ENTRANCE TEST 2020
MDCAT
TEST # 1
BIOLOGY

Q.1 Elimination of nitrogenous wastes from the body is called:

A) Osmoregulation
B) Thermoregulation
C) Excretion
D) Homeostasis

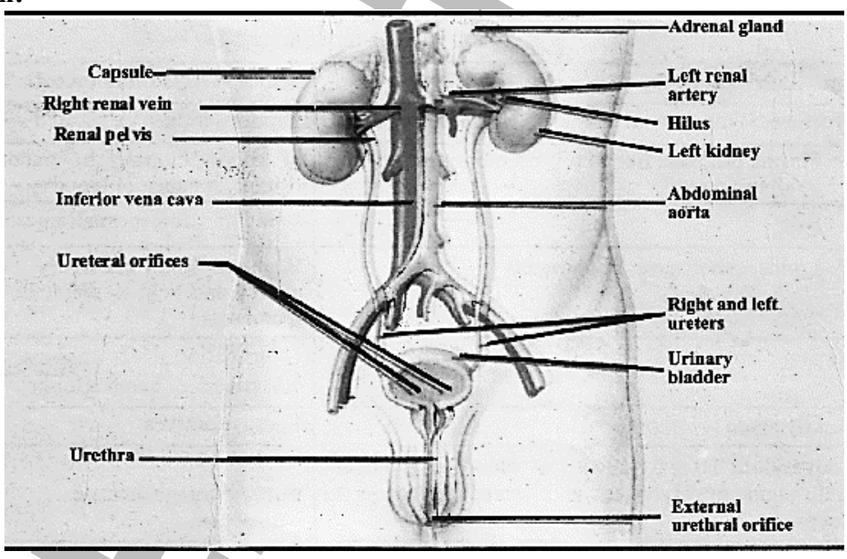
Explanation:

Osmoregulation	Regulation of the amount of solutes and water.
Thermoregulation	The maintenance of internal temperature within a tolerable range.
Excretion	Elimination of nitrogenous wastes.
Homeostasis	Maintenance of internal conditions in a cell or an organism by means of a self-regulation mechanism is called homeostasis.

Q.2 Blood containing nitrogenous wastes is received by kidneys through:

A) Artery
B) Vein
C) Arteriole
D) Venule

Explanation:



Renal artery	Supplies blood to kidney.
Renal vein	Drains blood from kidney.
Efferent arteriole	Exits blood from Bowman's capsule.
Afferent arteriole	Supplies blood to Bowman's capsule.

Q.3 Kidney is basically a/an:

A) Osmoregulatory organ
B) Excretory organ
C) Thermoregulatory organ
D) Glucoregulatory organ

Explanation:

Many waste substances are produced during metabolism in our body which are carried by the blood to the kidneys. Kidneys filter the blood to remove waste substances through urinary system. However, along with excretion kidney also plays a role in osmoregulation in secondary capacity.

Production of blood	Bone marrow
Filtration of blood	Kidney
Pumping of blood	Heart
Production of urea	Liver

Q.4 Glomerulus may better be described as a:

A) Knot of Capillaries
C) Ball of capillaries
B) Network of capillaries
D) Loop of capillaries

Explanation:

Vasa recta	In juxtamedullary nephrons additional blood capillaries extend down to form a loop of vessels. They lie parallel to the loop of Henle.
Peritubular capillaries	Network of capillaries around tubular part of nephron.
Glomerulus	Ball of blood capillaries receive blood from afferent arterioles and distributes blood to efferent arterioles. Blood is filtered here.
Collecting ducts	Terminal portion of the distal convulated tubules empties into collecting duct. The collecting duct opens into pelvis.

Q.5 In human female urination occurs through a tube, called:

A) Ureter
C) Urethra
B) Vagina
D) Nephron

Explanation:

Ureter	A duct through which urine leaves the kidney.
Urinary bladder	The urinary bladder is a muscular which sac receives urine from kidney through ureters.
Urethra	Urine leave the body during urination, from the urinary bladder through urethra.
Collecting duct	Terminal portion of the distal convulated tubules empties into collecting duct. The collecting duct opens into renal pelvis.

Q.6 The animals having advantage of being diversified and distributed in variety of regions on earth are:

A) Ectothermic
C) Endothermic
B) Heterothermic
D) Poikilothermic

Explanation:

Endothermic animals being capable to maintain their body temperature by producing heat from within the body can survive in variety of habitats.

Q.7 A loop of blood vessels which is part of juxtamedullary nephrons is called:

A) Vasa recta
C) Distal tubule
B) Loop of Henle
D) Proximal tubule

Explanation:

Vasa recta	In juxtamedullary nephrons additional blood capillaries extend down to form a loop of vessels.
Bowman's capsule	It is involved in formation of Bowman's filtrate with the help of glomerulus surrounded by it.
Collecting duct	Terminal portion of the distal convulated tubules empties into collecting duct. The collecting duct opens into renal pelvis.
Proximal tubule	It is involved in the reabsorption of useful constituents of glomerular filtrate.

Q.8 In each nephron inner end forms a cup-shaped swelling called:

A) Bowman's capsule
C) Renal pyramid
B) Renal hilus
D) Renal capsule

Explanation:

The end of nephron which revives the wastes from blood by glomerulus is called bowman's capsule. It is considered inner part of nephron, as the other end pours out the urine from nephron into renal pelvis.

Q.9 All the useful constituents of the glomerular filtrate are returned to the blood by a process called:

A) Active transport
C) Secretion
B) Reabsorption
D) Diffusion

Explanation:

All the useful constituents of the glomerular filtrate are reabsorbed in proximal tubules and when filtrate leaves proximal tubules, it mostly contains nitrogenous wastes.

Q.10 Which one of the following is not part of glomerular filtrate?

A) Urea
C) Salts
B) Globulin
D) Uric acid

Explanation:

Urea	Part of glomerular filtrate.
Globulin	Normally plasma proteins are not removed when the kidney filters wastes from the blood because their molecular weight, size, and porosity of the glomerulus.
Salts	Part of glomerular filtrate.
Uric acid	Part of glomerular filtrate.

Q.11 _____ nephrons are specifically instrumental in the production of concentrated urine:

A) Cortical
C) Proximal
B) Juxtamedullary
D) Distal

Explanation:

Cortical nephron	Juxtamedullary nephron
Renal corpuscle just beneath capsule.	Renal corpuscle deep in cortex.
Short loop of Henle.	Long loop of Henle.
Filtration	Filtration + Concentration of urine.

Q.12 Tubular part of juxtamedullary nephrons, loops deep into:

A) Outer cortex
C) Inner medulla
B) Inner cortex
D) Outer medulla

Explanation:

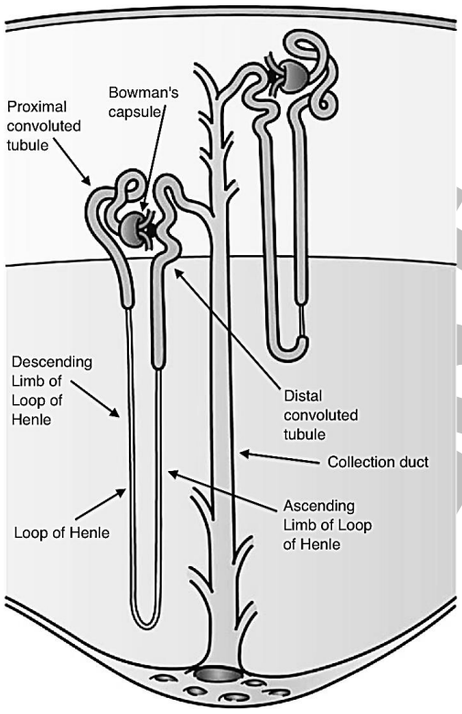
Those nephrons which are arranged along the border of cortex and medulla with their tubular system looping deep in inner medulla are juxtamedullary nephrons and they are specifically instrumental in concentration of urine.

Q.13 Reabsorption of all the useful constituents of glomerular filtrate normally takes place in:

A) Glomerulus
C) Bowman's capsule
B) Proximal tubule
D) Distal tubule

Explanation:

Glomerulus	It is involved in pressure filtration.
Proximal tubule	Reabsorption of all useful constituents of glomerular filtrate.
Bowman's capsule	It is involved in formation of Bowman's filtrate.
Distal tubule	It receives the filterate from ascending limb of loop of Henle.



Q.14 Which one of the following processes is mainly involved in maintaining pH of glomerular filtrate?

A) Pressure filtration
C) Tubular secretion
B) Reabsorption
D) Concentration of urine

Explanation:

The tubular epithelium also secretes substances into the lumen of nephron, this secretion is very selective and is mainly of hydrogen ions to balance pH value of the filtrate passing through the tubule.

Q.15 The collecting tubules open into:

A) Renal hilus
C) Renal medulla
B) Renal pelvis
D) Renal cortex

Explanation:

Bowman's capsule continues as extensively convoluted proximal tubule, loop of Henle and the distal tubule, which empties into collecting tubules which open into renal pelvis where urine is collected before it receives the kidney.

Q.16 Which one of the following does not allow outflow of water?

A) Ascending limb of loop of Henle
C) Proximal convoluted tubule
B) Descending limb of loop of Henle
D) Collecting tubule

Explanation:

The thin ascending limb is impermeable to water, but it is permeable to ions. In thick ascending limb of loop of Henle Sodium (Na+), potassium (K+) and chloride (Cl−) ions are reabsorbed from the urine by active transport.

Q.17 The active uptake of sodium in the thick limb of loop of Henle is promoted by the action of:

A) ADH
B) Aldosterone
C) Oxytocin
D) Insulin

Explanation:

The active uptake of sodium in the ascending limb of loop of Henle is promoted by the action of aldosterone, the hormone secreted from adrenal cortex.

Q.18 Under the influence of ADH, water is actively reabsorbed from:

A) Collecting tubule
B) Loop of Henle
C) Distal tubule
D) Proximal tubule

Explanation:

Contrary to the descending limb of loop of Henle, in urine collecting tubules water is actively reabsorbed under the influence of ADH.

Q.19 Urea leaves the human blood in the form of:

A) Urine
B) Tubular secretion
C) Glomerular filtrate
D) Sweat

Explanation:

Human blood is filtered while passing through the glomerulus into Bowman's capsule. Urea along with some useful substances leave the blood in the form of glomerulus filtrate.

Q.20 The production of concentrated urine indicates the:

A) Deficiency of water
B) Availability of water
C) Inactivity of body
D) Inactivity of sweat glands

Explanation:

In restricted supply of water, the conservation of water is the principal function of the body. However in the sufficient supply of water, reabsorption of water from the filtrate is reduced.

Q.21 Internal environment of organisms is stabilized through:

A) Excretion
B) Osmoregulation
C) Thermoregulation
D) Homeostasis

Explanation:

Excretion	Elimination of nitrogenous wastes.
Osmoregulation	Regulation of water and solutes.
Thermoregulation	Regulation of temperature.
Homeostasis	Maintenance of internal conditions in a cell or an organism by means of a self-regulation mechanism is called homeostasis.

Q.22 The stimulus for the secretion of ADH is:

A) Hypertonic condition in the body
B) Hypotonic condition in the body
C) Isotonic condition in the body
D) Hypoosmotic condition in the body

Explanation:

Antidiuretic hormone (ADH) also called vasopressin is a hormone produced by hypothalamus and stored in posterior pituitary. Whenever we are faced to restricted supply of water (hypertonic conditions) it is released from posterior pituitary and acts upon urine collecting duct to get the more and more water actively reabsorbed from filtrate back into blood stream.

Q.23 _____ **circulates the blood through Bowman's capsule:**

A) Peritubular capillaries
C) Glomerulus
B) Afferent arteriole
D) Efferent arteriole

Explanation:

In each nephron inner end forms a cup-shaped swelling, called **Bowman's capsule** and it is around a ball of capillaries called **glomerulus**. Glomerulus circulates blood through capsule as it arrives through **afferent arteriole** and leaves the capsule by **efferent arteriole**. The blood vessel subdivides again into another network of capillaries, the **peritubular capillaries**. Bowman capsule continues as extensively convoluted **proximal tubule**, **loop of Henle** and the **distal tubule**, which empties into **collecting tubules**. The collecting tubules open into pelvis. The filtrate from glomerulus passes through these structures and is processed ultimately for urine formation. The peritubular capillaries intermingle with proximal and distal tubules of the nephron. In juxtamedullary nephrons additional capillaries extend down to from a loop of vessels, **vasa recta**.

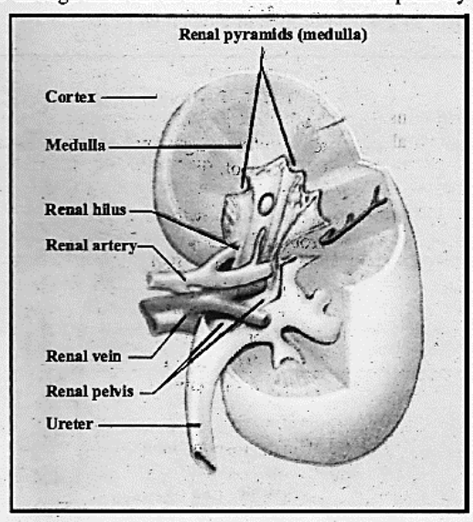


Fig. 15.11. The structure of a kidney

Q.24 **Reabsorption of glomerular filtrate starts from:**

A) Loop of Henle
C) Proximal convoluted tubule
B) Distal convoluted tubule
D) Urine collecting duct

Explanation:

Collecting tubule	Reabsorption of water under the action of ADH.
Ascending loop of Henle	Reabsorption of sodium under the action of aldosterone.
Bowman's capsule	It surrounds a ball of capillaries called glomerulus and receives the filtrate.
Proximal convulated tubule	Reabsorption of all useful constituents of glomerular filtrate.

Q.25 **Main factor for the production of hypertonic urine is gradually increasing osmotic concentration from:**

A) Inner medulla to cortex
C) Renal pelvis to ureters
B) Cortex to inner medulla
D) Ureters to urinary bladder

Explanation:

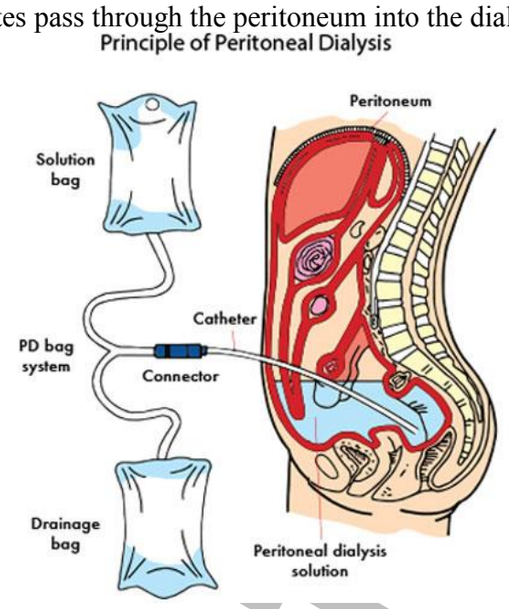
The interstitial fluid of the kidney is gradually concentrated from cortical to medullary part, thus inner medulla is highly concentrated with the presence of urea and through a mechanism of counter-current multiplier.

Q.26 In peritoneal dialysis, blood is filtered through thin:

A) Artificial membrane
B) Endothelium
C) Epithelium
D) Dialysis membrane

Explanation:

Peritoneal cavity is filled with dialysis fluid that enters the body through a catheter. Excess water and wastes pass through the peritoneum into the dialysis fluid.



Q.27 Incidence of calcium phosphate type kidney stones is_____% greater than that of uric acid type stones:

A) 05
B) 10
C) 15
D) 20

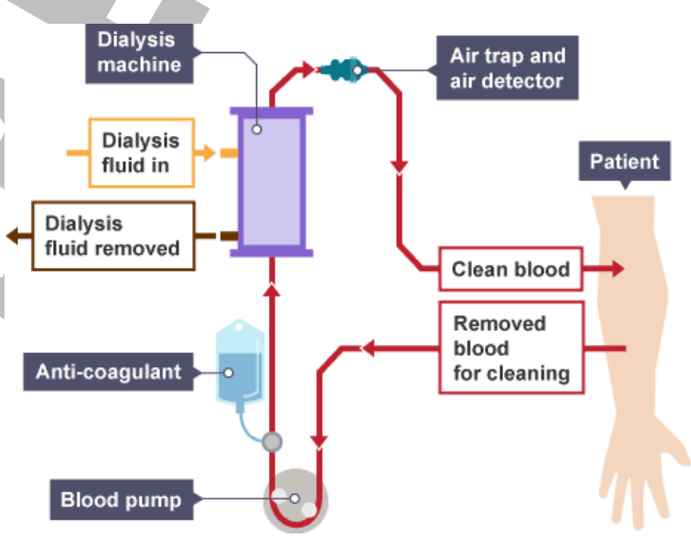
Explanation:

Type of stones	%age	Cause
Calcium oxalate	70%	Hypercalcemia
Calcium phosphate	15%	Hyperoxaluria
Uric acid	10%	Hyperuricemia

Q.28 Dialyzer is also called:

A) Kidney
B) Perpetual nephron machine
C) Artificial kidney
D) Homeostatic machine

Explanation:



Q.29 In renal failure or uremia the only option left is:

A) Kidney transplant
C) Chemotherapy
B) Dialysis
D) Excessive water intake

Explanation:

Dialysis may be used as a temporary measure. In high degree renal failure also called as uremia or end-stage renal disease, the dialysis cannot be done thus the surgical transplantation of a matching donor kidney is the only option left for as the permanent treatment.

Q.30 Which one of the following is a non-surgical removal of kidney stones?

A) Hemodialysis
C) Lithotripsy
B) Kidney transplant
D) Peritoneal dialysis

Explanation:

The kidney stones have been removed by kidney surgery. Presently lithotripsy is used for non-surgical removal of kidney stone. It is the technique used to break up stones that form in the kidney, ureter or gall bladder.

Q.31 In living control system response is shown by:

A) Receptors
C) Sensor
B) Effectors
D) Control center

Explanation:

Receptors	Detect changes in variable and feed that information back to the control center.
Effectors	In living control system response is shown by effectors.
Sensor	Receptor.
Control center	Integrate data from sensor and stored "set point" data.

Q.32 Which one of the following is not a part of nephron?

A) Urethra
C) Loop of Henle
B) Bowman's capsule
D) Proximal tubule

Explanation:

Urethra	In male mammals, excretory and reproductive systems share it. Urethra not a part of functional unit of kidney but a part of urinary system.
Bowman's capsule	Part of nephron.
Loop of Henle	Part of nephron.
Proximal tubule	Part of nephron.

Q.33 Reabsorption of glomerulus filtrate in human kidney can save _____ % of the water of the filtrate:

A) 99.5
C) 98
B) Over 99.5
D) Over 98.5

Explanation:

Mammalian kidney is able to regulate the excretion of water independently from that of solutes. It takes advantage of the diluting ability of the thick ascending limb to produce osmotic energy which is then used to concentrate solutes in the urine.

Q.34 Homeostasis is the maintenance of internal conditions in a cell or an organism by means of a:

A) Self-regulation mechanism
C) Acquired regulation mechanism
B) Voluntary regulation mechanism
D) Adopted regulation mechanism

Explanation:

Homeostasis	Maintenance of internal conditions in a cell or an organism by means of a self-regulation mechanism is called homeostasis.
Excretion	Elimination of nitrogenous wastes.
Osmoregulation	Regulation of water and solutes.
Thermoregulation	Regulation of temperature.

See glossary page # V

Q.35 Detection of change and signaling for effector's response to control system is a:

A) Feedback mechanism C) Negative feedback
B) Positive feedback D) Feedback inhibition

Explanation:

Feedback mechanism	Type of interaction in which a controlling mechanism is itself controlled by the product of reactions it is controlling.
Positive feedback	Self-amplifying cycle greater change in the same direction.
Negative feedback	Mechanism to reverse the change.
Feedback inhibition	When final product inhibits enzyme of step 1 in a serial chemical reaction of metabolism.

Q.36 A homeostatic control system just like a physical control system consists of:

A) Three components C) Four components
B) Two components D) Five components

Explanation:

The living control system works exactly on the mechanism of physical control system. It has three components: receptor, control centre and an effector.

Q.37 Persistent use of tomatoes and green vegetables may cause:

A) Hyperuricemia C) Hypercalcemia
B) Hyperoxaluria D) Hyperthermia

Explanation:

Oxalate are present in green vegetables and tomatoes therefore may be the source of hyperoxaluria.

Q.38 Gland present on the top of kidneys is:

A) Adenoid C) Thyroid
B) Adrenal D) Parathyroid

Explanation:

Pituitary	Pituitary gland is present just below the hypothalamus.
Adrenal	On the top of kidney.
Thyroid	Situated below the larynx.
Parathyroid	Present at posterior part of lateral lobe the thyroid.

Q.39 The maintenance of internal temperature within a tolerable range is termed as:

A) Osmoregulation C) Excretion
B) Thermoregulation D) Homeostasis

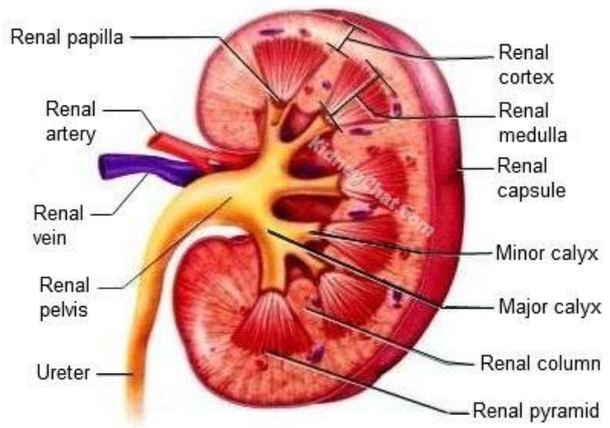
Explanation:

Osmoregulation	Regulation of solute and water.
Thermoregulation	The maintenance of internal temperature within a tolerable range.
Excretion	Elimination of nitrogenous waste.
Homeostasis	Maintenance of internal conditions in a cell or an organism by means of a self-regulation mechanism is called homeostasis.

Q.40 Which one of the following surrounds the kidney?

A) Renal capsule C) Pleura
B) Renal corpuscle D) Pericardium

Explanation:



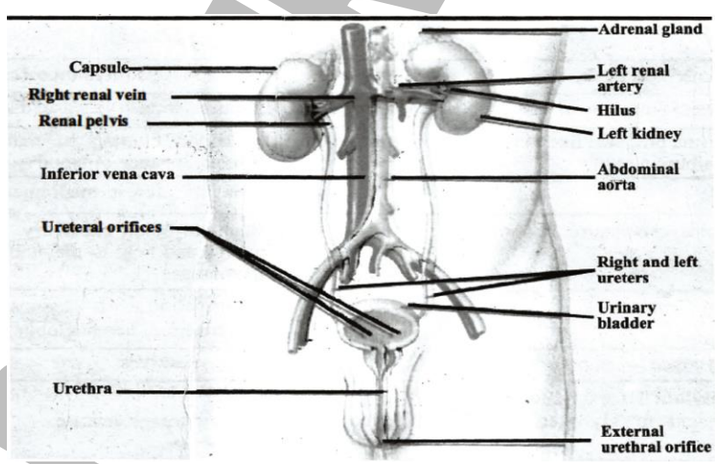
Capsule	The renal capsule is a tough fibrous layer surrounding the kidney and covered in a thick layer of perirenal fat. It provides some protection from trauma and damage.
Adrenal gland	Present in the top of kidney.
Pleura	Lungs are covered with double layered thin membrane.
Pericardium	Protects the heart, prevents it from over extension.

Q.41 The ureters of both kidneys pour urine into:

A) Urethra C) Hilus
B) Urinary bladder D) Pelvis

Explanation:

Two ureters carry urine from kidney to the urinary bladder, as shown in the figure below:



Q.42 Hyperoxaluria results in:

A) Oxalate type stones C) Uric acid type stones
B) Calcium type stones D) Gall stones

Explanation:

Hyperoxaluria	Causes oxalate type stones.
Hypercalcemia	Causes calcium type stone.
Hyperuricemia	Causes uric acid type stone.
Hypercholesterolemia	Causes gall stone.

Q.43 Which one of the following have enabled the animals and plants to distribute themselves in wide range of habitats?

A) Thermoregulation
C) Excretion
B) Osmoregulation
D) Reproduction

Explanation:

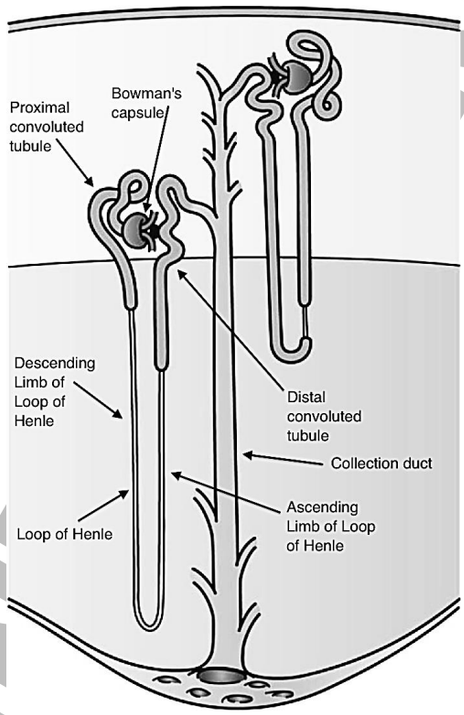
Osmoregulation	Regulation of solute and water.
Thermoregulation	The maintenance of internal temperature within a tolerable range.
Excretion	Elimination of nitrogenous waste.
Reproduction	Production of new offspring.

Q.44 The Bowman's capsules of nephrons are located in:

A) Medulla
C) Cortex
B) Hilus
D) Pelvis

Explanation:

Bowman's capsule (or the Bowman capsule) is a cup-like sac at the beginning of the tubular component of a nephron in the mammalian kidney. It is located in the cortex of kidney.



Q.45 Stones originating in urinary system, may be found in following parts, EXCEPT:

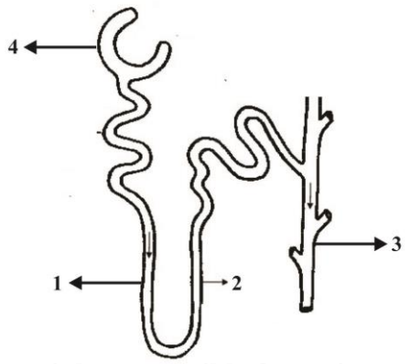
A) Gall bladder
C) Ureters
B) Kidneys
D) Urinary bladder

Explanation:

Kidney stones, or renal calculi are solid masses made of crystals. Kidney stones usually originate in your kidneys. However, they can develop anywhere along your urinary tract, which consists of these parts;

1. Kidneys
2. Ureters
3. Bladder
4. Urethra

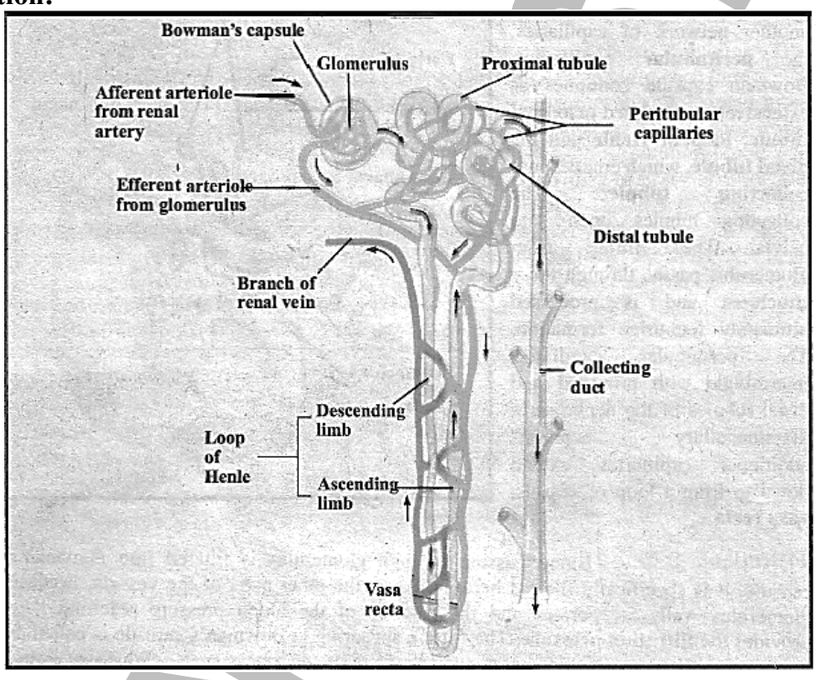
Q.46 The diagram shows a nephron:



Which labelled region is mainly responsible for active uptake of sodium?

A) 1
B) 2
C) 3
D) 4

Explanation:



Q.47 Homeostatic thermostat is present in which part of human brain?

A) Thalamus
B) Pons
C) Hypothalamus
D) Cerebellum

Explanation:

The body temperature regulation in humans is based on complex homeostatic systems facilitated by feedback mechanisms. The homeostatic thermostat is present in the hypothalamus, a brain part. It responds to the changes in the temperature above and below a set point which is 37°C.

Q.48 A network of blood capillaries that surrounds the renal tubules is called:

A) Efferent arterioles
B) Afferent arterioles
C) Peritubular capillaries
D) Glomerular capillaries

Explanation:

The efferent ateriole from glomerulus subdivides again into another network of capillaries, the peritubular capillaries.

Q.49 The part of nephron where pressure filtration occurs is called:

A) Distal portion of nephron
B) Urine collecting tubule
C) Glomerular capsule
D) Loop of Henle

Explanation:

See glossary Page # V.

Q.50 Birds and mammals have been provided the opportunity to keep high metabolic rate and availability of energy round the clock by the origin of:

A) Endothermy
C) Ectothermy
B) Heterothermy
D) Poikilothermy

Explanation:

Birds are endothermic i.e. they maintain their body temperature by producing heat from within the body. This they can upto optimum level which is inevitable to keep the high metabolic level.