelic animals are bony fishes, aquatic amphibians and aquatic insects. These organisms excrete ammonia. This ammonia is readily soluble in water and is generally excreted by diffusion across body surfaces or through gill surfaces (in fish) as ammonium ions.

(4.) (a.) Insects are uricotelic not ureotelic as they excrete uric acid. It is the least toxic excretory product that can be removed with minimum loss of water. Insects secrete uric acid in the form of pellet or paste.

(5.) (a.) The enzyme urease converts urea into ammonia. This is a specific test for urea because enzyme urease shows its specificity for the substrate urea.

$$\underset{\text{Urea (neutral)}}{(NH_2)CO} \xrightarrow[Na_2CO_3]{\text{Urease}} (NH_4)_2CO_3 \xrightarrow{\text{Heating}} 2NH_3 + H_2CO_3 \xrightarrow{+H_2O} NH_4OH$$

Ammonia is the product of deamination of amino acids.

(6.) (a.) Biuret test is performed for the confirmation of the presence of urea. Urea when heated decomposes with liberation of ammonia and the formation of biuret.

(7.) (d.) All the given tests, i.e., Lugol's iodine test, Gmelin's test and Fouchet's test are performed to detect the presence of bile salts in the urine.

(8.) (b.) Protonephridia are excretory organs found in flatworms. Nephridia are tubular excretory organs. These are found in earthworm. Malpighian tubules are excretory organs of cockroaches. These tubules help in the removal of nitrogenous wastes and osmoregulation. Green glands perform the excretory function in crustaceans like plawns.

(9.) (a.) The ureter enters into the kidney through hilum. Kidneys are reddish brown, bean-shaped structures situated between the levels of last thoracic and third lumber vertebra close to the dorsal inner wall of the abdominal cavity.

(10.) (c.) The functional unit of kidney is nephron. Each nephron consists of a glomerulus and a renal tubule. The glomerulus is a tuft of capillaries. The renal tubule begins with a double walled cuplike structure called Bowman's capsule which encloses the glomerulus.

(11.) (b.) Blood from the glomerulus is carried away by an efferent arteriole. Glomerulus is a tuft of capillaries formed by the afferent arteriole. This afferent arteriole is a fine branch of renal artery. The glomerulus and the renal tubule collectively form the nephron which is the structural and functional unit of kidney.

(12.) (c.) Glomerulus is not the part of renal tubule. Both of them, i.e., glomerulus and renal tubule, collectively form the nephron. Proximal convoluted tubule, Henle's loop and distal convoluted tubule all are parts of renal tubule.

(13.) (a.) In the given figure,

A – Afferent arteriole

B – Efferent arteriole

C – Henle's loop

D – Proximal convoluted tubule

(14.) (d.) Glomerulus along with Bowman's capsule is called the Malphigian body or renal corpuscle. Bowman's capsule encloses the glomerulus which is a tuft of capillaries. This

glomerulus is formed by afferent arteriole – a fine branch of renal artery. Blood from the glomerulus is carried away by an efferent arteriole.

(15.) (b.) The statement (b.) is incorrect. The cortical region of kidney extends in between the medullary pyramids as renal columns. These renal columns are known as column of Bertini. Rest of the statements are correct.

(16.) (b.) Bowman's capsule enclosed the glomerulus. This glomerulus is a tuft of capillaries formed by the afferent arteriole. The afferent arteriole brings blood in the glomerulus, while blood from the glomerulus is carried away by an efferent arteriole.

(17.) (a.) The DCTs of many nephrons open into a straight tube called collecting duct. Henle's loop, proximal convoluted tubule and distal convoluted tubule are the part of renal tubule. Glomerulus is the tuft of capillaries.

(18.) (b.) Nephrons in which the loop of Henle is very long and runs deep into the medulla are called juxtamedullary nephrons. In majority of the nephrons, the loop of Henle is too short and extends only very little into the medulla.

(19.) (c.) The arteriole that forms a fine capillary network around the renal tubule is efferent arteriole. It (efferent arteriole) emerges from the glomerulus. This fine capillary network is called the peritubular network. A minute vessel of this network runs parallel to the Henle's loop forming a 'U' shaped vasa recta. It is absent or highly reduced in cortical nephrons.

(20.) (a.) Reptiles are called uricotelic animals because they excrete their nitrogenous wastes as uric acid. This uric acid is the least toxic excretory waste and can be removed with a minimum loss of water. Uricotelic animals excrete nitrogenous wastes as uric acid in the form of pellet or paste.

(21.) (c.) Green glands perform the excretory function in crustaceans like prawns. These are known as antennal glands also. In annelids, excretion occurs through nephridia which are tubular structures. They help to remove nitrogenous wastes as well as maintain a fluid and ionic balance.

(22.) (d.) The Malpighian corpuscle, PCT and DCT of nephron are situated in the cortical region of the kidney, whereas the loop of Henle dips into the medulla. Therefore, both the assertion and reason are incorrect.

(23.) (d.) Urine formation involves all the given processes, i.e., glomerular filtration, reabsorption and recreation. All these processes occur in different parts of the nephron. Glomerular filtration occurs in glomerulars while reabsorption and secretion occur in renal tubule.

(24.) (d.) The filtration of blood occurs at Malpighian body. The glomerular capillary blood pressure causes filtration of blood. It occurs through three layers, i.e., the endothelium of glomerular blood vessels, the epithelium of Bowman's capsule and a basement membrane between these two layers. This process of filtration is known as ultrafiltration.

(25.) (a.) The epithelial cells of Bowman's capsule are called podocytes. These cells are arranged in an intricate manner so as to leave some minute spaces called filtration slits or slit pores.

(26.) (c.) The Glomerular Filtration Rate (GFR) in a healthy individual is approximately 125 mL/min, i.e., 180 litres per day. GFR is the amount of the filtrate formed by the kidneys per minute. About 90% of the filtrate is reabsorbed by the renal tubules.

(27.) (b.) During ultrafiltration, all the constituents of the plasma pass onto the lumen of the Bowman's capsule except proteins. This ultrafiltration is therefore named so. It occurs through glomerulus. On an average, 1100–1200 mL of blood is filtered by the kidneys per minute.

(28.) (d.) The amount of filtrate formed by the kidneys per minute is called Glomerular Filtration Rate (GFR). This GFR in a healthy individual is approximately 125 mL/minute, i.e., 180 litres per day.

(29.) (a.) Juxta Glomerular Apparatus (JGA) is a special sensitive region formed by the cellular modifications in the distal convoluted tubule (DCT) and the afferent arteriole at the location of their contact. A fall in GFR can activate the JG cells to release renin. This renin stimulates the glomerular blood flow and thereby the GFR back to normal.

(30.) (a.) The first step in the urine formation is filtration of blood which is carried out by the glomerulus. It is called ultrafiltration. The epithelial cells of Bowman's capsule are arranged in an intricate manner so as to leave some minute spaces filtration slits. These epithelial cells are called podocytes. The amount of filtrate formed by the kidneys per minute is called glomerular filtration rate (GFR). JG cells release renin which helps in keeping the GFR to normal.

(31.) (c.) The nitrogenous wastes are absorbed by the tubular epithelial cells through passive transport. Reabsorption occurs in renal tubules. Some substances are absorbed by active transport, e.g., glucose, amino acids, Na+, etc.; while some are absorbed by passive transport, e.g., nitrogenous wastes.

(32.) (b.) A comparison of the volume of the filtrate formed per day, i.e., 180 litres per day, with that of urine released, i.e., 1.5 litres, suggest that nearly 99% of filtrate has to be reabsorbed by the renal tubules. This process is known as reabsorption. This is performed by the epithelial cells of the renal tubule.

(33.) (b.) The first step of urine formation is ultrafiltration, which occurs in Malpighian corpuscle. Henle's loop plays an important role in the concentration of urine by counter-current mechanism. Ureters are responsible for the transportation of urine to the transportation of urine to the urinary bladder where it is stored for some time.

(34.) (d.) The part of nephron involved in active reabsorption of sodium is proximal convoluted tubule (PCT). It is lined by simple cuboidal brush border epithelium which increases the surface area for reabsorption. PCT also helps to maintain the pH and ionic balance of the body fluids.

(35.) (d.) Removal of proximal convoluted tubule from the nephron will result in more diluted urine. Nearly all of the essential nutrients and 70%–80% of electrolytes and water are reabsorbed by this segment. PCT is lined by simple cuboidal brush border epithelium which increases the surface area for reabsorption.

(36.) (b.) The ascending limb of loop of Henle is impermeable to water. However, it allows transport of electrolytes actively or passively. Reabsorption is minimum in Henle's loop, but it plays an important role in the maintenance of high osmolality of medullary interstitial fluid.

(37.) (d.) Statement (d.) is correct for Henle's loop. The ascending limb of loop of Henle is impermeable to water but allows transport of electrolytes actively or passively. Therefore, as the concentrated filtrate passes upward, it gets diluted due to the passage of electrolytes to the medullary fluid.

(38.) (b.) The minimum reabsorption occurs at Henle's loop. This region plays a significant role in the maintenance of high osmolarity of medullary interstitial fluid. The descending limb of loop of Henle is permeable to water but almost impermeable to electrolytes. The ascending limb is impermeable to water but allows transport of electrolytes actively or passively.

(39.) (d.) In distal convoluted tubule, conditional reabsorption of Na+ and water takes place. DCT is also capable of reabsorption of HCO_3^- and selective secretion of H+ and K+ ions. It maintains pH and sodium-potassium balance in blood.

(40.) (b.) About 70%–80% reabsorption of electrolytes occurs in proximal convoluted tubule during urine formation. Distal convoluted tubule helps in maintaining the ionic balance. Henle's loop is responsible for the concentration of urine. It is accomplished by counter-current mechanism. This maintains the concentration gradient in medulla. In renal corpuscle filtration of blood is carried out.

(41.) (c.) During filtration, maximum reabsorption occurs at Proximal Convoluted Tubule (PCT). In PCT ions, water and organic nutrients are reabsorbed. In the descending limb of Henle's loop reabsorption of water occurs while in its ascending limb salts are reabsorbed. In Distal Convoluted Tubule (DCT) conditional reabsorption of sodium ions and water occurs.

(42.) (d.) A large amount of water could be reabsorbed from the collecting duct to produce a concentrated urine. This duct extends from the cortex of the kidney to the inner parts of the medulla.

(43.) (d.) In the given figure,

A – Proximal convoluted tubule

B – Descending limb of loop of Henle

C – Thick segment of ascending limb of loop of Henle

D – Distal convoluted tubule The conditional reabsorption of Na^+ takes place at distal convoluted tubule.

(44.) (d.) Both assertion and reason are incorrect. Substances like glucose, amino acids, Na^+, etc., in the filtrate are reabsorbed actively whereas the nitrogenous wastes are absorbed by passive transport. Reabsorption occurs by tubular epithelial cells.

(45.) (a.) About 70%–80% of electrolytes and water are reabsorbed by PCT because it is lined by simple cuboidal brush border epithelium. It increases the surface area for reabsorption. PCT also helps to maintain the pH and ionic balance of the body fluids.

(46.) (b.) Collecting duct extends from the cortex of the kidney to the inner parts of the medulla. Large amount of water could be reabsorbed from this region to produce a concentrated urine. This segment allows passage of small amounts of urea into the medullary interstitium to keep up the osmolarity

(47.) (d.) The parts that play a significant role in the production of concentrated urine are Henle's loop and vasa recta. The flow of filtrate in the two limbs of Henle's loop is in opposite directions and thus forms a counter current. The flow of blood through the two limbs of vasa recta is also in a counter-current pattern.

(48.) (d.) An increasing osmolarity towards the inner medullary interstitium is maintained by the proximity between the Henle's loop and vasa recta and counter-current in them. The osmolarity increases from 300 m Osmol L^{-1} in the cortex to about 1200 m Osmol L^{-1} in the inner medulla.

(49.) (d.) The gradient from cortex to medulla is mainly caused by NaCl and urea. In the cortex, the osmolarity is 300 m Osmol L^{-1} and in medulla it becomes 1200 m Osmol L^{-1}.

(50.) (a.) The Osmolality in cortex of kidney is 300 m Osmol L^{-1} while in medulla it is 1200 m Osmol L^{-1}. The ascending limb of Henle's loop transports NaCl which is exchanged with the descending limb of vasa secta. Small amount of urea enters the thin segment of ascending limb of Henle's loop which is transportated back to the interstitium by the collecting tubule.