ENTRANCE TEST 2020
MDCAT
TEST # 2
BIOLOGY

Q.1 The protection of internal environment from the harms of extreme temperature in external environment is called:

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

Explanation:

External environment and its components fluctuate continuously, however, the organism resists and manages these changes by making adjustments to keep its own internal fluctuations within narrow range thus protecting internal environment from the harms of the fluctuations in external environment.

Q.2 Pick up the one which fluctuates without protection:

A) Internal environment
C) Intracellular environment
B) External environment
D) Intercellular environment

Explanation:

There is no homeostatic control on external environment which fluctuates according to the variations in physical environmental factors, such as temperature, humidity, intensity of light etc. However the internal environment whether it is intercellular or intracellular is being protected by homeostatic protection.

Q.3 Shivering thermogenesis occurs when our body suffers from:

A) Net loss of water
C) Net loss of heat
B) Net gain of water
D) Net gain of heat

Explanation:

The rate of heat production is increased by increased muscle contraction by movement or shivering.

Q.4 Type of homeostasis that always involves loss of water is called:

A) Gluco-regulation
C) Thermoregulation
B) Osmoregulation
D) Excretion

Explanation:

Excretion never occurs without water, the lowest amount (1ml per 1gram) of water is used for excretion of uric acid. However for thermoregulation water is lost in the form of vapours whenever we suffer from hyperthermia. During hypothermia water is not lost. Similarly for osmoregulation water will be lost when we suffer from excess of water, otherwise it will be taken up.

Q.5 Homeostasis means keeping internal environment:

A) Absolutely constant
B) Relatively constant
C) Absolutely fixed
D) Massively fluctuating

Explanation:

As internal environment is being protected by homeostatic control system, it fluctuates in narrow or extremely narrow range as compared to wider external fluctuations.

Q.6 Urethra empties near the _____ in females or through the _____ in males:

A) Bladder, penis
B) Vagina, bladder
C) Vagina, penis
D) Urinogenital duct, penis

Explanation:

Human male uses urethra as urinogenital duct, however in human female urethra is used only for urination and it opens near vagina.

Q.7 In bacterial and viral infections mainly, _____ increase in number:

A) Erythrocytes
B) Leukocytes
C) Thrombocytes
D) Osteocytes

Explanation:

In bacterial and viral infections mainly, leukocytes increase in number.

Q.8 Homeostasis _____ in internal environment of an organism:

A) Lowers the temperature
B) Lowers the water potential
C) Lowers the solute potential
D) Lowers the fluctuation

Explanation:

External environment and its components fluctuate continuously, however, the organism resists and manages theses changes by making adjustments to keep its own internal fluctuations within a narrow range thus protecting internal environment from harms of the fluctuation.

Q.9 Adaptation to lower level of range in dry conditions and to higher level of range in abundant supply of water is called:

A) Homeostasis
B) Feedback mechanism
C) Osmoregulation
D) Excretion

Explanation:

As the water availability may fluctuate tremendously for the organism in external environment from abundant supply to almost dry conditions, however the quantity of water in the body i.e. internal environment may vary in response to abundant supply and dry conditions, but in a narrow range. The control system would not let the body flooded with water in abundant supply and also not to dehydrate in dry conditions.

Q.10 Part of brain associated with thermoregulation is called:

A) Thalamus
B) Hypothalamus
C) Limbic system
D) Hippocampus

Explanation:

The homeostatic thermostat is present in the hypothalamus, a part of forebrain part. It is part of limbic system of forebrain.

Q.11 Which one of the following have no link with excretion?

A) Urethra
C) Ureters
B) Vagina
D) Urinary bladder

Explanation:

Vagina is reproductive tract of human female. However, urethra expels urine from urinary bladders, ureters bring the urine from renal pelvis to the urinary bladder where it is stored temporarily.

Q.12 In mammals _____ have been adapted for thermoregulation:

A) Liver
C) Kidney
B) Urinary bladder
D) Skin

Explanation:

Skin contains sweat glands which produce evaporative cooling to bring the temperature down. However, in some animals a fat is also laid down beneath the skin to provide insulation.

Q.13 Vasodilation is a part of:

A) Excretory strategy
C) Thermoregulatory strategy
B) Homeostatic strategy
D) Osmoregulatory strategy

Explanation:

Whenever we face hyperthermia, the blood vessels providing blood to the skin are dilated to bring the maximum blood in skin and then sweat glands produce cooling by evaporative loss of water. Thus, temperature is brought down to normal range.

Q.14 Following are exclusively associated with excretion, EXCEPT:

A) Ureters
C) Urinary bladder
B) Urethra
D) Nephron

Explanation:

In human female urinary and genital roles are performed by two independent tubes i.e. Vagina acts as genital duct whereas urine is passed out through urethra which opens near vagina. However, in human male the genital role is also performed by urethra.

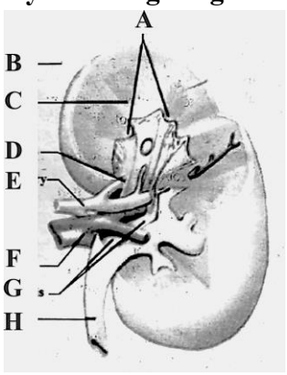
Q.15 Diuresis can be checked by the action of:

A) Aldosterone
C) Cortical nephron
B) ADH
D) Oxytocin

Explanation:

ADH or antidiuretic hormone also called vasopressin is a hormone produced by hypothalamus and stored in posterior pituitary. It is associated with conservation of water. It is released when the body is facing restricted supply of water. It acts upon urine collecting ducts ad get maximum water reabsorbed from filtrate back into blood stream.

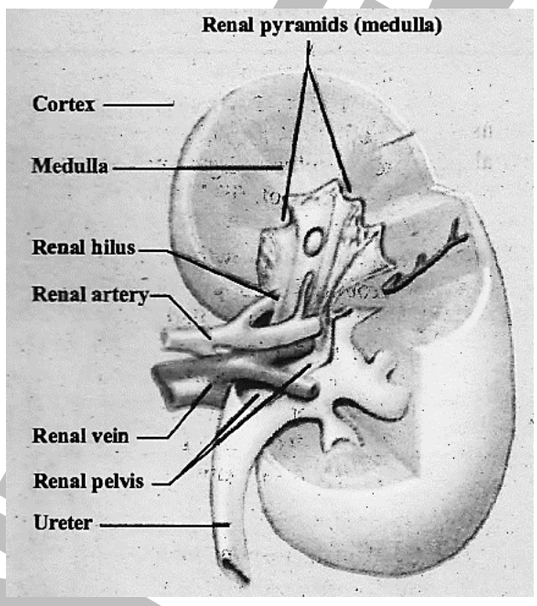
Q.16 Name the structure indicated by 'A' in figure given below:



A) Cortex
B) Medulla
C) Renal pyramid
D) Renal hilus

Explanation:

Renal pyramids, also known as malpighian pyramids, are located inside the inner kidney or medulla. They consist of tubules which collect urine from the outer kidney and transfer it into calyces.



Q.17 The route of urine excretion from kidney to outside of body is:

A) Kidney→ureter→urinary bladder→urethra
B) Urinary bladder→kidney→ureter→urethra
C) Kidney→urethra→urinary bladder→ureter
D) Kidney→ureter→urethra→urinary bladder

Explanation:

Blood passing through the glomerulus is filtered into Bowman's capsule. It is specially filtrate here. Unlike at the other parts of the vessels because glomerulus walls are porous and the fraction of the blood pressure reaching here provides the filtration pressure.

Q.18 Name the blood capillaries having arterioles at their both ends:

A) Systemic capillaries
B) Glomerular capillaries
C) Alveolar capillaries
D) Sinusoid capillaries

Explanation:

Unlike systemic capillaries, which receive blood from high resistance arterioles and drain to low resistance venules, glomerular capillaries are connected in both ends to high resistance

arterioles. Sinusoid capillaries are actually classified as a type of open pore capillary which are found in the liver, lymphoid tissue, endocrine organs and hempoitic organs

Q.19 Maximum reabsorption from glomerular filtrate occurs, while passing through:

A) Proximal tubule
C) Distal tubule
B) Descending loop of Henle
D) Ascending loop of Henle

Explanation:

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

Q.20 Counter current multiplier causes following things, EXCEPT:

A) Gradual osmotic outflow of water from filtrate back to kidney
B) Concentration of filtrate
C) Gradual increase in the osmotic concentration from cortex to inner medulla
D) Gradual increase in the osmotic concentration from medulla to outer cortex

Explanation:

Inner medulla is more concentrated than outer medulla, as the interstitial fluid of the kidney is gradually concentrated from cortical medullary part.

Q.21 The production of concentrated urine is an indication of:

A) Water constraint to the body
C) More frequent urination
B) Hypotonic body fluids
D) Over production of urine

Explanation:

Whenever we are deficient in water the conservation of water becomes major function of our body.

Q.22 Following are true about dialyzer, EXCEPT:

A) It is an artificial kidney
C) It uses dialysis fluid
B) It has two spaces separated by a thin membrane
D) It uses a living membrane

Explanation:

Living membrane (peritoneum) is used in peritoneal dialysis not in dialyzer which is a machine which uses an artificial membrane. The process is called hemodialysis.

Q.23 Stone phosphates are formed and trapped in the:

A) Cortical area
C) Pelvis area
B) Medullary area
D) Glomerular area

Explanation:

Stones of phosphates are formed and trapped in the pelvis area of kidneys.

Q.24 Funnel like proximal part of ureter is called:

A) Renal pyramid
C) Renal pelvis
B) Renal Hilus
D) Renal medulla

Explanation:

Renal pelvis or pelvis of kidney is a basin like or funnel like dilated proximal part of the ureter in the kidney. It is the point of convergence of two or three major calyces. Its major function is to act as funnel for urine flowing to the ureter

Q.25 The main nitrogenous excretory product of humans is:

A) Ammonia
B) Urea
C) Creatine
D) Uric acid

Explanation:

Humans are ureotelic animals.

Q.26 Following are true about urethra, EXCEPT:

A) It is used to expel urine in human male
B) It is used to expel urine in human female
C) It plays a genital role in human male
D) It plays a genital role in human female

Explanation:

In human male urethra plays a dual role i.e. urinary as well as genital role. However in human female urethra plays urinary role only, whereas vagina plays a genital role.

Q.27 Blood is drained from a kidney by:

A) Afferent arteriole
B) Efferent arteriole
C) Renal artery
D) Renal vein

Explanation:

Drainage of blood from kidney is the job of renal vein as supply of blood to a kidney is the job of renal artery. However drainage of blood from a nephron is the job of efferent arteriole and supply of blood to a nephron is the job of afferent arteriole.

Q.28 The entry and exit point of kidney is:

A) Renal hilus
B) Renal pelvis
C) Renal capsule
D) Renal pyramid

Explanation:

The concavity of kidney is called renal hilus. It is great way to kidney. All the supply lines of kidney enter and drainage lines of kidney exit here.

Q.29 Following substances are reabsorbed from glomerular filtrate in proximal tubule, EXCEPT:

A) Glucose
B) Amino acids
C) Urea
D) Water

Explanation:

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

Q.30 Production of large volume of urine indicates following, EXCEPT:

A) Oversecretion of ADH
B) Hypotonic body fluids
C) Undersecretion of ADH
D) Increased intake of water

Explanation:

Oversecretion of ADH will get the maximum water actively reabsorbed from collecting duct and as a result small volume of concentrated urine will be produced. Hypotonic body fluids, increased intake of water and undersecretion of ADH promote the volume of urine.

Q.31 Ureteral orifices allow the entry of urine from:

A) Ureters to urinary bladder
C) Urinary bladder to urethra
B) Urinary bladder to ureters
D) Urethra to urinary bladder

Explanation:

Ureter receives the urine from kidney and pour it down into urinary bladder through ureteral orifices.

Q.32 Which one of the following activity of kidney depends upon adrenal gland?

A) Retention of water
C) Urine formation
B) Retention of salts
D) Tubular secretion

Explanation:

Adrenal gland ensures the retention of sodium salts in our body by getting it reabsorbed from ascending limb of loop of Henle under the influence of Aldosterone hormone.

Q.33 Active uptake of water occurs in:

A) Descending limb of loop of Henle
C) Urine collecting duct
B) Ascending limb of loop of Henle
D) Proximal tubule

Explanation:

Active reabsorption of water occurs under the influence of ADH from urine collecting duct when there is restricted supply of water to the body.

Q.34 In lithotripsy the kidney stones are removed through:

A) Urine
C) Sweat
B) Faeces
D) Machine

Explanation:

In lithotripsy, high concentration of X-ray or ultrasound are directly from a machine outside the body to the stone inside. The shockwaves break the stone in tiny pieces or into sand, which are passed out of the body in urine.

Q.35 Minimum number of kidney stone patients suffer from:

A) Calcium oxalate type stones
C) Uric acid type stones
B) Calcium phosphate type stones
D) Cholesterol type stones

Explanation:

70% of all kidney stone patients suffer from oxalate type stones whereas 15% suffer from calcium phosphate type stones and 10% suffer from uric acid type stones. Hyperoxaluria is the cause of calcium oxalate type stones.

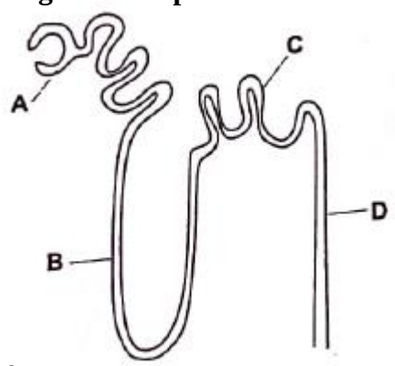
Q.36 The filtrate appearing in the Bowman's capsule normally lacks:

A) Amino acids
C) Urea
B) Glucose
D) Erythrocytes

Explanation:

Red blood cells (Erythrocytes) are normally not part of glomerular filtrate. However it may occur if person suffers from hematuria.

Q.37 Given below is the diagram of nephron without vascular supply.



What is the name of part C?

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

Explanation:

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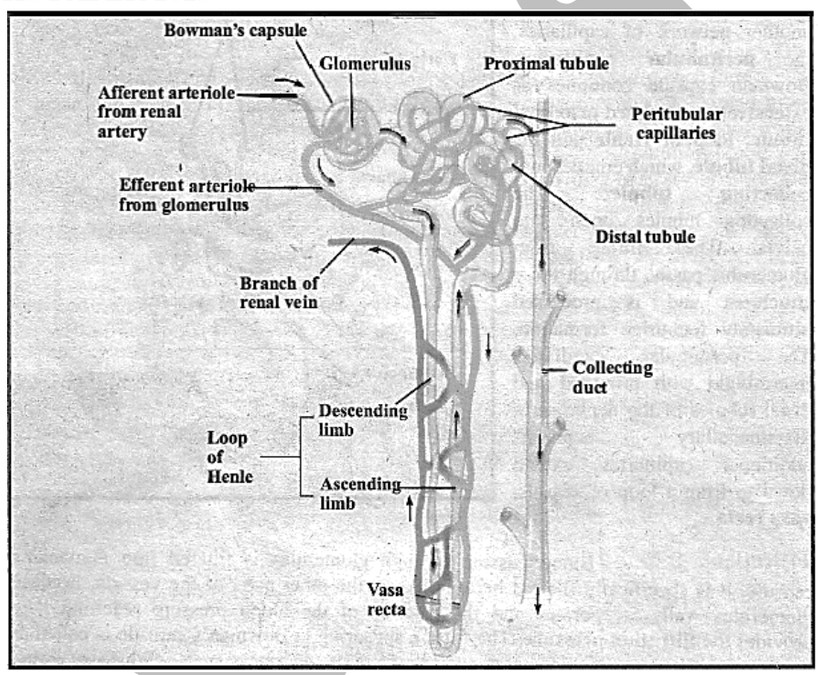


Q.38 Blood is supplied to peritubular capillaries from:

A) Afferent arteriole
B) Efferent arteriole
C) Vasa recta
D) Renal artery

Explanation:

In the renal system, peritubular capillaries are tiny blood vessels, supplied by efferent arteriole, that travel alongside the nephrons allowing reabsorption and secretion between blood and inner lumen of nephron. Peritubular capillaries surround the proximal and distal tubules, as well as the loop of Henle, where they are known as vasa recta.

Q.39 Peritubular capillaries and vasa recta are drained by:

A) Renal artery
B) Afferent arteriole
C) Renal vein
D) Efferent arteriole

Explanation:

In the blood supply of kidney, the straight arterioles of kidney (or vasa recta renis) are a series of straight capillaries in the renal medulla. They lie parallel to the loop of Henle. They hand over the filtered blood to renal veins.

Q.40 Kidneys get almost _____ % more blood than their due share on the basis of their percentage weight:

A) 20
B) 01
C) 19
D) 10

Explanation:

Weight of kidney accounts for less than 1% of the total body weight. Thus according to their proportionate weight they deserve less than 1% of the total blood volume. However, they got 20% of the blood supplied with each cardiac beat. Therefore, they get more than 19% additional blood than their proportionate volume.

Q.41 Kidney stones are formed in:

A) Kidneys
B) Ureters
C) Urinary bladder
D) Urinary bladder, ureter and kidneys

Explanation:

Kidney stones occur in kidney as ureter stone occurs in ureter and Gall stone occurs in gall bladder.

Q.42 Posterior pituitary is associated with conservation of water as:

A) It produces ADH
B) It produces oxytocin
C) It releases oxytocin
D) It releases ADH

Explanation:

ADH and oxytocin are products of hypothalamus but they are stored in posterior pituitary so they are released from posterior pituitary when needed. As oxytocin has no relation with conservation of water, thus answer is release of ADH.

Q.43 Kidney transplant is the only solution for:

A) Kidney stones
B) Hyperoxaluria
C) Uremia
D) Hypercalcemia

Explanation:

Completely failed kidneys cannot be revived, that is why the only solution is kidney transplant.

Q.44 Which one is incorrect about dialysis?

A) Carried out again and again
B) It is of two types
C) It is used as temporary measure
D) It requires matching donor

Explanation:

Immunosuppressant are given to a patient after kidney transplant not after dialysis.

Q.45 It is not associated with active uptake of a substance/s:

A) ADH
B) Aldosterone
C) Ascending limb of loop of Henle
D) Descending limb of loop of Henle

Explanation:

Counter current multiplier is associated with passive reabsorption of water from descending limb of loop of Henle. Aldosterone induces active uptake of Na^+ from ascending limb of loop of Henle and ADH induces active reabsorption of water from urine collecting tubule.

Q.46 Secretion of antidiuretic hormone is inversely proportional to the:

A) Volume of urine
B) Volume of sodium in urine
C) Concentration of urine
D) Concentration of urea in urine

Explanation:

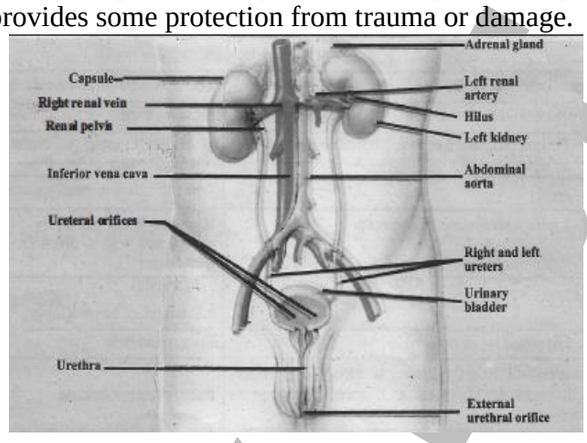
As the ADH is secreted, it get more and more water reabsorbed from filtrate by acting upon urine collecting duct and the volume of urine is decreased as a result of contrary to it volume of urine increases when ADH secretion decreases or stops. By more ADH secretion urine will become more concentrated and by low ADH secretion urine will be produced less concentrated.

Q.47 The outer layer of the kidney, where nephrons are located is called:

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

Explanation:

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 or damage.



Q.48 Extracorporeal shock waves are use in:

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

Explanation:

Presently lithotripsy is used for non-surgical removal of kidney stone. It is the technique used to breakup stones by extracorporeal shock waves.

Q.49 Circulating blood through a machine to get rid of nitrogenous wastes is called:

A) Peritoneal dialysis
C) Lithotripsy
B) Hemodialysis
D) Centrifugation

Explanation:

Hemodialysis means clearing the blood. It is carried out by dialyzer which is an artificial kidney.

Q.50 Uremia may result in following symptoms, EXCEPT:

A) Anemia
C) Low level of urea in blood
B) High level of urea in blood
D) Increase blood pressure

Explanation:

Uremia means high level of urea in blood.