A-LEVEL

Multiple-choice questions on the excretory system and the kidney.

1. What is the primary function of the excretory system?

A) Digestion
B) Filtration
C) Reproduction
D) Respiration

Answer: B
Explanation: The excretory system primarily involves the filtration and elimination of waste products from the body.

2. Which of the following is not a function of the kidney?

A) Blood pressure regulation
B) Red blood cell production
C) Acid-base balance
D) Glucose regulation

Answer: D
Explanation: While the kidneys play a role in glucose regulation, it is not their primary function. The primary functions include filtration, blood pressure regulation, acid-base balance, and erythropoiesis (red blood cell production).

3. Where does filtration of blood occur in the kidney?

A) Renal pelvis
B) Renal tubules
C) Glomerulus
D) Bowman's capsule

Answer: D

0777 023 444

Explanation: Filtration of blood occurs in Bowman's capsule, which surrounds the glomerulus.

4. Which hormone regulates water reabsorption in the kidneys?

A) Insulin
B) Aldosterone
C) Vasopressin (ADH)
D) Thyroxine

Answer: C
Explanation: Vasopressin, also known as antidiuretic hormone (ADH), regulates water reabsorption in the kidneys.

5. What is the functional unit of the kidney responsible for urine formation?

A) Nephron
B) Glomerulus
C) Renal pelvis
D) Renal capsule

Answer: A

3 0777 023 444

Explanation: The nephron is the functional unit of the kidney responsible for urine formation.

6. Which part of the nephron is responsible for the majority of water reabsorption?

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

Answer: A
Explanation: The loop of Henle, especially the descending limb, is responsible for the majority of water reabsorption.

7. What is the normal pH range of urine?

A) 5.0-6.0
B) 6.5-7.5
C) 7.0-8.0
D) 8.5-9.5

Answer: B
Explanation: The normal pH range of urine is 6.5-7.5.

0777 023 444

8. Which blood vessel carries blood away from the kidney?

A) Renal artery
B) Renal vein
C) Inferior vena cava
D) Aorta

Answer: B
Explanation: The renal vein carries filtered blood away from the kidney.

9. Which structure connects the kidneys to the urinary bladder?

A) Urethra
B) Ureter
C) Renal pelvis
D) Collecting duct

Answer: B
Explanation: Ureters connect the kidneys to the urinary bladder.

0777 023 444

10. What is the role of the juxtaglomerular apparatus in the kidney?
- A) Acid-base balance
- B) Blood pressure regulation
- C) Water reabsorption
- D) Glucose filtration

Answer: B
Explanation: The juxtaglomerular apparatus plays a role in blood pressure regulation through the release of renin.

11. In which part of the nephron does most nutrient reabsorption occur?
- A) Distal convoluted tubule
- B) Loop of Henle
- C) Proximal convoluted tubule
- D) Collecting duct

Answer: C
Explanation: Most nutrient reabsorption occurs in the proximal convoluted tubule.

12. Which hormone stimulates the production of red blood cells in response to low oxygen levels?
- A) Erythropoietin

 0777 023 444

- B) Insulin
- C) Aldosterone
- D) Thyroxine

Answer: A
Explanation: Erythropoietin stimulates the production of red blood cells in response to low oxygen levels.

13. Which of the following substances is actively secreted into the renal tubules for elimination?
- A) Urea
- B) Creatinine
- C) Sodium ions
- D) Glucose

Answer: B
Explanation: Creatinine is actively secreted into the renal tubules for elimination.

14. What is the purpose of the countercurrent multiplier system in the kidney?
- A) To maintain blood pH
- B) To regulate blood pressure
- C) To enhance water reabsorption
- D) To increase glomerular filtration rate

7 0777 023 444

Answer: C
Explanation: The countercurrent multiplier system enhances water reabsorption in the kidneys, especially in the loop of Henle.

15. What role do podocytes play in the filtration process of the kidneys?
- A) They secrete renin
- B) They regulate blood pressure
- C) They form the filtration barrier
- D) They control erythropoiesis

Answer: C
Explanation: Podocytes form the filtration barrier in the glomerulus, preventing the passage of large molecules into the renal tubules.

16. Which of the following is a symptom of renal failure?
- A) Polyuria
- B) Hematuria
- C) Oliguria
- D) Glycosuria

Answer: C

8 0777 023 444

Explanation: Oliguria, reduced urine output, is a symptom of renal failure.

17. What is the primary source of ammonia in the urine?
- A) Amino acids
- B) Urea
- C) Creatinine
- D) Glucose

Answer: A
Explanation: Amino acids are broken down to form ammonia, which is a component of urine.

18. What is the function of the urethra in the excretory system?
- A) Filtration
- B) Storage of urine
- C) Conduction of urine out of the body
- D) Reabsorption of water

Answer: C
Explanation: The urethra conducts urine out of the body.

9 0777 023 444

19. Which part of the nephron is responsible for the secretion of hydrogen ions and potassium ions?
- A) Proximal convoluted tubule
- B) Distal convoluted tubule
- C) Loop of Henle
- D) Bowman's capsule

Answer: B
Explanation: The distal convoluted tubule is responsible for the secretion of hydrogen ions and potassium ions.

20. What is the role of antidiuretic hormone (ADH) in the excretory system?
- A) Increase urine production
- B) Decrease urine production
- C) Increase blood pressure
- D) Stimulate erythropoiesis

Answer: B
Explanation: Antidiuretic hormone (ADH) decreases urine production by increasing water reabsorption in the kidneys.

21. Which of the following is not a component of the filtrate formed in Bowman's capsule?

- A) Water
- B) Glucose
- C) Red blood cells
- D) Urea

Answer: C
Explanation: Red blood cells are not normally present in the filtrate; they are too large to pass through the filtration barrier.

22. Which part of the kidney is responsible for the filtration of blood and the formation of urine?
- A) Renal medulla
- B) Renal cortex
- C) Renal pelvis
- D) Renal hilum

Answer: B
Explanation: The renal cortex contains the glomeruli where blood filtration occurs, leading to urine formation.

23. What is the primary nitrogenous waste product excreted in urine?
- A) Urea
- B) Ammonia

 0777 023 444

- C) Creatinine
- D) Bilirubin

Answer: A
Explanation: Urea is the primary nitrogenous waste product excreted in urine.

24. Which blood vessel supplies the kidneys with oxygenated blood for filtration?
- A) Renal artery
- B) Renal vein
- C) Inferior vena cava
- D) Aorta

Answer: A
Explanation: The renal artery supplies the kidneys with oxygenated blood for filtration.

25. Which ion is actively reabsorbed in the distal convoluted tubule to regulate calcium levels in the body?
- A) Sodium
- B) Potassium
- C) Calcium
- D) Chloride

0777 023 444

Answer: C
Explanation: Calcium ions are actively reabsorbed in the distal convoluted tubule to regulate calcium levels in the body.

26. What is the term for the process of urine production in the kidneys?
- A) Filtration
- B) Secretion
- C) Reabsorption
- D) Micturition

Answer: A
Explanation: Filtration is the process of urine production in the kidneys.

27. Which of the following is a hormone produced by the kidneys that regulates red blood cell production?
- A) Aldosterone
- B) Erythropoietin
- C) Vasopressin
- D) Insulin

Answer: B

 0777 023 444

Explanation: Erythropoietin is a hormone produced by the kidneys that regulates red blood cell production.

28. What is the term for the process of expelling urine from the bladder?
- A) Filtration
- B) Reabsorption
- C) Micturition
- D) Secretion

Answer: C
Explanation: Micturition is the process of expelling urine from the bladder.

29. Which part of the nephron is responsible for the reabsorption of water and ions?
- A) Proximal convoluted tubule
- B) Loop of Henle
- C) Distal convoluted tubule
- D) Collecting duct

Answer: D
Explanation: The collecting duct is responsible for the reabsorption of water and ions.

30. What is the function of the Bowman's capsule in the nephron?
- A) Filtration of blood
- B) Reabsorption of water
- C) Secretion of waste products
- D) Storage of urine

Answer: A
Explanation: Bowman's capsule is responsible for the initial filtration of blood in the nephron.

31. Which of the following is a characteristic of glomerular filtration rate (GFR)?
- A) It is increased by dilation of the afferent arteriole
- B) It is decreased by dilation of the efferent arteriole
- C) It is unaffected by changes in blood pressure
- D) It is higher in conditions of dehydration

Answer: A
Explanation: Glomerular filtration rate (GFR) is increased by dilation of the afferent arteriole, allowing more blood to enter the glomerulus for filtration.

 0777 023 444

32. What is the primary role of the loop of Henle in the nephron?
- A) Filtration of blood
- B) Reabsorption of glucose
- C) Regulation of blood pressure
- D) Concentration of urine

Answer: D
Explanation: The primary role of the loop of Henle is to concentrate urine by reabsorbing water.

33. What is the significance of the renin-angiotensin-aldosterone system (RAAS) in kidney function?
- A) It increases blood pressure
- B) It decreases blood volume
- C) It regulates water reabsorption
- D) It stimulates glucose production

Answer: A
Explanation: The renin-angiotensin-aldosterone system (RAAS) plays a role in increasing blood pressure.

34. Which of the following conditions may lead to the formation of kidney stones?

 0777 023 444

- A) Hypertension
- B) Hypercalcemia
- C) Hypoglycemia
- D) Hyperkalemia

Answer: B
Explanation: Hypercalcemia, an elevated level of calcium in the blood, may contribute to the formation of kidney stones.

35. Which substance is typically absent or present in low levels in normal urine?
- A) Urea
- B) Glucose
- C) Creatinine
- D) Albumin

Answer: B
Explanation: Glucose is typically absent or present in low levels in normal urine. Elevated glucose levels in urine may indicate diabetes.

36. What is the role of the proximal convoluted tubule in urine formation?
- A) Filtration of blood
- B) Reabsorption of water

 0777 023 444

- C) Secretion of waste products
- D) Regulation of blood pressure

Answer: C
Explanation: The proximal convoluted tubule is involved in the secretion of waste products into the urine.

37. What is the term for the network of capillaries responsible for blood filtration in the kidneys?
- A) Renal artery
- B) Renal vein
- C) Glomerulus
- D) Bowman's capsule

Answer: C
Explanation: The glomerulus is the network of capillaries responsible for blood filtration in the kidneys.

0777 023 444