BIOLOGY

Worksheet-1

STEP

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Worksheet-1
(Homeostasis)

Q.1 Animals cope with the temperature extremes by a homeostatic mechanism called:

A) Evaporative cooling

B) Shivering thermogenesis

C) Non-shivering thermogenesis

D) Thermoregulation

Q.2 Each organism of a species has assumed, in evolutionary history a specific set up of _____ at various levels of organization suitable to its surrounding.

A) Internal environment

B) External environment

C) Intracellular environment

D) Intercellular environment

Q.3 Weight of kidneys accounts for less than _____ % of the total body weight.

A) 10 C) 1

B) 20 D) 0.1

Q.4 Kidneys receive _____ % of blood supplied with each cardiac beat.

A) 1 C) 5

B) 10 D) 20

Q.5 Nephrons, in human kidneys are arranged along two distinct regions, i.e.:

A) An inner cortex and outer medulla

B) An outer cortex and an inner medulla

C) An inner cortex and an inner medulla

D) An outer cortex and a middle medulla

Q.6 The structure which is specifically instrumental in the production of concentrated urine is:

A) Cortical nephron

B) Juxtamedullary nephron

C) Counter current multiplier

D) Restricted supply of water

Q.7 The nephrons arranged along the cortex are called as:

A) Cortical

B) Juxtamedullary

C) Juxtacortical nephron

D) Medullary

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

A) Glomerulus

B) Bowman's capsule

C) Renal pyramid

D) Renal hilus

Q.9 In each nephron inner end forms a cup shaped swelling around a ball of capillaries called:

A) Bowman's capsule

B) Glomerulus

C) Loop of Henle

D) Renal pelvis

Q.10 It circulates blood through a capsule in a nephron:

A) Afferent arteriole

B) Peritubular capillaries

C) Efferent arteriole

D) Glomerulus

Q.11 Blood is specially filtered in glomerulus, because glomerular walls are porous, and the fraction of the _____ reaching here provides the filtration pressure.

A) Osmotic pressure

B) Blood pressure

C) Interstitial pressure

D) Diffusion pressure

Q.12 After coming out of the capsule as efferent arteriole, the blood vessel sub-divides again into another network of capillaries called:

A) Vasa recta

B) Afferent arteriole

C) Peritubular capillaries

D) Renal vein

Q.13 Bowman's capsule continues as:

A) Proximal tubule

B) Distal tubule

C) Loop of Henle

D) Urine collecting duct

Q.14 The collecting tubule receives wastes from:

A) Renal pelvis

B) Distal tubule

C) Proximal tubule

D) Loop of Henle

Q.15 Blood passing through _____ is filtered into Bowman's capsule.

A) Peritubular network

B) Glomerulus

C) Afferent arteriole

D) Efferent arteriole

Q.16 Blood is specially filtered in glomerulus, because glomerulus walls are porous and the fraction of the pressure reaching here provides the:

A) Osmotic pressure

B) Filtration pressure

C) Diffusion pressure

D) Osmotic pressure

Q.17 Glomerular filtrate contains numerous useful substances such as:

A) Glucose, amino acids, urea

B) Glucose, uric acid, salts

C) Glucose, amino acids, salts

D) Urea, uric acid, ammonia

Q.18 All useful constituents of the glomerular filtrate are reabsorbed in:

A) Distal tubule C) Proximal tubule

B) Loop of Henle D) Collecting tubule

Q.19 The tubular epithelium also secretes substances into the lumen, which is mainly of:

A) Hydrogen ions C) Potassium ions

B) Hydroxyl ions D) Sodium ions

Q.20 Conservation of water is the principal function of the body in:

A) Surplus supply of water

B) Restricted supply of water

C) Sufficient supply of water

D) Excess supply of water

Q.21 In restricted supply of water concentration of the filtrate is done by the following except:

A) Counter current

B) Hormonal mechanism

C) Antidiuretic Hormone

D) Aldosterone

Q.22 In sufficient or excess supply of water, reabsorption of water from filtrate is:

A) Increased C) Reduced

B) Maintained D) Stopped

Q.23 Reabsorption of water from filtrate is reduced in:

A) Surplus supply of water

B) Sufficient supply of water

C) Excess supply of water

D) Restricted supply of water

Q.24 Mammalian kidney including human is adapted to conserve water by _____ reabsorption of glomerular filtrate.

A) 99.0% C) 99.5%

B) 99.1% D) Over 99.5%

Q.25 The _____ of the kidney are gradually concentrated from cortical to medullary part of kidney.

A) Interstitial fluid

B) Glomerular filtrate

C) Blood

D) Interstitial fluid as well as filtrate

Q.26 Counter current multiplier causes gradual osmotic outflow of water from the filtrate back to kidney as it passes downward in the:

A) Proximal tubule

B) Collecting tubule

C) Descending loop of Henle

D) Distal tubule

Q.27 Ascending limb of loop of Henle does not allow _____ from its filtrate.

A) Outflow of sodium

B) Outflow of water

C) Outflow of salts

D) Outflow of any material

Q.28 Ascending loop of Henle actively transport _____ into kidney interstitium to sustain its high concentration.

A) Water C) Urea

B) Na^+ ions D) H^+ ions

Q.29 Various factors of pathological and chemical nature may progressively destroy the nephron which results in:

A) Increase in the plasma level of urea

B) Decrease in other nitrogenous wastes

C) Decrease in the plasma level of urea

D) Decrease in the blood pressure

Q.30 The function of the kidney is completely lost and it is unable to remove nitrogenous wastes, in:

A) Acute renal failure

B) Chronic renal failure

C) Partial renal failure

D) Kidney stones

Q.31 In case of uremia, to remove nitrogenous wastes, particularly the urea, the blood of the patient is treated through:

A) Centrifugation C) Transfusion

B) Lithotripsy D) Dialysis

Q.32 There are two types of dialysis i.e.:

A) Blood dialysis and peritoneal dialysis

B) Plasma dialysis and peritoneal dialysis

C) Hemodialysis and peritoneal dialysis

D) Hemodialysis and permanent dialysis

Q.33 Hemodialysis means:

A) Cleaning the blood

B) Replacing the blood

C) Washing the blood

D) Centrifugation of the blood

Q.34 The wastes and excess water pass during dialysis from blood through the membrane:

A) Into the body

B) Out of the body

C) Into the dialysis fluid

D) Out of the dialysis fluid

Q.35 Peritoneal cavity is filled with dialysis fluid that enters the body through a/an:

A) Artery C) Capillary

B) Vein D) Catheter

Q.36 It is the kidney machine that works on the same principle as the kidney for removal of wastes and excess water from the blood:

A) Catheter C) Dialyzer

B) Peritoneum D) Epithelium

Q.37 The surgical transplantation of a matching donor's kidney is the only option left for the permanent treatment of:

A) Kidney stones C) Uremia

B) Hypercalcemia D) Hyperoxaluria

Q.38 Homeostasis is the central requirement in the maintenance of an organism, which compels the _____ in constant changing conditions and contribute in evolutionary process.

A) Thermoregulation C) Excretion

B) Osmoregulation D) Adaptations

Q.39 Pick up the matching one:

A) Conservation of water-concentration of filtrate

B) Conservation of water-diluted urine

C) Restricted supply of water-diluted urine

D) Sufficient supply of water-concentration of filtrate

Q.40 Pick up the incorrect one:

A) Conservation of water results in concentration of filtrate

B) Restricted supply of water cause conservation of water

C) Release of ADH is inhibited in the presence of hypo-osmotic body fluids

D) Reduction in reabsorption results in production of small volume of conc. urine

Q.41 It is adapted to conserve water by over 99.5% reabsorption of glomerular filtrate:

A) Mammalian body including human

B) Mammalian kidney including human

C) Mammalian skin including human

D) Mammalian liver including human

Q.42 The active uptake of sodium from the ascending limb or thick loop of Henle is promoted by the action of:

A) ADH

B) Aldosterone

C) Concentration of filtrate

D) Vasopressin

Q.43 The production of varied concentration of urine depends upon the:

A) Availability of water

B) Availability of sodium

C) Production of aldosterone

D) Counter current multiplier

Q.44 Kidney stones are formed in:

A) Infectious diseases

B) Metabolic diseases

C) Genetic disease

D) Congenital diseases

Q.45 Calcium oxalate type stone is caused by:

A) Hyperoxaluria C) Hyperuricemia

B) Hypercalcaemia D) Metabolic disease

Q.46 The kidney stones caused by hypercalcaemia are _____ percent of the total kidney stones.

A) 10% C) 70%

B) 15% D) 5%

Q.47 The kidney stones caused by hyperoxaluria are _____ percent of the all kidney stones.

A) 10% C) 70%

B) 15% D) 5%

Q.48 The kidney stones caused by hyperuricemia are _____ percent of the all kidney stones.

A) 10% C) 70%

B) 15% D) 5%

Q.49 Hypercalcaemia i.e. high level of circulating calcium in blood is because of:

A) Stone of calcium phosphate

B) Stone of calcium oxalate

C) Stone of uric acid

D) Other diseases

Q.50 The salts are precipitated out during ____ and accumulate later to form stone.

A) Urea formation C) Urine formation

B) Urination D) Defecation

Q.51 Lithotripsy is a technique used to break up stones formed in the:

A) Kidney

B) Gall bladder

C) Ureter

D) Kidney, Ureter and gall bladder

Q.52 Extracorporeal, shock wave lithotripsy is:

A) The only way to carry out lithotripsy

B) One of the several ways to carry out lithotripsy

C) The most common way to carry out lithotripsy

D) A way likely to be used in future

Q.53 Various factors of pathological and chemical nature may progressively destroy the nephron, particularly its:

A) Glomerulus part

B) Convoluted tubule

C) Loop of Henle

D) Bowman's capsule

Q.54 A pair of Kidneys consists of _____of functional units.

A) Million C) Millions

B) Billion D) Billions

Q.55 Detection of change and signalling for effector's response to control system is a:

A) Homeostasis

B) Thermoregulation

C) Excretion

D) Feedback mechanism

Q.56 Animals maintain their internal osmotic state through:

A) Homeostasis C) Osmoregulation

B) Thermoregulation D) Excretion

Q.57 A specified set up of internal environment at various levels of organization suitable to its surroundings, have been assumed by each organism of a species in:

A) Life history

B) Life cycle

C) Evolutionary history

D) Homeostatic history

ANSWER KEY (Worksheet-1)							
1	D	18	C	35	D	52	B
2	A	19	A	36	C	53	A
3	C	20	B	37	C	54	C
4	D	21	D	38	D	55	D
5	B	22	C	39	A	56	C
6	B	23	C	40	D	57	C
7	A	24	D	41	B	58	
8	B	25	D	42	B	59	
9	B	26	C	43	A	60	
10	D	27	B	44	B	61	
11	B	28	B	45	A	62	
12	C	29	A	46	B	63	
13	A	30	B	47	C	64	
14	B	31	D	48	A	65	
15	B	32	C	49	D		
16	B	33	A	50	C		
17	C	34	C	51	D		

EXPLANATION

Q.1 Answer is "Thermoregulation"

Explanation: The process mentioned in 'A', 'B' and 'C' are partially supportive in temperature maintenance, however thermoregulation is the homeostatic process used in this regard.

Q.2 Answer is "Internal environment"

Explanation: Homeostatic arrangements in each organism have acquired perfection through evolution and now each species have its own arrangement.

Q.3 Answer is "01"

Explanation: Kidneys contribute less than 1% of the total body weight but they receive 20% of the total blood of the body by each cardiac beat. This indicates their physiological importance.

Q.4 Answer is "20"

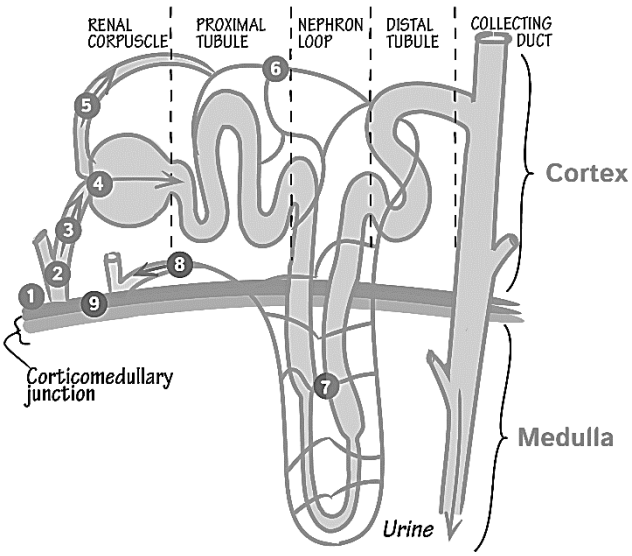
Explanation: Kidney contribute less than 1% of the total body weight but they receive 20% of the total blood of the body by each cardiac beat. This indicates their physiological importance.

Q.5 Answer is "An outer cortex and an inner medulla"

Explanation: Cortex literally means outer layer and medulla literally means inner part. The outer and peripheral part is called renal cortex and inner or central part is called renal medulla.

Q.6 Answer is "Juxtamedullary nephron"

Explanation: Though counter current multiplier and restricted supply of water are also associated with production of concentrated urine but they are not structures.



Q.7 Answer is "Cortical"

Explanation: Cortex is the outer and peripheral part of kidneys whereas medulla is the inner or central part of kidney. The nephrons of cortisol part are called cortical nephrons.

Q.8 Answer is "Bowman's capsule"

Explanation: Bowman's capsule or the Bowman capsule or capsule glomeruli or glomerular capsule is a cup like sac at the beginning of the tubular component of a nephron in the mammalian kidneys.

Q.9 Answer is "Glomerulus"

Explanation: The ball of capillaries is called glomerulus which is surrounded by a cup shaped structure called Bowman's

capsule. Glomerulus circulates the blood in the cup shaped Bowman's capsule.

Q.10 Answer is "Glomerulus"

Explanation: The ball of capillaries is called glomerulus which is surrounded by a cup shaped structure called Bowman's capsule.

Q.11 Answer is "Blood pressure"

Explanation: The net filtration pressure (NFP) at the glomerulus is the difference between the net hydrostatic pressure and the blood colloid osmotic pressure acting across the glomerular capillaries. This is the average pressure forcing water and dissolved materials out of the glomerular capillaries into the capsular space.

Q.12 Answer is "Peritubular capillaries"

Explanation: Peritubular capillaries constitute a network of tiny blood vessels that travel alongside nephrons, allowing reabsorption and secretion between blood and the inner lumen of the nephron. Peritubular capillaries surround the proximal and distal tubules, as well as the loop of Henle where they are known ass Vasa recta.

Q.13 Answer is "Proximal tubules"

Explanation: Proximal tubule receive filtrate from Bowman's capsule.

Q.14 Answer is "Distal tubules"

Explanation: Distal tube opens into collecting tubule.

Q.15 Answer is "Glomerulus"

Explanation: Glomerular membrane is used as initial filtering membrane.

Q.16 Answer is "Filtration pressure"

Explanation: Blood pressure provides the pressure required for pressure filtration.

Q.17 Answer is "Glucose, amino acids, salts"

Explanation: These useful substances are filtered out in aqueous solution along with waste substances from glomerulus into the Bowman's capsule.

Q.18 Answer is "Proximal tubule"

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

Q.19 Answer is "Hydrogen ions"

Explanation: Hydrogen ions make pH acidic to give the urine an antiseptic effect.

Q.20 Answer is "Restricted supply of water"

Explanation: When supply of water to the body is restricted the water inside the body is conserved to compensate it and vice versa. Thus volume of the urine is reduced and it becomes concentrated.

Q.21 Answer is "Aldosterone"

Explanation: Aldosterone is associated with active reabsorption of salts not of water. Whereas, rest of the choices are associated with concentration of urine and conservation of water.

Q.22 Answer is "Reduced"

Explanation: When sufficient or excess supply of water is available to our body, reabsorption from the glomerular filtrate will be reduced and more and more water will be allowed to leave the body in the form of urine.

Q.23 Answer is "Excess supply of water"

Explanation: When supply of water to the body is restricted the water inside the body is conserved to compensate it and vice versa.

Q.24 Answer is "Over 99.5%"

Explanation: More than 99.5% water from filtrate is reabsorbed in human and mammalian kidney.

Q.25 Answer is "Interstitial fluid as well as filtrate"

Explanation: The interstitial fluid of kidney becomes more and more

concentrated form cortex to inner medulla which exerts osmotic pressure on the filtrate moving inside the nephron thus making it more and more concentrated as well.

Q.26 Answer is "Descending loop of Henle"

Explanation: Water is passively reabsorbed from the filtrate back into blood stream while passing through the descending limb of loop of Henle.

Q.27 Answer is "Outflow of water"

Explanation: Sodium is actively reabsorbed from filtrate under the influence of aldosterone hormone while passing through the ascending limb of loop of Henle, not water.

Q.28 Answer is "Na^+ ions"

Explanation: Sodium is actively reabsorbed from filtrate under the influence of aldosterone hormone while passing through the ascending limb of loop of Henle.

Q.29 Answer is "Increase in the plasma level of urea"

Explanation: When nephrons suffers from any disorder, they remain unable to filter the urea from blood and as a result of plasma level of urea increases.

Q.30 Answer is "Chronic renal failure"

Explanation: In chronic renal failure the kidneys will not remove the nitrogenous wastes from the blood.

Q.31 Answer is "Dialysis"

Explanation: Dialysis is a temporary measure to clean the blood off nitrogenous wastes until the kidney transplant is managed.

Q.32 Answer is "Hemodialysis and peritoneal dialysis"

Explanation: Hemodialysis is a pure mechanical dialysis whereas in peritoneal dialysis a human membrane called peritoneum is used as filtering membrane to isolate the nitrogenous wastes from blood.

Q.33 Answer is "Cleaning the blood"

Explanation: Hemodialysis literally means cleaning the blood.

Q.34 Answer is "Into the dialysis fluid"

Explanation: Wastes are collected in dialysis fluid during dialysis.

Q.35 Answer is "Catheter"

Explanation: A catheter is a thin tube made from medical grade materials, serving a broad range of functions along with filling and draining the dialysis fluid from peritoneal cavity.

Q.36 Answer is "Dialyzer"

Explanation: As the name indicates, it is a dialysis machine.

Q.37 Answer is "Uremia"

Explanation: Uremia is an end stage kidney failure and it can be treated with kidney transplant only.

Q.38 Answer is "Adaptations"

Explanation: Adaptations gradually accumulate and become a result of evolution in longtime.

Q.39 Answer is "Conservation of water – concentration of filtrate"

Explanation: When water is taken back from the filtrate it becomes concentrated.

Q.40 Answer is "Reduction in reabsorption results in production of small volume of conc. urine"

Explanation: When reabsorption from filtrate is reduced it results in production of massive volume of diluted urine.

Q.41 Answer is "Mammalian kidney including humans"

Explanation: More than 99.5% water from filtrate is reabsorbed in human and mammalian kidney.

Q.42 Answer is "Aldosterone"

Explanation: Aldosterone hormone is secreted from adrenal cortex and acts upon ascending limb of loop of Henle to promote reabsorption of sodium by active uptake. It is mineralocorticoid hormone.

Q.43 Answer is "Availability of water"

Explanation: When sufficient water is available diluted urine is produced and when water is deficient urine is concentrated.

Q.44 Answer is "Metabolic diseases"

Explanation: Metabolic diseases result in formation of kidney stones.

Q.45 Answer is "Hyperoxaluria"

Explanation: It is high level of oxalates in blood which cause calcium oxalate type stones.

Q.46 Answer is "15%"

Explanation: As per statistical data given in textbook.

Q.47 Answer is "70%"

Explanation: As per statistical data given in textbook.

Q.48 Answer is "10%"

Explanation: As per statistical data given in textbook.

Q.49 Answer is "Other diseases"

Explanation: Hypercalcemia is caused by some metabolic, dietary or hormonal disorder.

Q.50 Answer is "Urine formation"

Explanation: Stone formation occur during urine formation.

Q.51 Answer is "Kidney, ureter and gall bladder"

Explanation: Stones formed in kidney, ureter and gall bladder can be broken down by radiations.

Q.52 Answer is "One of the several ways to carry out lithotripsy"

Explanation: Others are intracorporeal shockwave lithotripsy, laser lithotripsy electrohydraulic lithotripsy, mechanical lithotripsy and ultrasonic lithotripsy.

Q.53 Answer is "Glomerulus part"

Explanation: As glomerulus plays a vital role in filtration of wastes (particularly nitrogenous wastes).

Q.54 Answer is "Millions"

Explanation: Means many millions.

Q.55 Answer is "Feedback mechanism"

Explanation: In these processes there is an inverse effector's response to control the change.

Q.56 Answer is "Osmoregulation"

Explanation: Maintenance of inner osmotic state is the basic responsibility of osmoregulatory homeostasis, however excretory homeostasis also plays a role in it as a secondary function.

Q.57 Answer is "Evolutionary history"

Explanation: Homeostasis is the central requirement in the maintenance of an organism, which compels the adaptations in the constant changing conditions and contribute in evolutionary process. Thus homeostatic arrangements have been evolved along with the evolution of animal world. Highly evolved animals like mammals (including humans) have perfectly evolved homeostasis. Evolution of excretory homeostasis in animal world proceeded in following sequence.

Protonepheridial system → metanepheridrial system → true nepheridial system.

STEP

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