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Biology Grade 12 — Chapter 4

Urinary System of Man

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Independent practice MCQs from the supplied Class 12 Biology notes pack. Total: 50 questions.

A. Important / Main Topics

1. Excretion is the removal of:

(A) Chemical waste produced by metabolic processes
(B) Undigested food
(C) Excess water only
(D) Carbon dioxide only

Correct Answer: A

Explanation: Excretion is the removal of chemical waste from the body which are produced by the metabolic processes within cells.

2. Animals that excrete ammonia as their major nitrogenous waste are called:

(A) Ureotelic
(B) Ammonotelic
(C) Uricotelic
(D) Osmoconformers

Correct Answer: B

Explanation: Animals which excrete ammonia as their major nitrogenous waste product are called ammonotelic.

3. Which nitrogenous waste requires the least amount of water for excretion?

(A) Ammonia
(B) Urea
(C) Uric acid
(D) Creatinine

Correct Answer: C

Explanation: One gram of nitrogen, in the form of uric acid, requires just 1 ml of water for its excretion.

4. The functional unit of the kidney is the:

(A) Neuron
(B) Alveolus
(C) Villus
(D) Nephron

Correct Answer: D

Explanation: The nephron is the functional unit of kidney.

5. The kidneys lie between which vertebrae?

(A) Twelfth thoracic and third lumbar
(B) First and fifth lumbar
(C) Fifth thoracic and first lumbar
(D) First cervical and first thoracic

Correct Answer: A

Explanation: Twelfth thoracic and third lumbar — this correctly answers the question.

6. The tube that carries urine from the kidney to the urinary bladder is the:

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

Correct Answer: B

Explanation: Each ureter is a tubular organ about 25 cm long that transports urine from the kidney to the urinary bladder.

7. The outer region of the kidney is called the:

(A) Medulla
(B) Pelvis
(C) Cortex
(D) Hilum

Correct Answer: C

Explanation: The renal cortex is the outer region of the kidney.

8. The renal pelvis leads to the:

(A) Urethra
(B) Bladder
(C) Collecting duct
(D) Ureter

Correct Answer: D

Explanation: The renal pelvis leads to the Ureter.

9. The process of glomerular filtration takes place in the:

(A) Renal corpuscle
(B) Renal tubule
(C) Collecting duct
(D) Loop of Henle

Correct Answer: A

Explanation: The process of glomerular filtration takes place in the Renal corpuscle.

10. The pH range of normal urine is:

(A) 2.0 to 4.0
(B) 4.8 to 7.5
(C) 7.5 to 9.0
(D) 1.0 to 3.0

Correct Answer: B

Explanation: Normal urine has pH range from 4.8 to 7.5.

11. The countercurrent multiplier mechanism is responsible for:

(A) Filtration of blood
(B) Secretion of hormones
(C) Concentration of urine
(D) Production of red blood cells

Correct Answer: C

Explanation: The formation of hypertonic urine is achieved by the countercurrent multiplier mechanism.

12. The kidneys function as:

(A) Excretory organs only
(B) Osmoregulatory organs only
(C) Digestive organs
(D) Both excretory and osmoregulatory organs

Correct Answer: D

Explanation: Kidneys function as excretory as well as osmoregulatory organs.

13. Urinary tract infections are more common in:

(A) Women
(B) Men
(C) Children

(D) Elderly

Correct Answer: A

Explanation: UTIs are fifty times more common in women than in men.

14. The condition of having stones in the kidney is termed:

(A) Nephritis
(B) Nephrolithiasis
(C) Nephrosis
(D) Uremia

Correct Answer: B

Explanation: The condition of having stones in the kidney is termed nephrolithiasis.

15. The procedure to filter toxins from the blood by artificial methods is called:

(A) Transplant
(B) Lithotripsy
(C) Dialysis
(D) Angioplasty

Correct Answer: C

Explanation: A procedure to filter toxins from the blood by artificial methods when the kidneys are unable to perform this function is called renal dialysis.

16. Which nitrogenous waste is most toxic?

(A) Urea
(B) Uric acid
(C) Creatinine
(D) Ammonia

Correct Answer: D

Explanation: Ammonia is highly toxic because it tends to raise the pH of body fluids and interferes with membrane transport functions.

17. Why is the right kidney slightly lower than the left?

(A) The liver occupies space on the right side
(B) The left kidney is bigger
(C) The heart occupies space on the left side
(D) The right kidney is smaller

Correct Answer: A

Explanation: The reason why the right kidney is slightly lower than the left is due to considerable space occupied by the liver on the right side.

18. What is the function of the renal capsule?

(A) Filters blood
(B) Protects the kidney from injury
(C) Produces urine
(D) Secretes hormones

Correct Answer: B

Explanation: The renal capsule protects the kidneys from injury, increases their stability, and connects kidneys to surrounding tissues.

19. What is the function of the renal cortex?

(A) Concentration of urine
(B) Collection of urine
(C) Filtration of blood and production of EPO
(D) Transport of urine

Correct Answer: C

Explanation: Filtration of blood and production of EPO — this correctly answers the question.

20. What is the function of the renal medulla?

(A) Filtration of blood
(B) Production of EPO
(C) Collection of urine
(D) Contains nephrons and renal tubules

Correct Answer: D

Explanation: The renal medulla contains most of the nephrons with their glomeruli and renal tubules.

21. What is the function of the loop of Henle?

(A) Concentration of urine
(B) Filtration of blood
(C) Collection of urine
(D) Secretion of hormones

Correct Answer: A

Explanation: The loop of Henle creates a concentration gradient in the medulla that allows water reabsorption and urine concentration.

22. What is the function of aldosterone in urine concentration?

(A) Promotes water reabsorption
(B) Controls sodium chloride transport
(C) Increases blood pressure
(D) Decreases urine volume

Correct Answer: B

Explanation: As fluid travels up the ascending limb, sodium chloride is transported actively out of the limb, and this movement is controlled by aldosterone.

23. What is the function of antidiuretic hormone (ADH)?

(A) Controls sodium chloride transport
(B) Increases urine volume
(C) Promotes water reabsorption
(D) Decreases blood pressure

Correct Answer: C

Explanation: The movement of water out of the descending limb is promoted by antidiuretic hormone which is secreted from posterior lobe of pituitary.

24. What type of urine is formed during dehydration?

(A) Diluted urine
(B) Alkaline urine
(C) Acidic urine
(D) Concentrated urine

Correct Answer: D

Explanation: Concentrated urine — this correctly answers the question.

25. What type of urine is formed during flooding (excess water)?

(A) Diluted urine
(B) Concentrated urine
(C) Alkaline urine
(D) Acidic urine

Correct Answer: A

Explanation: Diluted urine — this correctly answers the question.

B. Less Important / Secondary Topics

26. What is the function of the proximal convoluted tubule?

(A) Reabsorption of useful substances
(B) Filtration of blood

(C) Collection of urine
(D) Secretion of hormones

Correct Answer: A

Explanation: The proximal convoluted tubule is the major site of reabsorption of useful substances.

27. What is the function of the distal convoluted tubule?

(A) Filtration of blood
(B) Secretion and some reabsorption
(C) Collection of urine
(D) Production of EPO

Correct Answer: B

Explanation: The distal convoluted tubule is the site of secretion and some reabsorption.

28. What is the function of the collecting duct?

(A) Filtration of blood
(B) Production of EPO
(C) Concentration of urine
(D) Secretion of hormones

Correct Answer: C

Explanation: Concentration of urine — this correctly answers the question.

29. Which of the following is a treatment for kidney stones using shock waves?

(A) PCNL
(B) Dialysis
(C) Transplant
(D) ESWL

Correct Answer: D

Explanation: In ESWL, an instrument called lithotripter is used to generate shock waves from outside the patient's body focused on the stone.

30. Which of the following is a treatment for larger kidney stones using a tube inserted from the back?

(A) PCNL
(B) ESWL
(C) Dialysis
(D) Transplant

Correct Answer: A

Explanation: In PCNL, a tube is inserted from the patient's back into the kidney to create a tract.

31. Which type of kidney stone forms in acidic urine?

(A) Calcium phosphate
(B) Calcium oxalate
(C) Magnesium ammonium phosphate
(D) Cystine

Correct Answer: B

Explanation: When urine is acidic (low pH), the stone is of calcium oxalate.

32. Which type of kidney stone forms in alkaline urine?

(A) Calcium oxalate
(B) Uric acid
(C) Calcium phosphate
(D) Cystine

Correct Answer: C

Explanation: When the urine is alkaline (high pH), the stone is of calcium phosphate.

33. What is the function of the peritubular capillaries?

(A) Filtration of blood

(B) Collection of urine
(C) Secretion of hormones
(D) Reabsorption of substances

Correct Answer: D

Explanation: The peritubular capillaries surround the proximal and distal tubules and are involved in reabsorption.

34. What is the function of the vasa recta?

(A) Concentration of urine
(B) Filtration of blood
(C) Collection of urine
(D) Secretion of hormones

Correct Answer: A

Explanation: The vasa recta course into the medulla along with the loops of Henle and help maintain the concentration gradient.

35. What is the function of the renal vein?

(A) Brings blood to the kidney
(B) Carries filtered blood away from the kidney
(C) Produces urine
(D) Secretes hormones

Correct Answer: B

Explanation: The renal vein is the main blood vessel that carries filtered blood out of the kidneys and back to the heart.

36. A patient has a condition that causes excessive ADH secretion. Which of the following would be the most likely consequence?

(A) Increased urine volume
(B) Increased sodium excretion
(C) Decreased urine volume
(D) Decreased blood pressure

Correct Answer: C

Explanation: Decreased urine volume — this correctly answers the question.

37. A patient has a deficiency of ADH. Which of the following would be the most likely consequence?

(A) Diabetes mellitus
(B) Kidney stones
(C) Hypertension
(D) Diabetes insipidus

Correct Answer: D

Explanation: Diabetes insipidus — this correctly answers the question.

38. A patient has a blockage in the ureter. Which of the following would be the most likely consequence?

(A) Decreased urine flow to the bladder
(B) Increased urine flow to the bladder
(C) Increased blood flow to the kidney
(D) Decreased blood flow to the kidney

Correct Answer: A

Explanation: The ureter transports urine from the kidney to the urinary bladder; blockage would decrease urine flow.

39. A patient has damage to the glomerulus. Which of the following would be most affected?

(A) Reabsorption of water
(B) Filtration of blood
(C) Secretion of hormones
(D) Collection of urine

Correct Answer: B

Explanation: The glomerulus is the site of filtration; damage would impair filtration.

40. A patient has a condition that causes increased permeability of the collecting duct to water. Which of the following would be the most likely consequence?

(A) Increased urine volume
(B) Increased sodium excretion
(C) Decreased urine volume
(D) Decreased blood pressure

Correct Answer: C

Explanation: Decreased urine volume — this correctly answers the question.

41. A patient with chronic kidney failure has a buildup of urea in the blood. This condition is called:

(A) Nephritis
(B) Nephrolithiasis
(C) Diabetes insipidus
(D) Uremia

Correct Answer: D

Explanation: Chronic kidney failure can progress to end-stage renal disease (ESRD) and uremia, which is fatal unless treated.

42. A patient has a condition that causes increased calcium in the blood. Which type of kidney stone is most likely to form?

(A) Calcium oxalate
(B) Uric acid
(C) Cystine
(D) Magnesium ammonium phosphate

Correct Answer: A

Explanation: Increased calcium in the blood (hypercalcemia) causes high calcium in the urine (hypercalciuria), which can lead to calcium oxalate stones.

43. A patient has a condition that causes increased uric acid in the blood. Which type of kidney stone is most likely to form?

(A) Calcium oxalate
(B) Uric acid
(C) Cystine
(D) Magnesium ammonium phosphate

Correct Answer: B

Explanation: Hyperuricemia is the increased amount of uric acid in the blood and it causes uric acid type of kidney stones.

44. A patient with a kidney transplant stops taking immunosuppressive drugs. Which of the following would be the most likely consequence?

(A) Improved kidney function
(B) Increased urine production
(C) Rejection of the transplanted kidney
(D) Decreased blood pressure

Correct Answer: C

Explanation: If a recipient stops taking the medications, rejection can occur; even ten or fifteen years after the transplant.

45. Which of the following correctly describes the pathway of blood through the nephron?

(A) Efferent arteriole → glomerulus → afferent arteriole → peritubular capillaries → renal vein
(B) Afferent arteriole → peritubular capillaries → glomerulus → efferent arteriole → renal vein
(C) Afferent arteriole → glomerulus → peritubular capillaries → efferent arteriole → renal vein
(D) Afferent arteriole → glomerulus → efferent arteriole → peritubular capillaries → renal vein

Correct Answer: D

Explanation: Afferent arteriole → glomerulus → efferent arteriole → peritubular capillaries → renal vein — this correctly answers the question.

46. A patient has a condition that causes decreased blood pressure. Which of the following would most likely occur?

(A) Increased ADH secretion
(B) Decreased ADH secretion
(C) Increased urine volume
(D) Decreased water reabsorption

Correct Answer: A

Explanation: ADH is produced during states of decreased blood volume and low blood pressure; secretion would increase to promote water retention.

47. Which of the following correctly describes the countercurrent multiplier mechanism?

(A) Blood and filtrate flow in the same direction
(B) Blood and filtrate flow in opposite directions
(C) Blood and filtrate flow at right angles
(D) Blood and filtrate do not flow

Correct Answer: B

Explanation: Blood and filtrate flow in opposite directions — this correctly answers the question.

48. A patient has a condition that causes increased sodium reabsorption in the kidneys. Which of the following would be the most likely consequence?

(A) Increased urine volume
(B) Decreased blood pressure
(C) Increased blood pressure
(D) Decreased blood volume

Correct Answer: C

Explanation: Increased sodium reabsorption leads to increased water retention and increased blood volume, which increases blood pressure.

49. Which of the following correctly describes the role of the kidneys in acid-base balance?

(A) They excrete bicarbonate and reabsorb hydrogen ions
(B) They produce carbon dioxide
(C) They produce oxygen
(D) They excrete hydrogen ions and reabsorb bicarbonate

Correct Answer: D

Explanation: They excrete hydrogen ions and reabsorb bicarbonate — this correctly answers the question.

50. A patient has a condition that causes increased protein in the urine. Which of the following is the most likely explanation?

(A) Damage to the glomerulus
(B) Increased blood pressure
(C) Decreased ADH
(D) Increased aldosterone

Correct Answer: A

Explanation: The glomerulus normally prevents proteins from being filtered; damage to the glomerulus would allow protein to appear in the urine.