

QB365

Important Questions - Excretory Products and Their Elimination

11th Standard CBSE

Biology

Reg.No. :

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Time : 01:00:00 Hrs

Total Marks : 50

Section-A

- 1) What is meant by the term osmoregulation? 1
- 2) What are the excretory antennary glands are found as an excretory organ? 1
- 3) Define Glomerular Filtration rate (GFR). 1
- 4) What are the two substances responsible for causing the gradient for increasing hyperosmolarity of medullary interstitium? 1
- 5) What is the pH of urine? 1
- 6) Micturition is carried out by a reflex.Consider the statement True or False 1
- 7) how do lungs help in excretion? 1
- 8) What is the ratio of the concentrated filtrate to that of the initial filtrate? 1
- 9) In which part of the excretory system of mammals you can first use the term urine? 1
- 10) Write the mode of excretion performed by Xenopus. 1

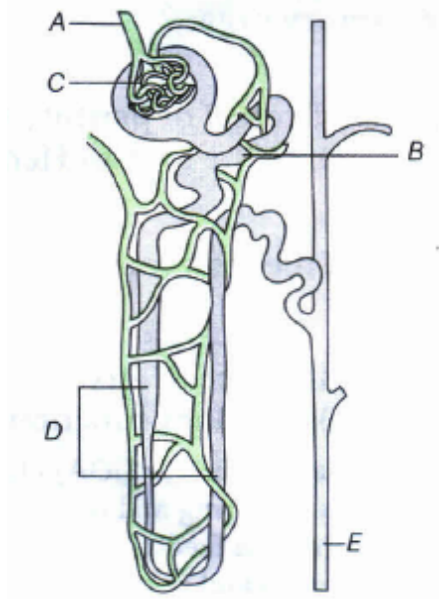
Section-B

- 11) What is the composition of sweat produced by sweat gland? 2
- 12) What differenced is observed in the ascending and the descending limbs of Henle's loop regarding permeability to H₂O? 2
- 13) Describe the role of alcohol and caffeine in the concentration of urine. 2
- 14) Discuss the regulation of kidney function by the heart. 2
- 15) State the importance of counter current systems in renal functioning. 2
- 16) What will happen if the stretch receptors of the urinary bladder wall are totally removed?Explain. 2
- 17) How is urea formed in the animal body? 2
- 18) What is ureotelism? Describe the process of formation of urea. 2
- 19) Where does the urine formation take place? 2
Name the processes involved in the formation of urine.
- 20) How is glomerular filtrate hypertonic and hypotonic in descending and ascending limb of loop of Henle,respectively.What is the effect of ADH on collecting tubules. 2

Section-C

- 21) Give full form of ANF.Name the organ that secretes it.Under what condition of the body is it released?What is its role in regulating kidney function? 5

- 22) Write a brief note on atrial natriuretic factor. 5
- 23) The glomerular filtrate in the loop of Henle gets concentrated in the descending and then gets diluted in the ascending limbs. Explain 5
- 24) (i) Study the given structure carefully and label the parts given as A, B, C, D and E. 5
- (ii) Give one major function of each of these.



Section-A

- 1) 1
 it is the phenomenon of regulation of change in the concentration of body fluids according to the concentration of external environment. In most marine invertebrates, some freshwater invertebrates, hagfish, etc., it can be clearly seen but it is found in all animals.
- 2) Uric acid 1
- 3) 1
 Glomerular Filtration Rate (GFR) is the amount of the filtrate formed by the kidneys per minute. GFR in a healthy individual is approximately 125ml/min ie, 180 L day
- 4) NaCl and urea 1
- 5) It ranges from 4.5-8.2, average pH is 6.0 1
- 6) True 1
- 7) Carbon dioxide and water are the waste products removed by the lungs in the expired air 1
- 8) The concentrated urine (filtrate) is nearly four times concentrated than the initial filtrate formed. 1
- 9) Collecting duct. 1
- 10) Dual excretion (mainly ammonotelism and partly ureotelism). 1

Section-B

- 11) 2
The sweat is released by sweat glands present in skin. It contains certain ions, little urea and lactic acid. It is acidic in nature.
- 12) The descending limb is permeable to water, while ascending limb is impermeable to water. 2
- 13) 2
Alcohol inhibits the release of ADH and caffeine interferes with ADH action and sodium reabsorption. Thus both of these artificially dilute the urine. Such compounds which dilute urine are called diuretic substances.
- 14) 2
Atrial Natriuretic Factor (ANF) is secreted by the atria of heart. It causes vasodilation (dilation of blood vessels) and thereby, decrease the blood pressure. ANF works antagonistically to RAAS
- 15) 2
Counter current mechanism has been evolved in higher vertebrates (birds and mammals including man) to excrete hypertonic urine (urine is more concentrated than blood) for conserving body water so necessary for land life.
- 16) 2
As urine collects in the urinary bladder, the muscular walls of the bladder distend to accommodate it. The stretch receptors on the wall of the bladder send signals to the CNS by stimulating the sensory nerve ending in the bladder. It causes an urge to pass out the urine. So if the stretch receptors are totally removed from the bladder, urine will not be collected in the bladder and urination will keep continuing.
- 17) Urea is formed by ornithin cycle. It occurs in liver. 2
- 18) 2
The process of excreting urea is called ureotelism.
Animals, which do not live in a high abundance of water convert toxic ammonia product in the body into the blood. This, in turn, is filtered and excreted out by the kidneys.
- 19) The process of urine formation is called uropoiesis. 2
Urine formation occurs in the Kidneys. It involves three steps.
i) Glomerular filtration
ii) Selective reabsorption
iii) Tubular secretion
- 20) 2
Counter current system is found in two limbs of loop of Henle. The ascending limb transports Na^+ and some urea into surrounding medullary tissue. It is impermeable to water. So, it makes urine diluted or hypotonic. The walls of descending limbs are permeable to water and salt, so Na^+ and water from surrounding fluid are absorbed. So the content of urine becomes hypertonic.
ADH (Antidiuretic Hormone) is secreted when the osmotic pressure of blood increases due to excess loss of water and body. The hormone renders the walls of distal convoluted tubule, Collecting Tubule (CT) and collecting duct of a nephron permeable to water and increases the reabsorption of water into the surrounding tissues and particular capillaries. The urine becomes hyperosmotic and less in volume and water is conserved in the body.

Section-C

21)

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ANF is commonly known as Atrial Natriuretic Factor.

ANF is a hormone produced by the walls of the atria of the heart in response to an increase in blood volume and pressure. It increases sodium excretion and decreases blood pressure.

ANF inhibits release of renin from **Juxta Glomerular Apparatus**(JGA) and thereby, inhibits NaCl reabsorption by the collecting duct and reduces aldosterone release from the adrenal gland.

Function The function of counter current mechanism is to concentrate NaCl in the interstitial fluid and thereby cause water to diffuse out of the collecting tubules and ducts and concentrate the urine.

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23)

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The gradient of increasing hyperosmolarity of medullary interstitium is maintained by a counter current mechanism and the proximity between the Henle's loop and vasa recta.

This gradient is mainly caused by NaCl and urea. The transport of these substances facilitated by the special arrangement of Henle's loop and vasa recta is called the counter current mechanism.

NaCl is transported by the ascending limb of Henle's loop, which is exchanged with the descending limb of vasa recta. NaCl is returned to the medullary interstitium by the ascending part of the vasa recta.

But, contrarily, the water diffuses into the blood of ascending limb of vasa recta and is carried away into the general blood circulation.

Permeability to urea is found only in the deeper parts of thin ascending limbs of Henle's loops and collecting ducts. Urea diffuses out of the collecting ducts and enters into the thin.

24) (i) A-Afferent arteriole,

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B-Proximal convoluted tubule,

C-Glomerulus,

D-Loop of Henle,

E-Collecting duct

(ii) Following are the functions of each above mentioned part

A-Carry blood to glomerulus for ultrafiltration.

B-Selective reabsorption of useful substances.

C-Ultrafiltration of blood.

D-Maintenance of the high osmolarity of medullary interstitial fluid.

E-Reabsorption of water to form hypertonic urine.