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Biology Grade 12 — Chapter 1

Digestive 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. The oral cavity is also known as the:

(A) Buccal cavity
(B) Pharyngeal cavity
(C) Thoracic cavity
(D) Abdominal cavity

Correct Answer: A

Explanation: The oral cavity is more commonly known as the buccal cavity and is surrounded by the lips, cheeks, a tongue and a palate.

2. The rough projections on the surface of the tongue are called:

(A) Villi
(B) Papillae
(C) Microvilli
(D) Cilia

Correct Answer: B

Explanation: The tongue has rough projections called papillae on its surface which cause friction useful in handling the food and also contain taste buds.

3. How many pairs of salivary glands are there in the oral cavity?

(A) One
(B) Two
(C) Three
(D) Four

Correct Answer: C

Explanation: There are three pairs of salivary glands: parotid glands, submandibular glands, and sublingual glands.

4. The enzyme salivary amylase digests starch into:

(A) Glucose only
(B) Amino acids
(C) Fatty acids and glycerol
(D) Maltose, maltotriose, and isomaltose

Correct Answer: D

Explanation: The enzyme salivary amylase digests starch into Maltose, maltotriose, and isomaltose.

5. The wave-like muscular contraction that propels food through the digestive tract is called:

(A) Peristalsis
(B) Segmentation
(C) Mastication
(D) Emulsification

Correct Answer: A

Explanation: Peristalsis is a wave-like muscular contraction that propels food and fluids through the digestive tract and other tubular organs.

6. Which sphincter is located at the opening of the upper esophagus?

(A) Lower esophageal sphincter
(B) Upper esophageal sphincter

(C) Pyloric sphincter
(D) Ileocecal sphincter

Correct Answer: B

Explanation: At the opening of the upper esophagus, there is a ring-shaped muscle called the upper esophageal sphincter (UES).

7. The stomach is composed of how many layers of smooth muscles?

(A) One
(B) Two
(C) Three
(D) Four

Correct Answer: C

Explanation: Three — this correctly answers the question.

8. Which cells of the gastric glands secrete hydrochloric acid?

(A) Chief cells
(B) Endocrine cells
(C) Surface mucous cells
(D) Parietal cells

Correct Answer: D

Explanation: Parietal cells — this correctly answers the question.

9. The hormone that stimulates gastric juice secretion is:

(A) Gastrin
(B) Secretin
(C) Cholecystokinin
(D) Insulin

Correct Answer: A

Explanation: Gastrin is released by endocrine cells in the gastric glands of the pyloric region and stimulates additional gastric juice secretion.

10. The first part of the small intestine is the:

(A) Jejunum
(B) Duodenum
(C) Ileum
(D) Cecum

Correct Answer: B

Explanation: The duodenum is the first part of the small intestine, ranging from 20–25 cm in length.

11. Trypsinogen is activated to trypsin by:

(A) Hydrochloric acid
(B) Gastrin
(C) Enterokinase
(D) Pepsin

Correct Answer: C

Explanation: The intestinal glands secrete an activator enzyme called enterokinase which converts trypsinogen into trypsin.

12. The major site of nutrient absorption is the:

(A) Duodenum
(B) Jejunum
(C) Stomach
(D) Ileum

Correct Answer: D

Explanation: The ileum is the major site of nutrient absorption.

13. Which vitamin is produced by bacteria in the large intestine?

(A) Vitamin K
(B) Vitamin A
(C) Vitamin C
(D) Vitamin D

Correct Answer: A

Explanation: The most important vitamins produced by bacteria in the large intestine are Vitamin K and Biotin.

14. The process of expelling feces from the digestive tract through the anus is called:

(A) Deglutition
(B) Defecation
(C) Mastication
(D) Emulsification

Correct Answer: B

Explanation: Defecation is the term for the act of expelling feces from the digestive tract via the anus.

15. Bile is produced by the:

(A) Gall bladder
(B) Pancreas
(C) Liver
(D) Stomach

Correct Answer: C

Explanation: Bile is manufactured in the liver but stored in the gall bladder.

16. Which enzyme in saliva begins the digestion of fats?

(A) Salivary amylase
(B) Pepsin
(C) Trypsin
(D) Lingual lipase

Correct Answer: D

Explanation: Lingual lipase — this correctly answers the question.

17. During the pharyngeal phase of swallowing, which structure covers the larynx to prevent food from entering the trachea?

(A) Epiglottis
(B) Soft palate
(C) Uvula
(D) Tongue

Correct Answer: A

Explanation: The epiglottis is pushed backward over the larynx, protecting the airways and preventing food from entering the trachea.

18. What is the primary function of intrinsic factor secreted by parietal cells?

(A) Digestion of proteins
(B) Absorption of vitamin B12
(C) Emulsification of fats
(D) Activation of pepsinogen

Correct Answer: B

Explanation: Intrinsic factor is a glycoprotein that binds with vitamin B12 and makes the vitamin readily absorbable in the ileum.

19. Why is pepsinogen secreted in an inactive form?

(A) To digest carbohydrates
(B) To activate parietal cells
(C) To protect the chief cells from self-digestion

(D) To neutralize stomach acid

Correct Answer: C

Explanation: To protect the chief cells from self-digestion — this correctly answers the question.

20. Which hormone stimulates the pancreas to secrete bicarbonate?

(A) Gastrin
(B) Cholecystokinin
(C) Insulin
(D) Secretin

Correct Answer: D

Explanation: The predominant effect of secretin on the pancreas is to stimulate duct cells to secrete water and bicarbonate.

21. Where does the absorption of most carbohydrates and proteins occur?

(A) Small intestine
(B) Stomach
(C) Duodenum
(D) Large intestine

Correct Answer: A

Explanation: The small intestine, particularly the ileum, is the major site of nutrient absorption.

22. Which of the following is absorbed into lacteals rather than blood capillaries?

(A) Glucose
(B) Fatty acids and glycerol
(C) Amino acids
(D) Vitamins

Correct Answer: B

Explanation: Lipids are absorbed as fatty acids and glycerol into the lacteals (lymph vessels) of the villi.

23. What is the function of bile salts in digestion?

(A) Digest proteins
(B) Digest carbohydrates
(C) Emulsify fats
(D) Absorb vitamins

Correct Answer: C

Explanation: Bile salts reduce the surface tension of fat globules and emulsify them into droplets, increasing surface area for lipase action.

24. What is the pH of pancreatic juice?

(A) About 2
(B) About 5
(C) About 10
(D) About 8

Correct Answer: D

Explanation: Pancreatic juice is slightly alkaline with a pH of about 8, which neutralizes the acidic chyme from the stomach.

25. The reflex that allows defecation in infants is:

(A) Involuntary
(B) Voluntary
(C) Conditioned
(D) Learned

Correct Answer: A

Explanation: In infants, the defecation reflex is involuntary; the anal sphincter relaxes automatically to allow stool to pass.

B. Less Important / Secondary Topics

26. Which of the following is a function of the liver related to protein metabolism?

(A) Conversion of ammonia to urea
(B) Production of bile
(C) Storage of glycogen
(D) Production of insulin

Correct Answer: A

Explanation: The liver converts poisonous ammonia to urea, which is an end product of protein metabolism and is excreted in the urine.

27. What is the function of the hormone cholecystokinin (CCK)?

(A) Stimulates bicarbonate secretion
(B) Stimulates bile release from the gallbladder
(C) Inhibits gastric secretion
(D) Stimulates insulin release

Correct Answer: B

Explanation: Stimulates bile release from the gallbladder — this correctly answers the question.

28. The appendix is attached to the:

(A) Transverse colon
(B) Descending colon
(C) Cecum
(D) Ascending colon

Correct Answer: C

Explanation: The appendix is a small blind tube about 9 cm long attached to the caecum.

29. What is the primary function of the large intestine?

(A) Digestion of proteins
(B) Production of bile
(C) Secretion of insulin
(D) Absorption of water and electrolytes

Correct Answer: D

Explanation: Absorption of water and electrolytes — this correctly answers the question.

30. Which part of the small intestine receives both bile and pancreatic juice?

(A) Duodenum
(B) Jejunum
(C) Ileum
(D) Cecum

Correct Answer: A

Explanation: The duodenum receives pancreatic juice through the pancreatic duct and bile from the liver/gallbladder.

31. What is the function of the lower esophageal sphincter (LES)?

(A) Allows food into the esophagus
(B) Prevents stomach acid from entering the esophagus
(C) Regulates passage of chyme into the duodenum
(D) Prevents backflow into the ileum

Correct Answer: B

Explanation: The LES usually stays shut to prevent stomach acid and digestive juices from getting into the esophagus.

32. Which of the following is NOT a component of pancreatic juice?

(A) Pancreatic amylase
(B) Pancreatic lipase

(C) Pepsinogen
(D) Trypsinogen

Correct Answer: C

Explanation: Pepsinogen is secreted by chief cells of the stomach, not by the pancreas.

33. The submucosal plexus is located:

(A) Between the outer longitudinal and inner circular smooth muscle layers
(B) Outside the serosa
(C) In the mucosa
(D) In the submucosa

Correct Answer: D

Explanation: The submucosal plexus (Meissner's plexus) is located in the submucosa of the digestive tract.

34. What is the function of the pyloric sphincter?

(A) Regulates passage of chyme into the duodenum
(B) Prevents backflow of food into the esophagus
(C) Allows food to enter the stomach
(D) Prevents backflow into the ileum

Correct Answer: A

Explanation: Regulates passage of chyme into the duodenum — this correctly answers the question.

35. Which of the following correctly describes the myenteric plexus?

(A) It secretes digestive enzymes
(B) It controls motility along the gastrointestinal tract
(C) It produces bile
(D) It absorbs nutrients

Correct Answer: B

Explanation: It controls motility along the gastrointestinal tract — this correctly answers the question.

36. A patient has a condition where the lower esophageal sphincter (LES) fails to close properly. Which of the following is the most likely consequence?

(A) Inability to swallow food
(B) Rapid gastric emptying
(C) Stomach acid reflux into the esophagus
(D) Increased bile production

Correct Answer: C

Explanation: The LES normally stays shut to prevent stomach acid from entering the esophagus; if it fails to close, acid reflux occurs.

37. If the parietal cells of the stomach were destroyed, which of the following would be the most direct consequence?

(A) Loss of pepsinogen secretion
(B) Increased carbohydrate digestion
(C) Increased fat absorption
(D) Impaired protein digestion due to lack of pepsin activation

Correct Answer: D

Explanation: Parietal cells secrete HCl, which is required to convert inactive pepsinogen to active pepsin; without HCl, protein digestion would be impaired.

38. A patient with a duodenal ulcer has excess gastric acid entering the duodenum. Which hormone would be released in response to this acidic chyme?

(A) Secretin
(B) Gastrin
(C) Insulin
(D) Glucagon

Correct Answer: A

Explanation: Acidic chyme in the duodenum stimulates endocrine cells to release secretin, which stimulates bicarbonate secretion to neutralize the acid.

39. A person is unable to absorb fat-soluble vitamins despite normal bile production. Which of the following is the most likely explanation?

(A) Impaired emulsification of fats
(B) Impaired pancreatic lipase activity
(C) Impaired glucose absorption
(D) Impaired amino acid absorption

Correct Answer: B

Explanation: Bile emulsifies fats, but pancreatic lipase is required to digest triglycerides into fatty acids and glycerol; without lipase, fat digestion and subsequent absorption of fat-soluble vitamins would be impaired.

40. Which of the following would occur if the ileum were surgically removed?

(A) Increased absorption of vitamin B12
(B) Increased protein digestion
(C) Decreased absorption of bile salts and vitamin B12
(D) Increased carbohydrate digestion

Correct Answer: C

Explanation: The ileum is the major site of nutrient absorption, including bile salts and vitamin B12 (with intrinsic factor).

41. A patient has a tumor in the pyloric region of the stomach, causing excessive gastrin secretion. Which of the following is the most likely result?

(A) Decreased gastric acid secretion
(B) Increased bile production
(C) Decreased pancreatic enzyme secretion
(D) Increased gastric acid secretion

Correct Answer: D

Explanation: Increased gastric acid secretion — this correctly answers the question.

42. Which of the following best explains why the stomach does not digest itself?

(A) A thick layer of alkaline mucus protects the epithelial cells
(B) The stomach lining is made of keratin
(C) Gastric juice is not acidic
(D) Pepsin is inactive at body temperature

Correct Answer: A

Explanation: The mucus cells secrete viscous and alkaline mucus which lubricates and protects the epithelial cells from the damaging effect of acidic chyme and pepsin.

43. A patient with a blockage in the common bile duct would have impaired digestion of:

(A) Proteins
(B) Fats
(C) Carbohydrates
(D) Nucleic acids

Correct Answer: B

Explanation: Bile is required for emulsification of fats; a blocked bile duct would impair fat digestion.

44. Which of the following correctly describes the relationship between CCK and secretin?

(A) Both are released in response to acidic chyme
(B) Both stimulate gastric acid secretion
(C) CCK stimulates bile release; secretin stimulates bicarbonate secretion
(D) Secretin stimulates bile release; CCK stimulates bicarbonate secretion

Correct Answer: C

Explanation: CCK stimulates bile release; secretin stimulates bicarbonate secretion — this correctly answers the question.

45. A patient with chronic pancreatitis has reduced pancreatic enzyme secretion. Which of the following would be most affected?

(A) Absorption of water
(B) Absorption of vitamin K
(C) Production of bile
(D) Digestion of proteins, fats, and carbohydrates

Correct Answer: D

Explanation: Pancreatic juice contains enzymes for all major classes of food; reduced secretion would impair digestion of proteins, fats, and carbohydrates.

46. Which of the following is the correct sequence of structures through which food passes?

(A) Oral cavity → esophagus → stomach → small intestine → large intestine
(B) Oral cavity → stomach → esophagus → small intestine → large intestine
(C) Oral cavity → esophagus → small intestine → stomach → large intestine
(D) Oral cavity → stomach → small intestine → esophagus → large intestine

Correct Answer: A

Explanation: Food passes from the oral cavity to the esophagus, then to the stomach, small intestine, and large intestine.

47. A patient has a deficiency of enterokinase. Which of the following would be the most direct consequence?

(A) Impaired bile production
(B) Impaired activation of trypsinogen
(C) Impaired gastric acid secretion
(D) Impaired absorption of glucose

Correct Answer: B

Explanation: Impaired activation of trypsinogen — this correctly answers the question.

48. Which of the following statements about the liver is INCORRECT?

(A) It produces bile
(B) It stores glycogen
(C) It produces insulin
(D) It detoxifies harmful substances

Correct Answer: C

Explanation: Insulin is produced by the beta cells of the pancreas, not by the liver.

49. A patient with a vitamin K deficiency may have impaired blood clotting. Which of the following best explains this?

(A) Vitamin K is required for bile production
(B) Vitamin K is required for platelet production
(C) Vitamin K is required for hemoglobin synthesis
(D) Vitamin K is required for synthesis of clotting factors

Correct Answer: D

Explanation: Vitamin K is essential for blood clotting; deficiency can lead to bleeding problems.

50. Which of the following correctly describes the role of the hepatic portal system?

(A) Carries nutrient-rich blood from the digestive organs to the liver
(B) Carries oxygenated blood to the liver
(C) Carries blood from the liver to the heart
(D) Carries blood from the heart to the digestive organs

Correct Answer: A

Explanation: The hepatic portal vein carries blood from the digestive organs to the liver for processing and detoxification.

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Biology Grade 12 — Chapter 2

Blood Circulatory 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. The heart is located within the:

(A) Mediastinum
(B) Pericardium
(C) Pleural cavity
(D) Abdominal cavity

Correct Answer: A

Explanation: The heart is within the mediastinum, which is bordered laterally by the lungs, posteriorly by the backbone and anteriorly by the sternum.

2. The pericardium is a:

(A) Muscular layer of the heart
(B) Closed sac that surrounds the heart
(C) Valve between atria and ventricles
(D) Blood vessel supplying the heart

Correct Answer: B

Explanation: The pericardium is a closed sac that surrounds the heart and is a fibrous membrane found as an external covering around the heart.

3. How many chambers does the human heart have?

(A) Two
(B) Three
(C) Four
(D) Five

Correct Answer: C

Explanation: Four — this correctly answers the question.

4. Which chamber of the heart has the thickest wall?

(A) Right atrium
(B) Left atrium
(C) Right ventricle
(D) Left ventricle

Correct Answer: D

Explanation: The left ventricle has to pump blood around the whole body, so it has the thickest wall.

5. The valve between the right atrium and right ventricle is the:

(A) Tricuspid valve
(B) Bicuspid valve
(C) Aortic semilunar valve
(D) Pulmonary semilunar valve

Correct Answer: A

Explanation: The atrioventricular valve between the right atrium and the right ventricle has three cusps and is called the tricuspid valve.

6. The systemic circulation carries blood:

(A) From the heart to the lungs
(B) From the heart to the body tissues

(C) From the lungs to the heart
(D) From the body tissues to the lungs

Correct Answer: B

Explanation: Systemic circulation carries oxygenated blood from the left ventricle to the body tissues and returns deoxygenated blood to the right atrium.

7. The pacemaker of the heart is the:

(A) AV node
(B) Bundle of His
(C) SA node
(D) Purkinje fibers

Correct Answer: C

Explanation: The SA node is called the pacemaker of the heart because it initiates the heartbeat.

8. The normal cardiac cycle lasts about:

(A) 0.3 to 0.4 seconds
(B) 1.0 to 1.2 seconds
(C) 1.5 to 2.0 seconds
(D) 0.7 to 0.8 seconds

Correct Answer: D

Explanation: The normal cardiac cycle is of 0.7 to 0.8 second depending on the capability of cardiac muscle to contract.

9. The P wave of an ECG represents:

(A) Atrial depolarization
(B) Ventricular depolarization
(C) Ventricular repolarization
(D) Atrial repolarization

Correct Answer: A

Explanation: The P wave of an ECG represents Atrial depolarization.

10. Which blood vessels carry blood away from the heart?

(A) Veins
(B) Arteries
(C) Capillaries
(D) Venules

Correct Answer: B

Explanation: Arteries carry blood away from the heart.

11. The smallest blood vessels are:

(A) Arteries
(B) Veins
(C) Capillaries
(D) Arterioles

Correct Answer: C

Explanation: Capillaries are the smallest blood vessels, ranging from 7 to 9 μm in diameter.

12. The normal blood pressure is:

(A) 100/60 mmHg
(B) 140/90 mmHg
(C) 160/100 mmHg
(D) 120/80 mmHg

Correct Answer: D

Explanation: 120/80 mmHg is normal blood pressure.

13. Hypertension is defined as blood pressure higher than:

(A) 140/90 mmHg
(B) 120/80 mmHg
(C) 130/85 mmHg
(D) 150/95 mmHg

Correct Answer: A

Explanation: Hypertension is defined as blood pressure higher than 140/90 mmHg.

14. The fluid that enters the lymphatic capillaries is called:

(A) Plasma
(B) Lymph
(C) Interstitial fluid
(D) Cerebrospinal fluid

Correct Answer: B

Explanation: The tissue fluid that has entered the lymphatic capillaries is called lymph.

15. The largest gland in the body is the:

(A) Pancreas
(B) Thyroid
(C) Liver
(D) Salivary gland

Correct Answer: C

Explanation: The liver is the largest gland in the body.

16. What is the function of the chordae tendineae?

(A) To open the semilunar valves
(B) To close the semilunar valves
(C) To generate action potentials
(D) To prevent AV valves from opening into the atria

Correct Answer: D

Explanation: The papillary muscles contract when the ventricles contract and prevent the valves from opening into the atria by pulling on the chordae tendineae attached to the valve cusps.

17. During ventricular systole, which valves are open?

(A) Semilunar valves
(B) Tricuspid and bicuspid valves
(C) Both AV and semilunar valves
(D) Neither AV nor semilunar valves

Correct Answer: A

Explanation: Semilunar valves — this correctly answers the question.

18. What causes the first heart sound ("lub")?

(A) Closure of semilunar valves
(B) Closure of atrioventricular valves
(C) Opening of atrioventricular valves
(D) Opening of semilunar valves

Correct Answer: B

Explanation: The first heart sound is caused by vibration of the atrioventricular valves which close near the beginning of ventricular systole.

19. What is the function of the AV node?

(A) To initiate the heartbeat
(B) To conduct impulses to the ventricles
(C) To relay the impulse and delay it
(D) To produce action potentials at a faster rate

Correct Answer: C

Explanation: The AV node receives the impulse from the SA node and delays it by 0.11 seconds, allowing the atria to contract before the ventricles.

20. What is the significance of the delay in the AV node?

(A) It allows the ventricles to contract before the atria
(B) It prevents the SA node from firing
(C) It speeds up the heart rate
(D) It allows the atria to contract before the ventricles

Correct Answer: D

Explanation: It allows the atria to contract before the ventricles — this correctly answers the question.

21. What does the QRS complex of an ECG represent?

(A) Ventricular depolarization
(B) Atrial depolarization
(C) Ventricular repolarization
(D) Atrial repolarization

Correct Answer: A

Explanation: Ventricular depolarization — this correctly answers the question.

22. What is the normal duration of the P-R interval?

(A) 0.04–0.08 sec
(B) 0.12–0.20 sec
(C) 0.4–0.43 sec
(D) 0.6–1.0 sec

Correct Answer: B

Explanation: The normal P-R interval is 0.12–0.20 sec.

23. Which layer of the artery contains smooth muscle?

(A) Tunica adventitia
(B) Tunica intima
(C) Tunica media
(D) Endothelium

Correct Answer: C

Explanation: The tunica media is the middle layer and contains a variable amount of elastic fibers and circular smooth muscle cells.

24. What is the function of valves in veins?

(A) To increase blood pressure
(B) To filter blood
(C) To produce blood cells
(D) To prevent backflow of blood

Correct Answer: D

Explanation: Veins having diameters greater than 2 mm contain valves that allow blood flow toward the heart but not in the opposite direction.

25. Vasoconstriction is caused by:

(A) Contraction of smooth muscle
(B) Relaxation of smooth muscle
(C) Dilation of blood vessels
(D) Increased blood flow

Correct Answer: A

Explanation: Vasoconstriction is a decrease in blood vessel diameter caused by smooth muscle contraction.

B. Less Important / Secondary Topics

26. Which hormone is a powerful vasoconstrictor?

(A) Norepinephrine
(B) Histamine
(C) Acetylcholine
(D) Insulin

Correct Answer: A

Explanation: Norepinephrine is an especially powerful vasoconstriction hormone.

27. What is the function of pre-capillary sphincters?

(A) To produce blood cells
(B) To regulate blood flow into capillaries
(C) To filter blood
(D) To increase heart rate

Correct Answer: B

Explanation: Pre-capillary sphincters can open and close the entrance to the capillary, regulating blood flow into the capillary bed.

28. Why does blood flow slow down in capillaries?

(A) Because capillaries are narrow
(B) Because blood pressure is highest
(C) Because the total cross-sectional area is largest
(D) Because capillaries have valves

Correct Answer: C

Explanation: Because the total cross-sectional area is largest — this correctly answers the question.

29. The sinoatrial (SA) node is located in the:

(A) Lower wall of the right atrium
(B) Upper wall of the left atrium
(C) Interventricular septum
(D) Upper wall of the right atrium

Correct Answer: D

Explanation: The sinoatrial (SA) node is located in the Upper wall of the right atrium.

30. What is the function of baroreceptors?

(A) To detect changes in blood pressure
(B) To detect changes in blood volume
(C) To detect changes in oxygen levels
(D) To detect changes in temperature

Correct Answer: A

Explanation: Baroreceptors are mechanoreceptors located in the walls of the aorta and carotid sinus that sense blood pressure and relay information to the brain.

31. What is the function of volume receptors?

(A) To detect changes in blood pressure
(B) To detect changes in blood volume
(C) To detect changes in oxygen levels
(D) To detect changes in temperature

Correct Answer: B

Explanation: Volume receptors (low-pressure baroreceptors) are found in the atria and detect changes in blood volume.

32. What is the role of antidiuretic hormone (ADH) in blood pressure regulation?

(A) It increases heart rate
(B) It causes vasodilation
(C) It causes water retention
(D) It decreases blood volume

Correct Answer: C

Explanation: ADH causes water retention in the kidney, which increases blood volume and blood pressure.

33. What is the function of the coronary circulation?

(A) To supply blood to the lungs
(B) To supply blood to the kidneys
(C) To supply blood to the brain
(D) To supply blood to the heart muscle

Correct Answer: D

Explanation: The myocardium is supplied with blood by the right and left coronary arteries.

34. What is the hepatic portal system?

(A) A system that carries blood from the digestive organs to the liver
(B) A system that carries blood from the heart to the liver
(C) A system that carries blood from the liver to the heart
(D) A system that carries blood from the lungs to the liver

Correct Answer: A

Explanation: The hepatic portal system begins with capillaries in the viscera and ends with the capillaries in the liver.

35. What is the function of the lymphatic system?

(A) To carry oxygen to tissues
(B) To return excess interstitial fluid to the blood
(C) To produce red blood cells
(D) To digest food

Correct Answer: B

Explanation: To return excess interstitial fluid to the blood — this correctly answers the question.

36. A patient has a blockage in the left coronary artery. Which of the following is the most likely consequence?

(A) Decreased blood flow to the lungs
(B) Decreased blood flow to the brain
(C) Decreased blood flow to the heart muscle
(D) Decreased blood flow to the kidneys

Correct Answer: C

Explanation: Decreased blood flow to the heart muscle — this correctly answers the question.

37. A patient has damage to the SA node. Which of the following would be the most likely result?

(A) The heart would stop beating
(B) The heart rate would increase
(C) Blood pressure would increase
(D) The AV node would take over as pacemaker

Correct Answer: D

Explanation: If the SA node fails, the AV node can take over as pacemaker, but at a slower rate.

38. A patient has a prolonged P-R interval on an ECG. This indicates a problem with:

(A) Conduction from atria to ventricles
(B) Atrial depolarization
(C) Ventricular depolarization
(D) Ventricular repolarization

Correct Answer: A

Explanation: The P-R interval represents the time from the start of the P wave to the beginning of the QRS complex, indicating the time required for SA depolarization to reach the ventricles.

39. A patient has a condition that causes widespread vasodilation. Which of the following would be the most likely effect on blood pressure?

(A) Increased blood pressure

(B) Decreased blood pressure
(C) No change in blood pressure
(D) Increased heart rate

Correct Answer: B

Explanation: Vasodilation increases blood vessel diameter, which decreases peripheral resistance and lowers blood pressure.

40. Which of the following would occur if the lymphatic vessels were blocked?

(A) Increased blood volume
(B) Increased heart rate
(C) Accumulation of interstitial fluid (edema)
(D) Increased blood pressure

Correct Answer: C

Explanation: If lymphatic vessels are blocked, excess interstitial fluid cannot be returned to the blood, leading to edema.

41. A patient has a deficiency of vitamin K. Which of the following would be most affected?

(A) Oxygen transport
(B) Glucose absorption
(C) Fat digestion
(D) Blood clotting

Correct Answer: D

Explanation: Vitamin K is essential for blood clotting; deficiency can lead to bleeding problems.

42. Which of the following correctly describes the flow of blood through the heart?

(A) Right atrium → tricuspid valve → right ventricle → pulmonary semilunar valve → pulmonary trunk
(B) Right atrium → bicuspid valve → right ventricle → aortic semilunar valve → aorta
(C) Left atrium → tricuspid valve → left ventricle → pulmonary semilunar valve → pulmonary trunk
(D) Left atrium → bicuspid valve → right ventricle → aortic semilunar valve → aorta

Correct Answer: A

Explanation: Deoxygenated blood from the body enters the right atrium, passes through the tricuspid valve to the right ventricle, then through the pulmonary semilunar valve to the pulmonary trunk.

43. A patient with a failing left ventricle would most likely develop:

(A) Pulmonary edema
(B) Systemic edema
(C) Increased blood pressure
(D) Increased cardiac output

Correct Answer: B

Explanation: A patient with a failing left ventricle would most likely develop Systemic edema.

44. Which of the following is the correct order of the cardiac cycle phases?

(A) Atrial systole → atrial diastole → ventricular systole → ventricular diastole
(B) Ventricular systole → ventricular diastole → atrial systole → atrial diastole
(C) Atrial diastole → atrial systole → ventricular systole → ventricular diastole
(D) Atrial diastole → ventricular systole → atrial systole → ventricular diastole

Correct Answer: C

Explanation: Atrial diastole → atrial systole → ventricular systole → ventricular diastole — this correctly answers the question.

45. Which of the following would increase cardiac output?

(A) Decreased heart rate
(B) Decreased stroke volume
(C) Increased peripheral resistance
(D) Increased heart rate and stroke volume

Correct Answer: D

Explanation: Cardiac output is determined by heart rate and stroke volume; increasing both would increase cardiac output.

46. A patient has a condition that causes excessive production of red blood cells. This would most likely:

(A) Increase blood viscosity
(B) Decrease blood viscosity
(C) Decrease blood pressure
(D) Decrease peripheral resistance

Correct Answer: A

Explanation: Increased red blood cells increase blood viscosity, which can increase blood pressure and resistance to flow.

47. Which of the following is the correct pathway of blood through the pulmonary circulation?

(A) Left ventricle → pulmonary trunk → pulmonary arteries → lungs → pulmonary veins → right atrium
(B) Right ventricle → pulmonary trunk → pulmonary arteries → lungs → pulmonary veins → left atrium
(C) Right atrium → pulmonary trunk → pulmonary arteries → lungs → pulmonary veins → left ventricle
(D) Left atrium → pulmonary trunk → pulmonary arteries → lungs → pulmonary veins → right ventricle

Correct Answer: B

Explanation: The pulmonary circuit carries deoxygenated blood from the right ventricle to the lungs and returns oxygenated blood to the left atrium.

48. A patient with a weak lower esophageal sphincter would most likely experience:

(A) Rapid gastric emptying
(B) Increased bile production
(C) Acid reflux into the esophagus
(D) Decreased pancreatic secretion

Correct Answer: C

Explanation: The lower esophageal sphincter normally prevents stomach acid from entering the esophagus; if weak, acid reflux occurs.

49. Which of the following correctly describes the role of the papillary muscles?

(A) They open the semilunar valves
(B) They close the semilunar valves
(C) They generate action potentials
(D) They prevent AV valves from opening into the atria

Correct Answer: D

Explanation: The papillary muscles contract when the ventricles contract and prevent the valves from opening into the atria by pulling on the chordae tendineae.

50. A patient has a blocked hepatic portal vein. Which of the following would be most affected?

(A) Blood flow from the digestive organs to the liver
(B) Blood flow from the heart to the liver
(C) Blood flow from the liver to the heart
(D) Blood flow from the lungs to the heart

Correct Answer: A

Explanation: The hepatic portal vein carries blood from the digestive organs to the liver; blockage would impair this flow.

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Biology Grade 12 — Chapter 3

Respiratory System of Man

by Public Library

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

A. Important / Main Topics

1. The area where gaseous exchange with the environment actually takes place is called the:

(A) Respiratory surface
(B) Respiratory tract
(C) Alveolar duct
(D) Bronchus

Correct Answer: A

Explanation: The area where gaseous exchange with the environment actually takes place is called the respiratory surface.

2. The human respiratory system is divided into:

(A) Central and peripheral tracts
(B) Upper and lower respiratory tracts
(C) Thoracic and abdominal tracts
(D) Internal and external tracts

Correct Answer: B

Explanation: The human respiratory system can be divided into two regions: the upper respiratory tract and the lower respiratory tract.

3. The upper respiratory tract includes:

(A) Larynx, trachea, and bronchi
(B) Trachea, bronchi, and lungs
(C) Nostrils, nasal cavity, and pharynx
(D) Alveoli and bronchioles

Correct Answer: C

Explanation: The upper respiratory tract includes Nostrils, nasal cavity, and pharynx.

4. The opening of the larynx is called the:

(A) Epiglottis
(B) Pharynx
(C) Trachea
(D) Glottis

Correct Answer: D

Explanation: The opening of the larynx is called the glottis.

5. The trachea is reinforced with:

(A) 15–20 C-shaped pieces of cartilage
(B) Complete rings of cartilage
(C) No cartilage
(D) Bone

Correct Answer: A

Explanation: The trachea consists of dense regular tissue and smooth muscle reinforced with 15–20 C-shaped pieces of cartilage.

6. The site of gas exchange in the lungs is the:

(A) Bronchi
(B) Alveoli

(C) Bronchioles
(D) Trachea

Correct Answer: B

Explanation: The alveolar ducts end at tiny air-filled chambers called alveoli, which are the sites of gas exchange between the air and the blood.

7. How many alveoli are present in the lungs?

(A) Over 700 thousand
(B) Over 7 million
(C) Over 700 million
(D) Over 70 million

Correct Answer: C

Explanation: There are over 700 million alveoli present in the lungs.

8. The wall of each alveolus is only:

(A) 1.0 µm thick
(B) 0.01 µm thick
(C) 10 µm thick
(D) 0.1 µm thick

Correct Answer: D

Explanation: The wall of each alveolus is only 0.1 µm thick, reducing the distance over which diffusion must occur.

9. During inspiration, the diaphragm:

(A) Contracts and moves downward
(B) Relaxes and moves upward
(C) Relaxes and moves downward
(D) Contracts and moves upward

Correct Answer: A

Explanation: During inspiration, the diaphragm Contracts and moves downward.

10. Approximately what percentage of oxygen is carried by red blood cells as oxyhaemoglobin?

(A) 3%
(B) 97%
(C) 23%
(D) 70%

Correct Answer: B

Explanation: Approximately 97% of oxygen is carried by the red blood cells as oxyhaemoglobin, while 3% is transported as dissolved oxygen in the plasma.

11. The enzyme that catalyzes the reaction between carbon dioxide and water is:

(A) Acetylcholinesterase
(B) Monoamine oxidase
(C) Carbonic anhydrase
(D) Catalase

Correct Answer: C

Explanation: Carbon dioxide combines with water to form carbonic acid in the presence of enzyme carbonic anhydrase.

12. Most carbon dioxide is transported in the blood as:

(A) Carbaminohaemoglobin
(B) Dissolved in plasma
(C) Carbonic acid
(D) Bicarbonate ions

Correct Answer: D

Explanation: Approximately 70% of carbon dioxide is carried in the blood as bicarbonate ions.

13. Which respiratory pigment is found in muscles?

(A) Myoglobin
(B) Haemoglobin
(C) Chlorophyll
(D) Melanin

Correct Answer: A

Explanation: Myoglobin is found in skeletal muscles and stores oxygen.

14. The maximum oxygen carrying capacity of arterial blood is:

(A) 5 ml/100 ml of blood
(B) 20 ml/100 ml of blood
(C) 10 ml/100 ml of blood
(D) 30 ml/100 ml of blood

Correct Answer: B

Explanation: Maximum oxygen carrying capacity of arterial blood is 20 ml/100 ml of blood (100% saturated).

15. The chloride shift is also called:

(A) Bohr effect
(B) Haldane effect
(C) Hamburger's phenomenon
(D) Starling's law

Correct Answer: C

Explanation: The exchange of bicarbonate ions out of the red blood cell and chloride ions into the red blood cell is called the chloride shift or Hamburger's phenomenon.

16. What is the function of the epiglottis?

(A) To produce sound
(B) To warm the air
(C) To filter dust particles
(D) To prevent food from entering the air passages

Correct Answer: D

Explanation: During swallowing, the epiglottis partially covers the opening into the larynx and helps to prevent foods and liquids from entering the air passages.

17. What is the function of surfactant in the alveoli?

(A) To lower surface tension and prevent alveoli from closing
(B) To increase surface tension
(C) To produce mucus
(D) To filter blood

Correct Answer: A

Explanation: Surfactant is a film of lipoprotein that lowers the surface tension and prevents alveoli from closing.

18. Which muscles are responsible for expanding the thoracic cavity during inspiration?

(A) Internal intercostals and abdominal muscles
(B) Diaphragm and external intercostals
(C) Diaphragm and internal intercostals
(D) Abdominal muscles and external intercostals

Correct Answer: B

Explanation: Diaphragm and external intercostals — this correctly answers the question.

19. What is the role of the breathing center in the medulla?

(A) To control heart rate
(B) To produce sound
(C) To carry out involuntary control of breathing
(D) To filter air

Correct Answer: C

Explanation: To carry out involuntary control of breathing — this correctly answers the question.

20. What is the function of the inspiratory center?

(A) To inhibit inspiration
(B) To stimulate expiration
(C) To control heart rate
(D) To increase the rate and depth of inspiration

Correct Answer: D

Explanation: The ventral portion of the breathing center acts to increase the rate and depth of inspiration and is called the inspiratory center.

21. What is the function of the expiratory center?

(A) To inhibit inspiration and stimulate expiration
(B) To increase inspiration
(C) To control heart rate
(D) To produce sound

Correct Answer: A

Explanation: To inhibit inspiration and stimulate expiration — this correctly answers the question.

22. What is the function of haemoglobin?

(A) To store oxygen in muscles
(B) To transport oxygen in the blood
(C) To produce carbon dioxide
(D) To digest food

Correct Answer: B

Explanation: Haemoglobin is the respiratory pigment found in red blood cells that transports oxygen from the lungs to the tissues.

23. What is the function of myoglobin?

(A) To transport oxygen in the blood
(B) To produce carbon dioxide
(C) To store oxygen in muscles
(D) To digest food

Correct Answer: C

Explanation: Myoglobin is found in skeletal muscles and serves as an intermediate compound for the transfer of oxygen from haemoglobin to aerobic metabolic processes of the muscle cells.

24. What is the Bohr effect?

(A) Increased oxygen binding at high pH
(B) Increased carbon dioxide transport at high pH
(C) Decreased carbon dioxide transport at low pH
(D) Decreased oxygen affinity at low pH

Correct Answer: D

Explanation: The Bohr effect describes how decreased pH reduces the affinity of haemoglobin for oxygen, enhancing oxygen delivery to tissues.

25. What is the function of the vestibular hairs in the nasal cavity?

(A) To filter large dust particles
(B) To produce mucus
(C) To warm the air
(D) To detect odors

Correct Answer: A

Explanation: The anterior part of nasal cavities that contain hairs is called vestibule, and these hairs filter the large dust particles of the inhaled air.

B. Less Important / Secondary Topics

26. What is the function of the ciliated mucous epithelium in the respiratory tract?

(A) To trap fine dust particles and microbes
(B) To produce sound
(C) To produce red blood cells
(D) To digest food

Correct Answer: A

Explanation: To trap fine dust particles and microbes — this correctly answers the question.

27. What is the function of the tonsils?

(A) To produce sound
(B) To protect against infection
(C) To filter blood
(D) To produce red blood cells

Correct Answer: B

Explanation: Tonsils are lymphoid tissue located in the throat that help protect against infection.

28. What is the function of the thymus?

(A) To produce red blood cells
(B) To filter blood
(C) To produce T lymphocytes
(D) To produce sound

Correct Answer: C

Explanation: The thymus is a lymphoid organ that produces T lymphocytes.

29. What is the function of the chloride shift?

(A) To increase oxygen transport
(B) To decrease carbon dioxide transport
(C) To produce bicarbonate
(D) To maintain electrical neutrality

Correct Answer: D

Explanation: To maintain electrical neutrality — this correctly answers the question.

30. What is the function of carbonic anhydrase?

(A) To catalyze the reaction between CO□ and water
(B) To transport oxygen
(C) To produce ATP
(D) To digest proteins

Correct Answer: A

Explanation: To catalyze the reaction between CO□ and water — this correctly answers the question.

31. What is the function of the pleural fluid?

(A) To increase friction
(B) To lubricate the pleural membranes
(C) To produce red blood cells
(D) To digest food

Correct Answer: B

Explanation: To lubricate the pleural membranes — this correctly answers the question.

32. What is the function of the diaphragm?

(A) To produce sound
(B) To filter air
(C) To separate the thoracic cavity from the abdominal cavity
(D) To produce red blood cells

Correct Answer: C

Explanation: The diaphragm is a large dome of skeletal muscle that separates the thoracic cavity from the abdominal cavity.

33. What is the function of the intercostal muscles?

(A) To produce sound
(B) To filter air
(C) To produce red blood cells
(D) To move the rib cage during breathing

Correct Answer: D

Explanation: To move the rib cage during breathing — this correctly answers the question.

34. What is the function of the trachea?

(A) To conduct air to the bronchi
(B) To produce sound
(C) To filter blood
(D) To produce red blood cells

Correct Answer: A

Explanation: The trachea is a membranous tube that conducts air to the bronchi.

35. What is the function of the bronchi?

(A) To produce sound
(B) To conduct air to the lungs
(C) To filter blood
(D) To produce red blood cells

Correct Answer: B

Explanation: To conduct air to the lungs — this correctly answers the question.

36. A patient has a condition that reduces the surface area of the alveoli. Which of the following would be the most likely consequence?

(A) Increased gas exchange
(B) Increased oxygen production
(C) Decreased gas exchange
(D) Increased carbon dioxide production

Correct Answer: C

Explanation: The alveolar surface area is essential for gas exchange; reducing it would decrease the efficiency of gas exchange.

37. A patient has a thickened alveolar wall. Which of the following would be most affected?

(A) Carbon dioxide production
(B) Red blood cell production
(C) Heart rate
(D) Oxygen diffusion

Correct Answer: D

Explanation: Oxygen diffusion — this correctly answers the question.

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

(A) Decreased blood flow to the lungs
(B) Increased blood flow to the lungs
(C) Increased oxygen levels in the blood
(D) Decreased carbon dioxide levels in the blood

Correct Answer: A

Explanation: The pulmonary artery carries deoxygenated blood from the right ventricle to the lungs; blockage would decrease blood flow to the lungs.

39. Which of the following would increase the rate of oxygen diffusion across the alveolar membrane?

(A) Increased membrane thickness
(B) Increased concentration gradient
(C) Decreased surface area
(D) Decreased blood supply

Correct Answer: B

Explanation: The rate of diffusion is proportional to the concentration gradient; increasing it would increase the rate of oxygen diffusion.

40. A patient has a condition that causes excessive mucus production in the airways. Which of the following would be most affected?

(A) Red blood cell production
(B) Heart rate
(C) Airflow
(D) Digestion

Correct Answer: C

Explanation: Airflow — this correctly answers the question.

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

(A) Alveoli would overinflate
(B) Increased gas exchange
(C) Increased oxygen production
(D) Alveoli would collapse

Correct Answer: D

Explanation: Surfactant lowers surface tension and prevents alveoli from closing; deficiency would cause alveoli to collapse.

42. Which of the following correctly describes the chloride shift?

(A) HCO□□ moves out of RBC; Cl□ moves in
(B) HCO□□ moves into RBC; Cl□ moves out
(C) Na□ moves out of RBC; K□ moves in
(D) O□ moves out of RBC; CO□ moves in

Correct Answer: A

Explanation: HCO□□ moves out of RBC; Cl□ moves in — this correctly answers the question.

43. A patient has a condition that causes increased carbon dioxide in the blood. Which of the following would most likely occur?

(A) Increased oxygen binding to haemoglobin
(B) Decreased oxygen binding to haemoglobin
(C) Increased pH
(D) Decreased respiratory rate

Correct Answer: B

Explanation: Increased carbon dioxide increases H□ concentration (decreased pH), which reduces haemoglobin's affinity for oxygen (Bohr effect).

44. Which of the following would occur if the respiratory surface were dry?

(A) Increased gas exchange
(B) Increased oxygen production
(C) Decreased gas exchange
(D) Increased carbon dioxide production

Correct Answer: C

Explanation: The respiratory surface must be moist so that gases can dissolve before diffusing across; dryness would impair gas exchange.

45. A patient has a tumor in the medulla oblongata. Which of the following would most likely be affected?

(A) Voluntary control of breathing
(B) Oxygen transport
(C) Carbon dioxide transport
(D) Involuntary control of breathing

Correct Answer: D

Explanation: The breathing center is located in the medulla and carries out involuntary control of breathing.

46. Which of the following correctly describes the sequence of structures through which air passes during inhalation?

(A) Nasal cavity → pharynx → larynx → trachea → bronchi → bronchioles → alveoli
(B) Nasal cavity → larynx → pharynx → trachea → bronchi → bronchioles → alveoli
(C) Nasal cavity → pharynx → trachea → larynx → bronchi → bronchioles → alveoli
(D) Nasal cavity → pharynx → larynx → bronchi → trachea → bronchioles → alveoli

Correct Answer: A

Explanation: Air passes from the nasal cavity to the pharynx, larynx, trachea, bronchi, bronchioles, and finally alveoli.

47. Which of the following would increase the oxygen carrying capacity of blood?

(A) Decreased haemoglobin
(B) Increased haemoglobin
(C) Decreased red blood cells
(D) Decreased PO□

Correct Answer: B

Explanation: The oxygen carrying capacity of blood is directly proportional to the amount of haemoglobin.

48. A patient has a condition that causes increased carbon monoxide in the blood. Which of the following would be most affected?

(A) Carbon dioxide transport
(B) Red blood cell production
(C) Oxygen transport
(D) Heart rate

Correct Answer: C

Explanation: Carbon monoxide binds to haemoglobin with 249 times greater affinity than oxygen, preventing oxygen uptake.

49. Which of the following correctly describes the role of the pulmonary surfactant?

(A) It increases surface tension
(B) It produces mucus
(C) It filters blood
(D) It lowers surface tension and prevents alveolar collapse

Correct Answer: D

Explanation: Surfactant is a film of lipoprotein that lowers surface tension and prevents alveoli from closing.

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

(A) Decreased oxygen binding to haemoglobin
(B) Increased oxygen binding to haemoglobin
(C) Increased carbon dioxide transport
(D) Decreased respiratory rate

Correct Answer: A

Explanation: Decreased blood pH reduces haemoglobin's affinity for oxygen (Bohr effect), enhancing oxygen release to tissues.

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Biology Grade 12 — Chapter 4

Urinary System of Man

by Public Library

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.

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Biology Grade 12 — Chapter 5

Nervous System of Man

by Public Library

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

A. Important / Main Topics

1. A cell that responds to a stimulus is called a:

(A) Receptor cell
(B) Effector
(C) Neuron
(D) Synapse

Correct Answer: A

Explanation: A cell that responds to a stimulus is called a receptor cell.

2. Receptors are:

(A) Effectors
(B) Transducers
(C) Synapses
(D) Neurotransmitters

Correct Answer: B

Explanation: Receptor cells are transducers; they convert energy from one form such as light, heat or sound into energy in an electrical impulse.

3. The basic structural and functional unit of the nervous system is the:

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

Correct Answer: C

Explanation: Neurons are the basic structural and functional unit of the nervous system.

4. The cell body of a neuron contains:

(A) Only a nucleus
(B) Only mitochondria
(C) Only ribosomes
(D) A nucleus and organelles

Correct Answer: D

Explanation: The cell body of a neuron contains A nucleus and organelles.

5. The short, branched extensions of a neuron that receive stimuli are called:

(A) Dendrites
(B) Axons
(C) Synapses
(D) Terminals

Correct Answer: A

Explanation: Dendrites are short and thin, often highly branched cytoplasmic extensions that receive stimuli.

6. The long, thick nerve fibre that conducts impulses away from the cell body is the:

(A) Dendrite
(B) Axon
(C) Synapse
(D) Ganglion

Correct Answer: B

Explanation: An axon is comparatively a long and thick nerve fibre which conducts action potentials away from the cell body.

7. Which type of neuron carries sensory information to the central nervous system?

(A) Motor neuron
(B) Interneuron
(C) Sensory neuron
(D) Effector neuron

Correct Answer: C

Explanation: Sensory neurons convert signals received from the environment into corresponding stimuli and carry sensory information to the brain and spinal cord.

8. Which type of neuron transmits information from the brain to the effector?

(A) Sensory neuron
(B) Interneuron
(C) Receptor neuron
(D) Motor neuron

Correct Answer: D

Explanation: Motor neurons transmit information from the brain to the effector (muscles or gland) of the body.

9. The two examples of effectors are:

(A) Muscles and glands
(B) Neurons and synapses
(C) Receptors and transducers
(D) Axons and dendrites

Correct Answer: A

Explanation: The two examples of effectors are muscles and glands.

10. The immediate, automatic, and involuntary response to a stimulus is called:

(A) Synaptic transmission
(B) Reflex action
(C) Nerve impulse
(D) Depolarization

Correct Answer: B

Explanation: Reflex action is an immediate, automatic and involuntary response to external and internal environmental changes.

11. A typical reflex arc includes how many fundamental parts?

(A) Three
(B) Four
(C) Five
(D) Six

Correct Answer: C

Explanation: Five — this correctly answers the question.

12. The resting membrane potential is:

(A) +50 mV
(B) 0 mV
(C) +70 mV
(D) −70 mV

Correct Answer: D

Explanation: The resting membrane potential is expressed as −70 mV.

13. The active membrane potential is:

(A) +50 mV

(B) −70 mV
(C) 0 mV
(D) −50 mV

Correct Answer: A

Explanation: During depolarization, the membrane potential changes from −70 mV to +50 mV.

14. The junction between two neurons is called a:

(A) Node of Ranvier
(B) Synapse
(C) Ganglion
(D) Tract

Correct Answer: B

Explanation: The junction between axon terminal of one neuron and the dendrite of another neuron is called a synapse.

15. Which neurotransmitter is excitatory in the peripheral nervous system?

(A) GABA
(B) Glycine
(C) Acetylcholine
(D) Dopamine

Correct Answer: C

Explanation: Acetylcholine is an excitatory neurotransmitter of peripheral nervous system.

16. What is the function of the myelin sheath?

(A) To slow down nerve impulses
(B) To produce neurotransmitters
(C) To receive stimuli
(D) To insulate the axon and speed up impulse transmission

Correct Answer: D

Explanation: The myelin sheath acts as an insulating sheath and prevents loss of energy, and saltatory conduction speeds up impulse transmission.

17. What is saltatory conduction?

(A) Jumping of action potential from one node of Ranvier to another
(B) Continuous conduction along the axon
(C) Transmission across a synapse
(D) Movement of ions across the membrane

Correct Answer: A

Explanation: Saltatory conduction is the rapid transmission of a nerve impulse along an axon, resulting from the action potential jumping from one node of Ranvier to another.

18. What is the function of the sodium-potassium pump?

(A) To produce neurotransmitters
(B) To maintain resting membrane potential
(C) To receive stimuli
(D) To conduct impulses

Correct Answer: B

Explanation: To maintain resting membrane potential — this correctly answers the question.

19. What happens during depolarization?

(A) Na□ ions rush out of the cell
(B) K□ ions rush into the cell
(C) Na□ ions rush into the cell
(D) Ca²□ ions rush out of the cell

Correct Answer: C

Explanation: Na□ ions rush into the cell — this correctly answers the question.

20. What happens during repolarization?

(A) Na□ ions rush into the cell
(B) Ca^{2}□ ions rush into the cell
(C) Cl□ ions rush into the cell
(D) K□ ions rush out of the cell

Correct Answer: D

Explanation: K□ ions rush out of the cell — this correctly answers the question.

21. What is a threshold stimulus?

(A) A stimulus capable of producing action potential
(B) A stimulus that does not produce any response
(C) A stimulus that blocks action potential
(D) A stimulus that only affects the synapse

Correct Answer: A

Explanation: If a stimulus is capable to produce action potential in neuron, it is called threshold stimulus.

22. What is the function of neurotransmitters?

(A) To insulate the axon
(B) To transmit signals across a synapse
(C) To produce myelin
(D) To maintain resting potential

Correct Answer: B

Explanation: Neurotransmitters are chemical messengers that transmit signals across a synapse from one neuron to another.

23. What is the function of acetylcholinesterase?

(A) To synthesize acetylcholine
(B) To produce dopamine
(C) To break down acetylcholine
(D) To transmit nerve impulses

Correct Answer: C

Explanation: Acetylcholine is hydrolyzed by acetylcholinesterase after it has acted on the postsynaptic membrane.

24. Which part of the brain controls equilibrium and coordination?

(A) Cerebrum
(B) Medulla
(C) Thalamus
(D) Cerebellum

Correct Answer: D

Explanation: Cerebellum — this correctly answers the question.

25. Which part of the brain controls heartbeat, blood pressure, and respiration?

(A) Medulla
(B) Cerebrum
(C) Cerebellum
(D) Thalamus

Correct Answer: A

Explanation: The medulla controls the automatic functions of the body, such as heartbeat, blood pressure, respiration, swallowing etc.

B. Less Important / Secondary Topics

26. Which part of the brain is the largest?

(A) Cerebrum

(B) Cerebellum
(C) Medulla
(D) Pons

Correct Answer: A

Explanation: Cerebrum is the largest part of the human brain.

27. How many pairs of cranial nerves are there?

(A) 10
(B) 12
(C) 31
(D) 8

Correct Answer: B

Explanation: There are twelve cranial nerve pairs.

28. How many pairs of spinal nerves are there?

(A) 12
(B) 8
(C) 31
(D) 5

Correct Answer: C

Explanation: There are 31 pairs of spinal nerves, one on each side of the vertebral column.

29. The somatic nervous system is involved in:

(A) Unconscious activities
(B) Reflex actions only
(C) Hormone secretion
(D) Conscious activities

Correct Answer: D

Explanation: The somatic nervous system consists of cranial and spinal nerve fibres that connect the CNS to the skin and skeletal muscles; it is involved in conscious activities.

30. The autonomic nervous system is concerned with:

(A) Unconscious activities
(B) Conscious activities
(C) Voluntary movements
(D) Sensory perception

Correct Answer: A

Explanation: The autonomic nervous system is concerned with unconscious activities.

31. Which division of the autonomic nervous system prepares the body for fight or flight?

(A) Parasympathetic
(B) Sympathetic
(C) Somatic
(D) Central

Correct Answer: B

Explanation: The sympathetic division controls various autonomic functions during the state of emergency and prepares the body for fight or flight response.

32. Which division of the autonomic nervous system returns the body to normal after danger?

(A) Sympathetic
(B) Somatic
(C) Parasympathetic
(D) Central

Correct Answer: C

Explanation: Parasympathetic — this correctly answers the question.

33. What is the function of olfactory receptors?

(A) Detect light
(B) Detect sound
(C) Detect pressure
(D) Detect chemicals (smell)

Correct Answer: D

Explanation: The smell or olfactory receptors are chemoreceptors, stimulated by chemicals dissolved in liquids.

34. What is the function of taste receptors?

(A) Detect chemicals (taste)
(B) Detect light
(C) Detect sound
(D) Detect pressure

Correct Answer: A

Explanation: Taste receptors are chemoreceptors located in taste buds on the surface of the tongue.

35. Which type of receptors detect pain?

(A) Mechanoreceptors
(B) Nociceptors
(C) Thermoreceptors
(D) Photoreceptors

Correct Answer: B

Explanation: Nociceptors — this correctly answers the question.

36. A patient has a condition that causes demyelination of neurons. Which of the following would be the most likely consequence?

(A) Faster nerve impulse transmission
(B) Increased neurotransmitter release
(C) Slower nerve impulse transmission
(D) Increased synaptic delay

Correct Answer: C

Explanation: Slower nerve impulse transmission — this correctly answers the question.

37. A patient has a blockage of sodium channels in a nerve. Which of the following would be most affected?

(A) Repolarization
(B) Resting potential
(C) Synaptic transmission
(D) Depolarization

Correct Answer: D

Explanation: Depolarization is caused by the influx of Na□ ions through sodium channels; blockage would impair depolarization.

38. A patient has a condition that causes excessive neurotransmitter release at a synapse. Which of the following would most likely occur?

(A) Increased nerve impulse transmission
(B) Decreased nerve impulse transmission
(C) Decreased action potential generation
(D) Increased synaptic delay

Correct Answer: A

Explanation: Increased nerve impulse transmission — this correctly answers the question.

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

(A) Thinking and memory
(B) Balance and coordination

(C) Heart rate and breathing
(D) Vision

Correct Answer: B

Explanation: Balance and coordination — this correctly answers the question.

40. A patient has damage to the medulla oblongata. Which of the following would be most critical?

(A) Loss of vision
(B) Loss of hearing
(C) Loss of breathing and heartbeat control
(D) Loss of memory

Correct Answer: C

Explanation: The medulla controls automatic functions such as heartbeat, blood pressure, respiration, and swallowing.

41. A patient has a condition that affects the parasympathetic division. Which of the following would most likely occur?

(A) Decreased heart rate
(B) Increased blood pressure
(C) Increased breathing rate
(D) Increased heart rate

Correct Answer: D

Explanation: Increased heart rate — this correctly answers the question.

42. A patient has a condition that affects the sympathetic division. Which of the following would most likely occur during an emergency?

(A) Decreased ability to respond to stress
(B) Increased ability to respond to stress
(C) Increased digestion
(D) Decreased heart rate

Correct Answer: A

Explanation: The sympathetic division prepares the body for fight or flight; if affected, the body's ability to respond to stress would decrease.

43. Which of the following correctly describes the pathway of a reflex arc?

(A) Receptor → motor neuron → interneuron → sensory neuron → effector
(B) Receptor → sensory neuron → interneuron → motor neuron → effector
(C) Effector → motor neuron → interneuron → sensory neuron → receptor
(D) Receptor → interneuron → sensory neuron → motor neuron → effector

Correct Answer: B

Explanation: Receptor → sensory neuron → interneuron → motor neuron → effector — this correctly answers the question.

44. A patient has a condition that causes increased potassium leakage from neurons. Which of the following would most likely occur?

(A) Increased resting membrane potential
(B) Increased depolarization
(C) Decreased resting membrane potential
(D) Increased action potential frequency

Correct Answer: C

Explanation: Decreased resting membrane potential — this correctly answers the question.

45. Which of the following correctly describes the role of local circuits in saltatory conduction?

(A) They produce myelin
(B) They break down neurotransmitters
(C) They maintain resting potential
(D) They trigger depolarization of the next node

Correct Answer: D

Explanation: They trigger depolarization of the next node — this correctly answers the question.

46. A patient has a condition that causes increased synaptic delay. Which of the following would most likely occur?

(A) Slower nerve impulse transmission
(B) Faster nerve impulse transmission
(C) Increased neurotransmitter release
(D) Increased action potential frequency

Correct Answer: A

Explanation: Synaptic delay is the time taken for the impulse to cross the synapse; increased delay would slow down nerve impulse transmission.

47. Which of the following correctly describes the effect of a subthreshold stimulus?

(A) It produces an action potential
(B) It does not produce an action potential
(C) It increases the resting potential
(D) It decreases the threshold

Correct Answer: B

Explanation: If a stimulus is not capable to excite or fails to arise any response, it is called subthreshold stimulus.

48. A patient has a condition that affects the hippocampus. Which of the following would most likely be affected?

(A) Balance and coordination
(B) Heart rate
(C) Memory
(D) Vision

Correct Answer: C

Explanation: The hippocampus is important in converting short-term memory into long-term memory.

49. A patient has a condition that affects the amygdala. Which of the following would most likely be affected?

(A) Memory
(B) Heart rate
(C) Vision
(D) Emotions

Correct Answer: D

Explanation: Emotions — this correctly answers the question.

50. Which of the following correctly describes the role of the hypothalamus?

(A) It maintains homeostasis and controls the pituitary gland
(B) It controls balance and coordination
(C) It controls vision
(D) It controls hearing

Correct Answer: A

Explanation: The hypothalamus maintains homeostasis and controls the pituitary gland, serving as a link between the nervous and endocrine systems.

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Biology Grade 12 — Chapter 6

Endocrine System of Man

by Public Library

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

A. Important / Main Topics

1. Hormones are:

(A) Organic chemicals secreted by a cell
(B) Inorganic chemicals
(C) Enzymes
(D) Structural proteins

Correct Answer: A

Explanation: Hormones are organic chemicals secreted by a cell that coordinate different functions in the body by carrying messages through blood.

2. The coordination carried out by hormones is called:

(A) Nervous coordination
(B) Chemical coordination
(C) Synaptic coordination
(D) Reflex coordination

Correct Answer: B

Explanation: The hormonal system is concerned with control of the different metabolic functions of the body; this coordination is called chemical coordination.

3. The pituitary gland is located just below the:

(A) Thalamus
(B) Cerebellum
(C) Hypothalamus
(D) Medulla

Correct Answer: C

Explanation: Pituitary gland is located just below the hypothalamus.

4. The pituitary gland is attached to the hypothalamus by a stalk called the:

(A) Peduncle
(B) Isthmus
(C) Hilum
(D) Infundibulum

Correct Answer: D

Explanation: The pituitary gland is attached to the hypothalamus by a stalk called infundibulum.

5. How many lobes does the pituitary gland have?

(A) Three
(B) One
(C) Two
(D) Four

Correct Answer: A

Explanation: Pituitary gland is divided into three lobes: anterior, posterior, and median.

6. The anterior pituitary is considered the master gland because it:

(A) Is the largest gland
(B) Secretes hormones that regulate other endocrine glands
(C) Is located in the brain

(D) Produces only one hormone

Correct Answer: B

Explanation: The anterior pituitary is considered the master gland because it secretes numerous hormones, many of which regulate the.

7. Growth hormone is secreted by the:

(A) Thyroid gland
(B) Posterior pituitary
(C) Anterior pituitary
(D) Adrenal cortex

Correct Answer: C

Explanation: Growth hormone (GH) or Somatotrophic hormone (STH) is secreted by the anterior pituitary.

8. Deficiency of growth hormone in childhood results in:

(A) Gigantism
(B) Acromegaly
(C) Cretinism
(D) Dwarfism

Correct Answer: D

Explanation: Deficiency of GH results in Dwarfism in which development is much slower and individual has short stature.

9. The thyroid gland produces:

(A) T□, T□, and calcitonin
(B) Insulin and glucagon
(C) Cortisol and aldosterone
(D) Estrogen and progesterone

Correct Answer: A

Explanation: The thyroid gland produces T□, T□, and calcitonin.

10. The parathyroid glands secrete:

(A) Calcitonin
(B) Parathyroid hormone (PTH)
(C) Thyroxine
(D) Insulin

Correct Answer: B

Explanation: The parathormone is the single most important hormone of parathyroid controlling the calcium balance of the blood.

11. Insulin is secreted by:

(A) Alpha cells of islets of Langerhans
(B) Delta cells of islets of Langerhans
(C) Beta cells of islets of Langerhans
(D) Acinar cells of pancreas

Correct Answer: C

Explanation: Insulin is secreted by the Beta (β) cells of the islets of Langerhans.

12. Glucagon is secreted by:

(A) Beta cells of islets of Langerhans
(B) Delta cells of islets of Langerhans
(C) Acinar cells of pancreas
(D) Alpha cells of islets of Langerhans

Correct Answer: D

Explanation: Glucagon is secreted by alpha (α) cells of the islets of Langerhans.

13. The adrenal medulla secretes:

(A) Epinephrine and norepinephrine
(B) Cortisol and aldosterone
(C) Androgens
(D) Insulin

Correct Answer: A

Explanation: Epinephrine (adrenaline) and norepinephrine are produced by the adrenal medulla.

14. The female gonads are the:

(A) Testes
(B) Ovaries
(C) Uterus
(D) Fallopian tubes

Correct Answer: B

Explanation: Female gonads are ovaries while male gonads are testes.

15. The male sex hormone is:

(A) Estrogen
(B) Progesterone
(C) Testosterone
(D) Oxytocin

Correct Answer: C

Explanation: Testes produce sperm and male sex hormones called testosterone.

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

(A) Promotes sodium excretion
(B) Increases heart rate
(C) Promotes growth
(D) Promotes water retention

Correct Answer: D

Explanation: ADH is produced during the state of dehydration, decreased blood volume and low blood pressure; it promotes water retention.

17. What is the function of oxytocin?

(A) Stimulates uterine contractions and milk ejection
(B) Promotes water retention
(C) Promotes growth
(D) Regulates calcium

Correct Answer: A

Explanation: Oxytocin is released during childbirth and in nursing women; it stimulates uterine contractions and promotes milk ejection.

18. What is the function of thyroid stimulating hormone (TSH)?

(A) Stimulates adrenal cortex
(B) Stimulates thyroid gland
(C) Stimulates growth
(D) Stimulates milk production

Correct Answer: B

Explanation: Stimulates thyroid gland — this correctly answers the question.

19. What is the function of adrenocorticotropic hormone (ACTH)?

(A) Stimulates thyroid gland
(B) Stimulates growth
(C) Stimulates adrenal cortex
(D) Stimulates milk production

Correct Answer: C

Explanation: Stimulates adrenal cortex — this correctly answers the question.

20. What is the function of follicle stimulating hormone (FSH)?

(A) Regulates calcium
(B) Regulates metabolism
(C) Regulates water balance
(D) Regulates reproductive system

Correct Answer: D

Explanation: Regulates reproductive system — this correctly answers the question.

21. What is the function of luteinising hormone (LH)?

(A) Regulates reproductive system
(B) Regulates calcium
(C) Regulates metabolism
(D) Regulates water balance

Correct Answer: A

Explanation: Regulates reproductive system — this correctly answers the question.

22. What is the function of prolactin?

(A) Regulates calcium
(B) Regulates reproductive system
(C) Regulates metabolism
(D) Regulates water balance

Correct Answer: B

Explanation: Regulates reproductive system — this correctly answers the question.

23. What is the function of melanocyte stimulating hormone (MSH)?

(A) Stimulates thyroid
(B) Stimulates growth
(C) Stimulates melanin production
(D) Stimulates milk production

Correct Answer: C

Explanation: Stimulates melanin production — this correctly answers the question.

24. What is the function of calcitonin?

(A) Increases blood calcium
(B) Increases blood glucose
(C) Decreases blood glucose
(D) Decreases blood calcium

Correct Answer: D

Explanation: Decreases blood calcium — this correctly answers the question.

25. What is the function of parathyroid hormone (PTH)?

(A) Increases blood calcium
(B) Decreases blood calcium
(C) Increases blood glucose
(D) Decreases blood glucose

Correct Answer: A

Explanation: Increases blood calcium — this correctly answers the question.

B. Less Important / Secondary Topics

26. What is the function of insulin?

(A) Lowers blood glucose
(B) Raises blood glucose
(C) Increases blood calcium

(D) Decreases blood calcium

Correct Answer: A

Explanation: Lowers blood glucose — this correctly answers the question.

27. What is the function of glucagon?

(A) Lowers blood glucose
(B) Raises blood glucose
(C) Increases blood calcium
(D) Decreases blood calcium

Correct Answer: B

Explanation: Raises blood glucose — this correctly answers the question.

28. What is the function of cortisol?

(A) Regulates calcium
(B) Regulates water balance
(C) Regulates blood glucose
(D) Regulates growth

Correct Answer: C

Explanation: Regulates blood glucose — this correctly answers the question.

29. What is the function of aldosterone?

(A) Regulates blood glucose
(B) Regulates calcium
(C) Regulates growth
(D) Regulates salt and water balance

Correct Answer: D

Explanation: Regulates salt and water balance — this correctly answers the question.

30. What is the function of estrogen?

(A) Secondary sex characteristics in females
(B) Male sex characteristics
(C) Regulates calcium
(D) Regulates water balance

Correct Answer: A

Explanation: Estrogen is responsible for secondary sex characteristics in females.

31. What is the function of progesterone?

(A) Male sex characteristics
(B) Maintains pregnancy
(C) Regulates calcium
(D) Regulates water balance

Correct Answer: B

Explanation: Progesterone causes further thickening and vascularisation of the uterus wall for maintaining state of pregnancy.

32. What is the function of testosterone?

(A) Female sex characteristics
(B) Regulates calcium
(C) Male sex characteristics and sperm production
(D) Regulates water balance

Correct Answer: C

Explanation: Male sex characteristics and sperm production — this correctly answers the question.

33. What is the function of the hypothalamus in the endocrine system?

(A) It produces insulin
(B) It produces thyroid hormones

(C) It produces cortisol
(D) It controls the pituitary gland

Correct Answer: D

Explanation: The hypothalamus is the master control centre of the endocrine system; its endocrine signals directly control the pituitary gland.

34. What is a feedback mechanism?

(A) A controlling mechanism controlled by its product
(B) A mechanism that produces hormones
(C) A mechanism that destroys hormones
(D) A mechanism that stores hormones

Correct Answer: A

Explanation: A feedback mechanism is a type of interaction in which a controlling mechanism is itself controlled by the product of reactions it is controlling.

35. What is positive feedback?

(A) An end product slows down its production
(B) An end product speeds up its production
(C) An end product has no effect
(D) An end product destroys the gland

Correct Answer: B

Explanation: An end product speeds up its production — this correctly answers the question.

36. A patient has a tumor in the anterior pituitary that causes excessive GH secretion in adulthood. Which of the following is the most likely consequence?

(A) Gigantism
(B) Dwarfism
(C) Acromegaly
(D) Cretinism

Correct Answer: C

Explanation: Acromegaly — this correctly answers the question.

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

(A) Diabetes mellitus
(B) Gigantism
(C) Acromegaly
(D) Diabetes insipidus

Correct Answer: D

Explanation: Diabetes insipidus — this correctly answers the question.

38. A patient has a deficiency of insulin. Which of the following is the most likely consequence?

(A) Diabetes mellitus
(B) Diabetes insipidus
(C) Gigantism
(D) Acromegaly

Correct Answer: A

Explanation: Diabetes mellitus — this correctly answers the question.

39. A patient has a deficiency of parathyroid hormone. Which of the following is the most likely consequence?

(A) Hypercalcemia
(B) Hypocalcemia and tetany
(C) Hyperglycemia
(D) Hypoglycemia

Correct Answer: B

Explanation: Under secretion of parathormone causes hypocalcemia, which increases the excitability of neurons and can lead to tetany.

40. A patient has an over secretion of parathyroid hormone. Which of the following is the most likely consequence?

(A) Hypocalcemia and tetany
(B) Hyperglycemia
(C) Hypercalcemia and kidney stones
(D) Hypoglycemia

Correct Answer: C

Explanation: Hypercalcemia and kidney stones — this correctly answers the question.

41. A patient has Graves' disease. Which of the following is the most likely cause?

(A) Under secretion of T□ and T□
(B) Over secretion of insulin
(C) Under secretion of insulin
(D) Over secretion of T□ and T□

Correct Answer: D

Explanation: Over secretion of T□ and T□ — this correctly answers the question.

42. A patient has myxedema. Which of the following is the most likely cause?

(A) Under secretion of thyroxin
(B) Over secretion of thyroxin
(C) Over secretion of insulin
(D) Under secretion of insulin

Correct Answer: A

Explanation: In adults, the full-blown hypothyroid syndrome is called myxedema, caused by under secretion of thyroxin.

43. A patient has Cushing's disease. Which of the following is the most likely cause?

(A) Under secretion of cortical hormones
(B) Over secretion of cortical hormones
(C) Over secretion of insulin
(D) Under secretion of insulin

Correct Answer: B

Explanation: Over secretion of cortical hormones — this correctly answers the question.

44. A patient has Addison's disease. Which of the following is the most likely cause?

(A) Over secretion of cortical hormones
(B) Over secretion of insulin
(C) Under secretion of cortical hormones
(D) Under secretion of insulin

Correct Answer: C

Explanation: Under secretion of cortical hormones — this correctly answers the question.

45. Which of the following correctly describes the negative feedback mechanism?

(A) End products amplify the change
(B) End products have no effect
(C) End products destroy the gland
(D) End products reverse the direction of change

Correct Answer: D

Explanation: End products reverse the direction of change — this correctly answers the question.

46. Which of the following correctly describes the positive feedback mechanism?

(A) End products amplify the change
(B) End products reverse the change

(C) End products have no effect
(D) End products destroy the gland

Correct Answer: A

Explanation: End products amplify the change — this correctly answers the question.

47. Which of the following correctly describes the role of oxytocin in positive feedback?

(A) It inhibits uterine contractions
(B) It stimulates uterine contractions
(C) It regulates blood glucose
(D) It regulates calcium

Correct Answer: B

Explanation: Oxytocin stimulates more and stronger uterine contractions, which is an example of positive feedback.

48. Which of the following correctly describes the role of insulin in negative feedback?

(A) It raises blood glucose
(B) It increases blood calcium
(C) It lowers blood glucose
(D) It decreases blood calcium

Correct Answer: C

Explanation: It lowers blood glucose — this correctly answers the question.

49. Which of the following correctly describes the role of glucagon in negative feedback?

(A) It lowers blood glucose
(B) It increases blood calcium
(C) It decreases blood calcium
(D) It raises blood glucose

Correct Answer: D

Explanation: It raises blood glucose — this correctly answers the question.

50. Which of the following correctly describes the role of the hypothalamus in thermoregulation?

(A) It acts as a thermostat
(B) It produces insulin
(C) It produces thyroid hormones
(D) It produces cortisol

Correct Answer: A

Explanation: The thermoregulatory center in the human body is located in the hypothalamus, which acts as a thermostat.

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Biology Grade 12 — Chapter 7

Support and Movement

by Public Library

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

A. Important / Main Topics

1. The study of bones and cartilage is called:

(A) Osteology
(B) Myology
(C) Arthrology
(D) Neurology

Correct Answer: A

Explanation: The study of bones and cartilage is called osteology.

2. The terminal broad parts of a bone are called the:

(A) Diaphysis
(B) Epiphysis
(C) Periosteum
(D) Endosteum

Correct Answer: B

Explanation: The terminal broad parts are called epiphysis.

3. The middle part along the length of a bone is called the:

(A) Epiphysis
(B) Periosteum
(C) Diaphysis
(D) Endosteum

Correct Answer: C

Explanation: The middle part along the length of bone is called diaphysis or shaft.

4. Bone-forming cells are called:

(A) Osteoclasts
(B) Osteocytes
(C) Chondrocytes
(D) Osteoblasts

Correct Answer: D

Explanation: Osteoblasts are bone forming cells that synthesize and secrete unmineralized ground substance.

5. Bone-destroying cells are called:

(A) Osteoclasts
(B) Osteoblasts
(C) Osteocytes
(D) Chondrocytes

Correct Answer: A

Explanation: Osteoclasts are bone destroying cells that perform bone resorption.

6. The living cells of cartilage are called:

(A) Osteocytes
(B) Chondrocytes
(C) Osteoblasts
(D) Osteoclasts

Correct Answer: B

Explanation: The living cells of cartilage are called chondrocytes.

7. How many bones are there in the human skeleton?

(A) 106
(B) 306
(C) 206
(D) 406

Correct Answer: C

Explanation: 206 — this correctly answers the question.

8. The axial skeleton includes:

(A) Pectoral girdle and pelvic girdle
(B) Forelimbs and hind limbs
(C) Arms and legs
(D) Skull, vertebral column, and rib cage

Correct Answer: D

Explanation: The axial skeleton includes Skull, vertebral column, and rib cage.

9. The appendicular skeleton includes:

(A) Pectoral girdle, pelvic girdle, forelimbs, and hind limbs
(B) Skull and vertebral column
(C) Rib cage and sternum
(D) Cranium and facial bones

Correct Answer: A

Explanation: The appendicular skeleton includes Pectoral girdle, pelvic girdle, forelimbs, and hind limbs.

10. How many vertebrae are in the human vertebral column?

(A) 26
(B) 33
(C) 40
(D) 45

Correct Answer: B

Explanation: 33 — this correctly answers the question.

11. How many pairs of ribs are in the human rib cage?

(A) 10
(B) 14
(C) 12
(D) 16

Correct Answer: C

Explanation: 12 — this correctly answers the question.

12. A joint is a place where:

(A) Muscles attach to bones
(B) Bones are formed
(C) Blood vessels enter bones
(D) Two bones or bone and cartilage come together

Correct Answer: D

Explanation: A joint or articulation is a place where two bones or bone and cartilage come together.

13. The scientific study of joints is called:

(A) Arthrology
(B) Osteology
(C) Myology
(D) Neurology

Correct Answer: A

Explanation: The scientific study of the structure and function of joints is called arthrology.

14. Which type of joint is immoveable?

(A) Cartilaginous joint
(B) Fibrous joint
(C) Synovial joint
(D) Hinge joint

Correct Answer: B

Explanation: Fibrous joints are immoveable joints.

15. Which type of joint is freely moveable?

(A) Fibrous joint
(B) Cartilaginous joint
(C) Synovial joint
(D) Suture

Correct Answer: C

Explanation: Synovial joints are freely moveable joints.

16. What is the function of osteoblasts?

(A) Bone resorption
(B) Cartilage formation
(C) Blood cell production
(D) Bone formation

Correct Answer: D

Explanation: Osteoblasts are bone forming cells that synthesize and secrete unmineralized ground substance.

17. What is the function of osteoclasts?

(A) Bone resorption
(B) Bone formation
(C) Cartilage formation
(D) Blood cell production

Correct Answer: A

Explanation: Bone resorption — this correctly answers the question.

18. What is the function of osteocytes?

(A) Bone formation
(B) Maintain healthy bone tissue
(C) Bone resorption
(D) Blood cell production

Correct Answer: B

Explanation: Maintain healthy bone tissue — this correctly answers the question.

19. What is the function of cartilage?

(A) Produces blood cells
(B) Stores fat
(C) Provides flexible support
(D) Produces hormones

Correct Answer: C

Explanation: Cartilage is more flexible than bone and provides flexible support.

20. Which type of cartilage is found at the ends of long bones?

(A) Fibrocartilage
(B) Elastic cartilage
(C) Calcified cartilage
(D) Hyaline cartilage

Correct Answer: D

Explanation: Hyaline cartilage is found at the ends of long bones.

21. Which type of cartilage is found in the disks between vertebrae?

(A) Fibrocartilage
(B) Hyaline cartilage
(C) Elastic cartilage
(D) Calcified cartilage

Correct Answer: A

Explanation: Fibrocartilage is found in the disks located between the vertebrae.

22. Which type of cartilage is found in the ear flaps?

(A) Hyaline cartilage
(B) Elastic cartilage
(C) Fibrocartilage
(D) Calcified cartilage

Correct Answer: B

Explanation: Elastic cartilage is found in the ear flaps and epiglottis.

23. What is the function of synovial fluid?

(A) To produce blood cells
(B) To store fat
(C) To lubricate the joint
(D) To produce hormones

Correct Answer: C

Explanation: Synovial fluid is secreted by the synovial membrane and lubricates the joint.

24. Which of the following is a hinge joint?

(A) Shoulder
(B) Hip
(C) Neck
(D) Elbow

Correct Answer: D

Explanation: Elbow — this correctly answers the question.

25. Which of the following is a ball-and-socket joint?

(A) Shoulder
(B) Elbow
(C) Knee
(D) Neck

Correct Answer: A

Explanation: Shoulder — this correctly answers the question.

B. Less Important / Secondary Topics

26. What is the function of the vertebral column?

(A) Supports the body and protects the spinal cord
(B) Protects the brain
(C) Produces blood cells
(D) Stores fat

Correct Answer: A

Explanation: Supports the body and protects the spinal cord — this correctly answers the question.

27. What is the function of the rib cage?

(A) Produces blood cells
(B) Protects the heart and lungs
(C) Stores fat

(D) Produces hormones

Correct Answer: B

Explanation: The rib cage provides support for a semi-vacuum chamber called chest cavity and protects the heart and lungs.

28. What is a slipped disc?

(A) Fracture of vertebra
(B) Inflammation of joint
(C) Herniation of intervertebral disc
(D) Curvature of spine

Correct Answer: C

Explanation: Herniation of intervertebral disc — this correctly answers the question.

29. What is spondylosis?

(A) Herniation of disc
(B) Inflammation of joint
(C) Curvature of spine
(D) Immobility and fusion of vertebral joint

Correct Answer: D

Explanation: Spondylosis is the immobility and fusion of vertebral joint.

30. What is sciatica?

(A) Pain in the leg due to pressure on sciatic nerve
(B) Inflammation of joint
(C) Curvature of spine
(D) Bone fracture

Correct Answer: A

Explanation: Sciatica refers to pain, weakness, numbness, or tingling in the leg caused by injury to or pressure on the sciatic nerve.

31. What is arthritis?

(A) Bone fracture
(B) Inflammation of joints
(C) Muscle cramp
(D) Curvature of spine

Correct Answer: B

Explanation: Arthritis is the inflammation of joints.

32. What is osteoporosis?

(A) Inflammation of joints
(B) Muscle cramp
(C) Reduced bone mass and increased risk of fracture
(D) Curvature of spine

Correct Answer: C

Explanation: Osteoporosis is a common disease characterised by reduced bone mass and an increased risk of fracture.

33. What is a simple fracture?

(A) Bone ends penetrate the skin
(B) Fracture damages adjacent organs
(C) Bone is crushed
(D) Skin is intact

Correct Answer: D

Explanation: Simple fracture or closed fractures are those in which the skin is intact.

34. What is a compound fracture?

(A) Bone ends penetrate the skin
(B) Skin is intact
(C) Fracture damages adjacent organs
(D) Bone is crushed

Correct Answer: A

Explanation: If the bone ends penetrate the skin and form a wound are called compound fracture or open fracture.

35. What is the first step in bone repair?

(A) Fibrocartilaginous callus formation
(B) Haematoma formation
(C) Bony callus formation
(D) Bone remodelling

Correct Answer: B

Explanation: The first step in bone repair is haematoma or clot formation.

36. A patient has a condition that causes decreased bone mass. Which of the following is the most likely diagnosis?

(A) Arthritis
(B) Slipped disc
(C) Osteoporosis
(D) Sciatica

Correct Answer: C

Explanation: Osteoporosis is characterized by reduced bone mass and an increased risk of fracture.

37. A patient has a herniated disc pressing on the spinal nerve. Which of the following is the most likely consequence?

(A) Improved nerve function
(B) Increased bone mass
(C) Decreased muscle tone
(D) Severe pain

Correct Answer: D

Explanation: Severe pain — this correctly answers the question.

38. A patient has a condition that causes immobility and fusion of vertebral joint. Which of the following is the most likely diagnosis?

(A) Spondylosis
(B) Sciatica
(C) Arthritis
(D) Osteoporosis

Correct Answer: A

Explanation: Spondylosis is the immobility and fusion of vertebral joint.

39. A patient has a condition that causes inflammation of the synovial membrane due to a faulty immune system. Which of the following is the most likely diagnosis?

(A) Osteoarthritis
(B) Rheumatoid arthritis
(C) Gouty arthritis
(D) Osteoporosis

Correct Answer: B

Explanation: Rheumatoid arthritis is the result of an autoimmune disorder in which synovial membrane becomes inflamed due to faulty immune system.

40. A patient has a condition that causes uric acid crystals to deposit in the joints. Which of the following is the most likely diagnosis?

(A) Osteoarthritis

(B) Rheumatoid arthritis
(C) Gouty arthritis
(D) Osteoporosis

Correct Answer: C

Explanation: Gouty arthritis results from a metabolic disorder in which an abnormal amount of uric acid is retained in the blood and sodium urate crystals are deposited in the joints.

41. A patient has a simple fracture. Which of the following is the correct sequence of bone repair?

(A) Fibrocartilaginous callus → haematoma → bony callus → bone remodelling
(B) Bony callus → haematoma → fibrocartilaginous callus → bone remodelling
(C) Bone remodelling → haematoma → fibrocartilaginous callus → bony callus
(D) Haematoma → fibrocartilaginous callus → bony callus → bone remodelling

Correct Answer: D

Explanation: Haematoma → fibrocartilaginous callus → bony callus → bone remodelling — this correctly answers the question.

42. A patient has a dislocated joint. Which of the following is the most appropriate first aid?

(A) Immobilize the joint
(B) Manipulate the joint
(C) Apply heat
(D) Massage the joint

Correct Answer: A

Explanation: First aid for dislocation includes immobilizing the fractured bone or dislocated joint but do not attempt to manipulate, pull or re-align the injured joint.

43. A patient has a sprain. Which of the following is the most appropriate treatment?

(A) Surgery
(B) Rest, icing, and physical therapy
(C) Manipulation
(D) Heat application

Correct Answer: B

Explanation: Sprains can usually be treated conservatively with treatments such as icing and physical therapy.

44. Which of the following correctly describes the sliding filament model of muscle contraction?

(A) Thick myofilaments slide past thin myofilaments
(B) Myofilaments shorten
(C) Thin myofilaments slide past thick myofilaments
(D) Myofilaments lengthen

Correct Answer: C

Explanation: The sliding filament theory of contraction states that during contraction the thin myofilaments slide past the thick ones so that they overlap to a greater degree.

45. Which of the following correctly describes the role of calcium in muscle contraction?

(A) It binds to myosin and displaces actin
(B) It breaks down acetylcholine
(C) It produces ATP
(D) It binds to troponin and displaces tropomyosin

Correct Answer: D

Explanation: When calcium ions bind with the troponin molecules they cause them to move slightly, displacing the tropomyosin and exposing the binding sites for the myosin head.

46. Which of the following correctly describes the role of ATP in muscle contraction?

(A) It breaks cross bridges
(B) It forms cross bridges
(C) It binds to troponin
(D) It displaces tropomyosin

Correct Answer: A

Explanation: Once the myosin head has become attached to the actin filament, ATP is hydrolysed and the crossed bridges are broken down.

47. Which of the following correctly describes muscle fatigue?

(A) Increased ability to contract
(B) Loss of ability to contract
(C) Muscle lengthening
(D) Muscle relaxation

Correct Answer: B

Explanation: When the muscles lose the ability to contract, the physiological state of muscles is called muscle fatigue.

48. Which of the following correctly describes a cramp?

(A) Loss of ability to contract
(B) Continuous muscle contraction due to calcium imbalance
(C) Tetanic contraction of entire muscle
(D) Muscle lengthening

Correct Answer: C

Explanation: Cramp is also known as tetanic contraction of entire muscle.

49. Which of the following correctly describes tetany?

(A) Tetanic contraction of entire muscle
(B) Loss of ability to contract
(C) Muscle lengthening
(D) Continuous muscle contraction and convulsion due to calcium imbalance

Correct Answer: D

Explanation: In tetany the body shakes from continuous muscle contraction and convulsion occur due to calcium imbalance.

50. Which of the following correctly distinguishes tetany from tetanus?

(A) Tetany is caused by electrolyte imbalance; tetanus is caused by bacterial infection
(B) Tetany is caused by bacterial infection; tetanus is caused by electrolyte imbalance
(C) Both are caused by bacterial infection
(D) Both are caused by electrolyte imbalance

Correct Answer: A

Explanation: Tetany is caused by electrolyte imbalance (e.g., low calcium), while tetanus is caused by bacterial infection (Clostridium tetani).

Biology Grade 12 — Chapter 8

Thermoregulation and Homeostasis

by Public Library

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

A. Important / Main Topics

1. Thermoregulation is the maintenance of internal temperature within a range that allows:

(A) Cells to function efficiently
(B) Cells to stop working
(C) Enzymes to denature
(D) Blood pressure to rise

Correct Answer: A

Explanation: Thermoregulation is defined as the maintenance of internal temperature within a range that allows cells to function efficiently.

2. The core temperature of the human body remains reasonably constant at:

(A) 30°C
(B) 37°C
(C) 40°C
(D) 25°C

Correct Answer: B

Explanation: The core temperature of the human body remains reasonably constant at 37°C.

3. Animals that are unable to maintain their body temperature within narrow limits using physiological mechanisms are called:

(A) Homeotherms
(B) Endotherms
(C) Poikilotherms
(D) Osmoregulators

Correct Answer: C

Explanation: Poikilotherms are unable to maintain their body temperature within the narrow limits using physiological mechanisms.

4. Animals that can maintain a fairly constant body temperature by using physiological mechanisms are called:

(A) Poikilotherms
(B) Ectotherms
(C) Osmoconformers
(D) Homeotherms

Correct Answer: D

Explanation: Homeotherms are birds and mammals which are able to maintain a fairly constant body temperature by using physiological mechanisms.

5. Animals that rely more on heat derived from the environment to raise their body temperature are called:

(A) Ectotherms
(B) Endotherms
(C) Homeotherms
(D) Osmoregulators

Correct Answer: A

Explanation: Ectotherms rely more on heat derived from the environment to raise their body temperature.

6. Animals that produce their own body heat through metabolism are called:

(A) Ectotherms
(B) Endotherms
(C) Poikilotherms
(D) Osmoconformers

Correct Answer: B

Explanation: Endotherms produce their own body heat through heat production as byproduct during metabolism.

7. The thermoregulatory center in the human body is located in the:

(A) Cerebrum
(B) Cerebellum
(C) Hypothalamus
(D) Medulla

Correct Answer: C

Explanation: Thermoregulatory center in human body is located in the hypothalamus which acts as a thermostat.

8. Homeostasis means:

(A) Keeping things out of balance
(B) Increasing body temperature
(C) Decreasing body temperature
(D) Keeping things in balance

Correct Answer: D

Explanation: Homeostasis means keeping things in balance.

9. The process by which organisms keep internal conditions relatively constant is called:

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

Correct Answer: A

Explanation: Homeostasis is the process by which organisms keep internal conditions relatively constant despite changes in external environment.

10. The three components of homeostatic mechanisms are:

(A) Receptor, effector, hormone
(B) Receptor, control center, effector
(C) Control center, hormone, effector
(D) Receptor, control center, hormone

Correct Answer: B

Explanation: The three components of homeostatic mechanisms are Receptor, control center, effector.

11. The maintenance of constant osmotic conditions in the body is called:

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

Correct Answer: C

Explanation: The maintenance of constant osmotic conditions (water and solute concentration) in the body is called osmoregulation.

12. Animals that change the osmotic concentrations of the body fluids according to the surrounding medium are called:

(A) Osmoregulators
(B) Homeotherms
(C) Endotherms

(D) Osmoconformers

Correct Answer: D

Explanation: Those animals that change the osmotic concentrations of the body fluids according to that of surrounding medium are called osmo-conformers.

13. Animals that maintain internal osmotic concentrations different from the surrounding medium are called:

(A) Osmoregulators
(B) Osmoconformers
(C) Poikilotherms
(D) Ectotherms

Correct Answer: A

Explanation: Those animals that can maintain internal osmotic concentrations different from the surrounding medium are called osmoregulators.

14. Freshwater animals are generally:

(A) Hypotonic to their environment
(B) Hypertonic to their environment
(C) Isotonic to their environment
(D) Independent of their environment

Correct Answer: B

Explanation: Almost all of the freshwater animals are osmoregulators and are generally hypertonic to their outer environment.

15. Marine teleosts are:

(A) Hypertonic to their environment
(B) Isotonic to their environment
(C) Hypotonic to their environment
(D) Independent of their environment

Correct Answer: C

Explanation: Most of the marine teleosts (bony fishes) are hypotonic to sea water.

16. What is the function of vasodilation during heat exposure?

(A) Decreases heat loss
(B) Increases heat production
(C) Decreases heat production
(D) Increases heat loss

Correct Answer: D

Explanation: One way to increase heat loss is to supply the capillaries in the skin with a greater volume of blood, which then loses heat to the environment via radiation.

17. What is the function of sweating?

(A) Cools the body
(B) Warms the body
(C) Increases heat production
(D) Decreases heat loss

Correct Answer: A

Explanation: Evaporation of sweat from the skin's surface leads to cooling.

18. What is the function of shivering?

(A) Decreases heat production
(B) Increases heat production
(C) Increases heat loss
(D) Decreases heat loss

Correct Answer: B

Explanation: We shiver when muscles contract and relax rapidly; shivering muscles give out four or five times as much heat as resting muscles.

19. What is the function of vasoconstriction during cold exposure?

(A) Increases heat loss
(B) Increases heat production
(C) Decreases heat loss
(D) Decreases heat production

Correct Answer: C

Explanation: One way to decrease heat loss is to supply the capillaries in the skin with a smaller volume of blood, minimizing the loss of heat to the environment via radiation.

20. What is the function of piloerection?

(A) Increases heat loss
(B) Decreases heat production
(C) Increases sweating
(D) Traps air for insulation

Correct Answer: D

Explanation: In most mammals, piloerection makes the fur 'thicker', so that it traps more air to provide extra insulation.

21. What is the function of increased metabolic rate during cold exposure?

(A) Increases heat production
(B) Decreases heat production
(C) Increases heat loss
(D) Decreases heat loss

Correct Answer: A

Explanation: The body secretes the hormone adrenaline in response to cold; this raises metabolic rate and therefore increases heat production.

22. What is the function of the receptor in homeostatic mechanisms?

(A) Processes information
(B) Receives information about changes
(C) Responds to commands
(D) Produces hormones

Correct Answer: B

Explanation: The receptor receives information that something in the environment is changing.

23. What is the function of the control center in homeostatic mechanisms?

(A) Receives information
(B) Responds to commands
(C) Processes information
(D) Produces hormones

Correct Answer: C

Explanation: The control center receives and processes information from the receptor.

24. What is the function of the effector in homeostatic mechanisms?

(A) Receives information
(B) Processes information
(C) Produces hormones
(D) Responds to commands

Correct Answer: D

Explanation: Responds to commands — this correctly answers the question.

25. What is the function of negative feedback?

(A) Maintains homeostasis

(B) Amplifies change
(C) Increases temperature
(D) Decreases temperature

Correct Answer: A

Explanation: Homeostasis is maintained by negative feedback loops within the organism.

B. Less Important / Secondary Topics

26. What is the function of positive feedback?

(A) Amplifies change
(B) Maintains homeostasis
(C) Reverses change
(D) Decreases temperature

Correct Answer: A

Explanation: Amplifies change — this correctly answers the question.

27. What is the function of osmoregulation in freshwater animals?

(A) Produces small volume of concentrated urine
(B) Produces large volume of diluted urine
(C) Increases salt loss
(D) Decreases water intake

Correct Answer: B

Explanation: Freshwater animals deal with their problems by producing large volume of diluted urine.

28. What is the function of ionocytes in freshwater animals?

(A) Produce urine
(B) Produce hormones
(C) Actively transport salts
(D) Digest food

Correct Answer: C

Explanation: Freshwater animals actively transport salts from the external dilute medium with the help of special salt cells called ionocytes.

29. What is the function of rectal glands in some marine fishes?

(A) Produce urine
(B) Produce hormones
(C) Digest food
(D) Remove salts into the digestive tract

Correct Answer: D

Explanation: Some fishes have special salt secreting glands in the wall of rectum called rectal glands that remove salts into the digestive tract.

30. What is anhydrobiosis?

(A) Ability to tolerate dehydration
(B) Ability to tolerate excess water
(C) Ability to produce hormones
(D) Ability to digest food

Correct Answer: A

Explanation: Desert mammals can tolerate against strong degree of dehydration by special metabolic and behavioural adaptation; this characteristic is called anhydrobiosis.

31. What is the function of the kangaroo rat's metabolic water?

(A) Provides food
(B) Provides water for survival
(C) Provides hormones
(D) Provides oxygen

Correct Answer: B

Explanation: Ninety percent of the water that kangaroo rat uses is metabolic water derived from cellular oxidation.

32. What is the function of the renin-angiotensin system?

(A) Regulates temperature
(B) Regulates digestion
(C) Regulates blood pressure and fluid balance
(D) Regulates reproduction

Correct Answer: C

Explanation: Regulates blood pressure and fluid balance — this correctly answers the question.

33. What is the function of ADH in osmoregulation?

(A) Promotes water loss
(B) Promotes salt loss
(C) Promotes heat loss
(D) Promotes water retention

Correct Answer: D

Explanation: ADH causes water retention in the kidney, which increases blood volume.

34. What is the function of aldosterone in osmoregulation?

(A) Promotes sodium reabsorption
(B) Promotes sodium loss
(C) Promotes water loss
(D) Promotes heat loss

Correct Answer: A

Explanation: Promotes sodium reabsorption — this correctly answers the question.

35. What is the function of the loop of Henle in osmoregulation?

(A) Produces hormones
(B) Creates a concentration gradient
(C) Digests food
(D) Produces red blood cells

Correct Answer: B

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

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

(A) Overhydration
(B) Increased blood volume
(C) Dehydration
(D) Decreased body temperature

Correct Answer: C

Explanation: Dehydration — this correctly answers the question.

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

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

Correct Answer: D

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

38. A patient has a condition that causes decreased aldosterone secretion. Which of the following would be the most likely consequence?

(A) Increased sodium loss
(B) Decreased sodium loss
(C) Increased water retention
(D) Decreased urine volume

Correct Answer: A

Explanation: Increased sodium loss — this correctly answers the question.

39. Which of the following correctly describes the role of negative feedback in thermoregulation?

(A) It amplifies the change in temperature
(B) It reverses the change in temperature
(C) It has no effect on temperature
(D) It increases body temperature

Correct Answer: B

Explanation: It reverses the change in temperature — this correctly answers the question.

40. A patient has a condition that causes increased body temperature. Which of the following would most likely occur?

(A) Vasoconstriction and shivering
(B) Piloerection and increased metabolic rate
(C) Vasodilation and sweating
(D) Decreased heart rate

Correct Answer: C

Explanation: Vasodilation and sweating — this correctly answers the question.

41. A patient has a condition that causes decreased body temperature. Which of the following would most likely occur?

(A) Vasodilation and sweating
(B) Increased sweating
(C) Decreased metabolic rate
(D) Vasoconstriction and shivering

Correct Answer: D

Explanation: Vasoconstriction and shivering — this correctly answers the question.

42. Which of the following correctly describes the role of the hypothalamus in osmoregulation?

(A) It detects changes in blood osmolarity and regulates ADH release
(B) It produces urine
(C) It produces red blood cells
(D) It digests food

Correct Answer: A

Explanation: The hypothalamus detects changes in blood osmolarity and regulates ADH release from the posterior pituitary.

43. Which of the following correctly describes the role of the kidneys in homeostasis?

(A) They produce red blood cells
(B) They regulate water and electrolyte balance
(C) They digest food
(D) They produce hormones

Correct Answer: B

Explanation: They regulate water and electrolyte balance — this correctly answers the question.

44. A patient has a condition that causes increased blood osmolarity. Which of the following would most likely occur?

(A) Decreased ADH secretion
(B) Increased urine volume
(C) Increased ADH secretion

(D) Decreased water reabsorption

Correct Answer: C

Explanation: Increased blood osmolarity stimulates ADH secretion, which promotes water retention.

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

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

Correct Answer: D

Explanation: Decreased ADH secretion — this correctly answers the question.

46. Which of the following correctly describes the role of the countercurrent multiplier mechanism?

(A) It creates a concentration gradient in the medulla
(B) It produces hormones
(C) It digests food
(D) It produces red blood cells

Correct Answer: A

Explanation: The countercurrent multiplier mechanism creates a concentration gradient in the medulla that allows water reabsorption and urine concentration.

47. Which of the following correctly describes the role of the vasa recta?

(A) It produces hormones
(B) It maintains the concentration gradient
(C) It digests food
(D) It produces red blood cells

Correct Answer: B

Explanation: The vasa recta are specialized capillaries that maintain the concentration gradient in the medulla.

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

(A) Decreased blood pressure
(B) Increased urine volume
(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 renin-angiotensin-aldosterone system (RAAS)?

(A) It regulates temperature
(B) It regulates digestion
(C) It regulates reproduction
(D) It regulates blood pressure and fluid balance

Correct Answer: D

Explanation: The RAAS is a critical hormonal system that regulates blood pressure and fluid balance.

50. A patient has a condition that causes excessive water loss. Which of the following would be the most likely consequence?

(A) Dehydration
(B) Overhydration
(C) Increased blood volume
(D) Decreased blood pressure

Correct Answer: A

Explanation: Dehydration — this correctly answers the question.

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Biology Grade 12 — Chapter 9

Immunity

by Public Library

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

A. Important / Main Topics

1. The body's response to foreign particles, such as the production of antibodies directed against a specific antigen, is called:

(A) Immune response
(B) Digestion
(C) Respiration
(D) Excretion

Correct Answer: A

Explanation: The body's response to foreign particles, such as the production of antibodies directed against a specific antigen, is called an immune response.

2. Immunity is the ability to resist damage from:

(A) Self-cells
(B) Foreign substances such as microorganisms and harmful chemicals
(C) Nutrients
(D) Water

Correct Answer: B

Explanation: Immunity is the ability to resist damage from foreign substances such as microorganisms and harmful chemicals.

3. The study of foreign particles that can affect the living body and the defence mechanisms is called:

(A) Neurology
(B) Pathology
(C) Immunology
(D) Pharmacology

Correct Answer: C

Explanation: Immunology is the study of foreign particles that can affect the living body and the defence mechanisms taken by the body to eliminate these particles.

4. The first line of defence comprises:

(A) Internal barriers
(B) Specific internal defence
(C) Antibodies
(D) External barriers

Correct Answer: D

Explanation: First line of defence comprises external barriers that keep microbes out of the body.

5. The first line of defence includes:

(A) Skin and mucous membranes
(B) Macrophages and neutrophils
(C) T cells and B cells
(D) Antibodies

Correct Answer: A

Explanation: The first line of defence includes Skin and mucous membranes.

6. The second line of defence consists of:

(A) Specific internal defence

(B) Nonspecific internal defence
(C) External barriers
(D) Antibodies

Correct Answer: B

Explanation: Second line of defence consists of nonspecific internal defence that combats all invading microbes.

7. The first line and second line of defence together make:

(A) Acquired immunity
(B) Adaptive immunity
(C) Innate immunity
(D) Specific immunity

Correct Answer: C

Explanation: The first line and second line of defence together make Innate immunity.

8. The third line of defence includes:

(A) Nonspecific internal defence
(B) External barriers
(C) Skin
(D) Specific internal defence

Correct Answer: D

Explanation: Third line of defence includes the specific internal defence also called adaptive/acquired immunity.

9. The skin is made up of two layers: the:

(A) Epidermis and dermis
(B) Cortex and medulla
(C) Mucosa and serosa
(D) Epithelium and endothelium

Correct Answer: A

Explanation: The skin is made up of two layers, i.e., epidermis and dermis.

10. The protein that strengthens skin cells is:

(A) Collagen
(B) Keratin
(C) Elastin
(D) Melanin

Correct Answer: B

Explanation: Most cells of epidermis contain keratin protein that strengthens skin cells, making them resistant to abrasion and water loss.

11. The process of shedding dead skin cells is called:

(A) Keratinization
(B) Melanization
(C) Desquamation
(D) Ossification

Correct Answer: C

Explanation: Desquamation is the process of shedding dead skin cells which helps in removing attached microbes.

12. The glands that produce sebum are the:

(A) Sweat glands
(B) Salivary glands
(C) Endocrine glands
(D) Sebaceous glands

Correct Answer: D

Explanation: The glands that produce sebum are the Sebaceous glands.

13. Phagocytes are white blood cells that destroy abnormal cells or microorganisms by:

(A) Engulfing
(B) Releasing antibodies
(C) Producing hormones
(D) Secreting enzymes

Correct Answer: A

Explanation: A phagocyte is a cell that destroys other abnormal body cells or invaded microorganisms by engulfing.

14. The main types of phagocytic white blood cells are:

(A) T cells, B cells, and macrophages
(B) Macrophages, dendritic cells, and neutrophils
(C) Neutrophils, eosinophils, and basophils
(D) Red blood cells, white blood cells, and platelets

Correct Answer: B

Explanation: Main types of phagocytic white blood cells are macrophages, dendritic cells, and neutrophils.

15. The complement system consists of over:

(A) Ten types of small proteins
(B) Five types of small proteins
(C) Fifty types of small proteins
(D) Hundred types of small proteins

Correct Answer: C

Explanation: The complement system consists of over Fifty types of small proteins.

16. What is the function of sebum?

(A) Increases skin pH
(B) Produces keratin
(C) Produces melanin
(D) Lowers skin pH

Correct Answer: D

Explanation: Sebum contains fatty acids that lower skin pH, inhibiting the growth of many pathogens.

17. What is the function of macrophages?

(A) Engulf and destroy microbes; present antigens
(B) Produce antibodies
(C) Produce hormones
(D) Produce red blood cells

Correct Answer: A

Explanation: Macrophages engulf and destroy microbes and display parts of microbes on their surface as antigen-presenting cells.

18. What is the function of dendritic cells?

(A) Produce antibodies
(B) Activate T cells
(C) Produce hormones
(D) Produce red blood cells

Correct Answer: B

Explanation: The main function of dendritic cells is the activation of T cells.

19. What is the function of neutrophils?

(A) Produce antibodies
(B) Produce hormones
(C) Engulf and destroy microbes; release lysosomal enzymes
(D) Produce red blood cells

Correct Answer: C

Explanation: Engulf and destroy microbes; release lysosomal enzymes — this correctly answers the question.

20. What is the function of the membrane attack complex (MAC)?

(A) Produces antibodies
(B) Produces hormones
(C) Produces red blood cells
(D) Produces holes in bacterial cell walls

Correct Answer: D

Explanation: Produces holes in bacterial cell walls — this correctly answers the question.

21. What is the function of interferons?

(A) Interfere with viral replication
(B) Produce antibodies
(C) Produce hormones
(D) Produce red blood cells

Correct Answer: A

Explanation: Interferons are named for their ability to "interfere" with viral replication.

22. What is the function of histamine in inflammation?

(A) Produces antibodies
(B) Induces vasodilation and leakiness of blood vessels
(C) Produces hormones
(D) Produces red blood cells

Correct Answer: B

Explanation: Induces vasodilation and leakiness of blood vessels — this correctly answers the question.

23. What is the function of pyrogens?

(A) Lower the temperature set point of the hypothalamus
(B) Produce antibodies
(C) Raise the temperature set point of the hypothalamus
(D) Produce hormones

Correct Answer: C

Explanation: Raise the temperature set point of the hypothalamus — this correctly answers the question.

24. What is the function of endogenous pyrogens?

(A) Decrease the temperature set point of the hypothalamus
(B) Produce antibodies
(C) Produce hormones
(D) Further increase the temperature set point of the hypothalamus

Correct Answer: D

Explanation: Further increase the temperature set point of the hypothalamus — this correctly answers the question.

25. What is the function of T cells in cell-mediated immunity?

(A) Directly attack infected cells
(B) Produce antibodies
(C) Produce hormones
(D) Produce red blood cells

Correct Answer: A

Explanation: The immune response provided by T cells is called cell mediated immune response, which involves direct attack on infected cells.

B. Less Important / Secondary Topics

26. What is the function of B cells in humoral immunity?

(A) Produce antibodies
(B) Directly attack infected cells
(C) Produce hormones

(D) Produce red blood cells

Correct Answer: A

Explanation: The stimulation of B cells to divide into plasma clone cells and memory B cells and the secretion of antibodies by plasma clone cells is called humoral mediated immune response.

27. What is the function of memory B cells?

(A) Produce antibodies immediately
(B) Provide long-lasting immunity
(C) Directly attack infected cells
(D) Produce hormones

Correct Answer: B

Explanation: Memory B cells divide to make more plasma cells and memory cells that can protect against future attacks by the same antigen.

28. What is the function of cytotoxic T cells?

(A) Produce antibodies
(B) Produce hormones
(C) Destroy infected cells
(D) Produce red blood cells

Correct Answer: C

Explanation: Cytotoxic T cells secrete cytotoxic which triggers destruction of the pathogen's DNA or perforin which creates holes in the pathogen's plasma membrane.

29. What is the function of helper T cells?

(A) Destroy infected cells
(B) Produce antibodies
(C) Produce hormones
(D) Stimulate cell division of T cells and B cells

Correct Answer: D

Explanation: Helper T cells secrete interleukin 2 which stimulates cell division of T cells and B cells.

30. What is the function of suppressor T cells?

(A) Shut down the immune response
(B) Stimulate immune response
(C) Produce antibodies
(D) Produce hormones

Correct Answer: A

Explanation: Suppressor T cells begin to secrete certain proteins that inhibit further proliferation of T cell, shutting down the immune response.

31. What is the function of memory T cells?

(A) Produce antibodies immediately
(B) Respond to same antigen later
(C) Destroy infected cells immediately
(D) Produce hormones

Correct Answer: B

Explanation: Respond to same antigen later — this correctly answers the question.

32. What is active immunity?

(A) Antibodies passed from one individual to another
(B) Antibodies from mother to foetus
(C) Body manufactures its own antibodies
(D) Antibodies injected into another individual

Correct Answer: C

Explanation: Active immunity is the kind of immunity which is obtained as a result of an infection; the body manufactures its own antibodies.

33. What is passive immunity?

(A) Body manufactures its own antibodies
(B) Vaccination
(C) Infection
(D) Antibodies passed from one individual to another

Correct Answer: D

Explanation: In passive immunity antibodies from one individual are passed into another individual.

34. What is natural active immunity?

(A) Obtained as a result of an infection
(B) Achieved by vaccination
(C) Antibodies from mother to foetus
(D) Antibodies injected into another individual

Correct Answer: A

Explanation: Natural active immunity is the kind of immunity which is obtained as a result of an infection.

35. What is artificial active immunity?

(A) Obtained as a result of an infection
(B) Achieved by vaccination
(C) Antibodies from mother to foetus
(D) Antibodies injected into another individual

Correct Answer: B

Explanation: Artificial Active Immunity (vaccination) is achieved by injecting small amounts of antigen, called the vaccine, into the body of an individual.

36. A patient has a condition that causes a defective immune response to allergens. Which of the following is the most likely diagnosis?

(A) Autoimmune disease
(B) Transplant rejection
(C) Allergy
(D) Immunodeficiency

Correct Answer: C

Explanation: Allergies are defective immune responses leading to chronic health conditions like Hay fever, eczema, asthma and food allergy.

37. A patient has a condition where the immune system attacks healthy cells. Which of the following is the most likely diagnosis?

(A) Allergy
(B) Transplant rejection
(C) Immunodeficiency
(D) Autoimmune disease

Correct Answer: D

Explanation: Autoimmune disease — this correctly answers the question.

38. A patient has a condition where the immune system attacks transplanted tissue. Which of the following is the most likely diagnosis?

(A) Transplant rejection
(B) Allergy
(C) Autoimmune disease
(D) Immunodeficiency

Correct Answer: A

Explanation: Such a response is called transplant rejection.

39. Which of the following correctly describes the role of IgE in allergies?

(A) Produces antibodies

(B) Binds with basophils to release histamine
(C) Produces hormones
(D) Produces red blood cells

Correct Answer: B

Explanation: IgE binds with basophils to release inflammatory chemicals like histamine.

40. Which of the following correctly describes the role of antihistamine drugs?

(A) Increase histamine release
(B) Produce antibodies
(C) Block some of the effects of histamine
(D) Produce hormones

Correct Answer: C

Explanation: Block some of the effects of histamine — this correctly answers the question.

41. Which of the following correctly describes the role of vaccination?

(A) Develop passive acquired immunity
(B) Develop innate immunity
(C) Develop autoimmune disease
(D) Develop active acquired immunity

Correct Answer: D

Explanation: Vaccination is a means to develop active acquired immunity.

42. Which of the following correctly describes the role of colostrum?

(A) Provides natural passive immunity
(B) Provides artificial passive immunity
(C) Provides natural active immunity
(D) Provides artificial active immunity

Correct Answer: A

Explanation: Passive immunity may also be provided by colostrum, the first secretion of the mammary glands.

43. Which of the following correctly describes the role of antivenoms?

(A) Provide natural passive immunity
(B) Provide artificial passive immunity
(C) Provide natural active immunity
(D) Provide artificial active immunity

Correct Answer: B

Explanation: Antibodies against rabies and some snake venoms are examples of artificial passive immunity.

44. Which of the following correctly describes the primary immune response?

(A) Following contacts with the same pathogen
(B) Memory cell response
(C) First contact of the immune system with an infectious agent
(D) Antibody-mediated response

Correct Answer: C

Explanation: The primary immune response displays the first contact of the immune system with an infectious agent.

45. Which of the following correctly describes the secondary immune response?

(A) Slower and weaker than primary response
(B) First contact with an infectious agent
(C) Forms memory cells
(D) Faster and stronger than primary response

Correct Answer: D

Explanation: Secondary immune response is faster and stronger than primary response.

46. Which of the following correctly describes the role of T cells in transplant rejection?

(A) Attack the transplanted tissue

(B) Protect the transplanted tissue
(C) Produce antibodies
(D) Produce hormones

Correct Answer: A

Explanation: Antigen-specific TH cells stimulate the activation and proliferation of appropriate T cells, which then enhance a focused attack on the transplant tissue.

47. Which of the following correctly describes the role of B cells in transplant rejection?

(A) Attack the transplanted tissue directly
(B) Produce antibodies against the transplanted tissue
(C) Protect the transplanted tissue
(D) Produce hormones

Correct Answer: B

Explanation: The responsive helper T cell interacts with the appropriate B cell clone, producing a shower of antibodies to the implanted tissue's MHC antigens.

48. A patient receiving a kidney transplant is given immunosuppressive drugs. Which of the following is the most likely reason?

(A) To improve kidney function
(B) To increase immune response
(C) To prevent rejection of the transplanted kidney
(D) To decrease blood pressure

Correct Answer: C

Explanation: Patients are required to take medications such as cyclosporine to suppress their immune system in order to prevent rejection of the transplanted kidney.

49. Which of the following correctly describes the side effects of immunosuppressive drugs?

(A) Improved immune function
(B) Decreased risk of infection
(C) Increased kidney function
(D) Pain, diarrhoea, leukopenia, sepsis, lymphoma

Correct Answer: D

Explanation: Pain, diarrhoea, leukopenia, sepsis, lymphoma — this correctly answers the question.

50. Which of the following correctly describes the role of the inflammatory response?

(A) Eliminate the initial cause of cell injury and initiate tissue repair
(B) Produce antibodies
(C) Produce hormones
(D) Produce red blood cells

Correct Answer: A

Explanation: The function of inflammation is to eliminate the initial cause of cell injury, clear out necrotic cells and tissues damaged from the original insult and the inflammatory process, and to initiate tissue repair.

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Biology Grade 12 — Chapter 10

Biotechnology

by Public Library

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

A. Important / Main Topics

1. Biotechnology can be defined as the use of living organisms especially microorganisms or their processes and products for the:

(A) Welfare of mankind
(B) Destruction of mankind
(C) Harm of animals
(D) Pollution of environment

Correct Answer: A

Explanation: Biotechnology can be defined as "use of living organisms especially microorganisms or their processes and products for the welfare of mankind".

2. The term biotechnology was introduced by the end of the:

(A) 18th century
(B) 20th century
(C) 19th century
(D) 21st century

Correct Answer: B

Explanation: The term biotechnology was introduced by the end of the 20th century.

3. Genetic engineering deals with:

(A) Digestion of food
(B) Circulation of blood
(C) Manipulation of genetic material
(D) Respiration

Correct Answer: C

Explanation: Genetic engineering deals with manipulation or alteration in genetic material of an organism to modify its characteristics or capabilities for human welfare.

4. The basis of genetic engineering lies on the technique called:

(A) PCR
(B) Gel electrophoresis
(C) Chromatography
(D) Recombinant DNA technology

Correct Answer: D

Explanation: Basis of genetic engineering lies on the technique called Recombinant DNA Technology which involves the combining DNA (genes) from different sources to create new genetic combinations.

5. Recombinant DNA technology involves combining DNA from:

(A) Different sources
(B) Same source
(C) One gene
(D) One chromosome

Correct Answer: A

Explanation: Recombinant DNA technology involves the combining DNA (genes) from different sources to create new genetic combinations.

6. Restriction endonucleases are enzymes that:

(A) Join DNA fragments
(B) Cleave phosphodiester bonds of both DNA strands
(C) Synthesize proteins
(D) Synthesize RNA

Correct Answer: B

Explanation: Restriction endonucleases are enzymes that cleave the phosphodiester bonds of both strands of DNA duplex at specific sequences.

7. The first restriction enzyme was isolated in:

(A) 1950
(B) 1960
(C) 1970
(D) 1980

Correct Answer: C

Explanation: The first restriction enzyme was isolated in 1970.

8. Plasmids are:

(A) Large linear DNA molecules
(B) Proteins
(C) Carbohydrates
(D) Small circular DNA molecules

Correct Answer: D

Explanation: Plasmids are small circular DNA molecules naturally found in bacterial cells.

9. pBR322 is a:

(A) Plasmid vector
(B) Restriction enzyme
(C) DNA ligase
(D) Antibiotic

Correct Answer: A

Explanation: pBR322 is the first and most common purpose-built plasmid vector.

10. The size of pBR322 is:

(A) 1,425 bps
(B) 4,361 bps
(C) 10,000 bps
(D) 500 bps

Correct Answer: B

Explanation: pBR322 is relatively small plasmid having 4,361 bps.

11. DNA ligase is called:

(A) Molecular scissors
(B) Molecular vector
(C) Molecular glue
(D) Molecular carrier

Correct Answer: C

Explanation: DNA ligase is called molecular glue because it joins two double-stranded DNA fragments.

12. The polymerase chain reaction (PCR) was invented by:

(A) Frederick Sanger
(B) Watson and Crick
(C) Edward Jenner
(D) Kary B. Mullis

Correct Answer: D

Explanation: The polymerase chain reaction (PCR) was invented by Kary B. Mullis.

13. The special DNA polymerase used in PCR is:

(A) Taq polymerase
(B) DNA ligase
(C) Restriction endonuclease
(D) Reverse transcriptase

Correct Answer: A

Explanation: A special DNA polymerase, the Taq polymerase is used in PCR technique.

14. Taq polymerase is isolated from:

(A) Escherichia coli
(B) Thermus aquaticus
(C) Haemophilus influenzae
(D) Xanthomonas holcicola

Correct Answer: B

Explanation: Taq polymerase is a specialized temperature-tolerant enzyme isolated from Thermus aquaticus.

15. The instrument used in PCR is called a:

(A) Centrifuge
(B) Spectrophotometer
(C) Thermocycler
(D) Electrophoresis unit

Correct Answer: C

Explanation: The PCR mixture is placed in an instrument called thermocycler or PCR machine.

16. What is the function of restriction endonucleases in genetic engineering?

(A) To join DNA fragments
(B) To synthesize proteins
(C) To synthesize RNA
(D) To cut the gene of interest

Correct Answer: D

Explanation: Restriction endonucleases are used to cut the gene of interest during genetic recombination.

17. How do bacteria protect their own DNA from restriction endonucleases?

(A) By adding methyl groups to their restriction sites
(B) By adding acetyl groups
(C) By adding phosphate groups
(D) By adding hydroxyl groups

Correct Answer: A

Explanation: By adding methyl groups to their restriction sites — this correctly answers the question.

18. What is a palindromic sequence?

(A) A sequence arranged in the same order in both strands
(B) A sequence arranged symmetrically in reverse order in both complementary DNA strands
(C) A sequence with no symmetry
(D) A sequence with only one strand

Correct Answer: B

Explanation: A palindromic sequence is a four to eight base pairs in DNA in which nucleotides are arranged symmetrically in reverse order in both complementary DNA strands.

19. What are sticky ends?

(A) Double stranded ends of DNA fragments
(B) Blunt ends of DNA fragments
(C) Single stranded projected ends of DNA fragments
(D) Methylated ends of DNA fragments

Correct Answer: C

Explanation: A staggered cut is one in which the resulting duplex fragments show single stranded projected ends called sticky ends.

20. What is the function of the origin of replication in a plasmid?

(A) Production of proteins
(B) Digestion of DNA
(C) Synthesis of RNA
(D) Self-regulated replication of the plasmid

Correct Answer: D

Explanation: Plasmids contain an origin of replication (Ori) site which is required for self-regulated replication of the plasmid in the host cell.

21. What is the function of antibiotic resistance genes in plasmids?

(A) Selection of transformed cells
(B) Digestion of DNA
(C) Synthesis of proteins
(D) Synthesis of RNA

Correct Answer: A

Explanation: Markers help in the selecting of cells (bacteria) that have successfully taken up the recombinant plasmids.

22. What is the function of promoter regions in plasmids?

(A) Enable replication of plasmid
(B) Enable transcription of inserted genes
(C) Enable translation of mRNA
(D) Enable digestion of DNA

Correct Answer: B

Explanation: Plasmids may contain promoter sequences that enable the transcription of inserted genes in the host cell.

23. What is the function of DNA ligase in recombinant DNA technology?

(A) Cuts DNA fragments
(B) Synthesizes proteins
(C) Joins DNA fragments
(D) Synthesizes RNA

Correct Answer: C

Explanation: DNA ligase is used to join two different DNA fragments (plasmid/vector and the foreign DNA) that are annealed by the sticky ends.

24. What is the function of an expression system?

(A) Cuts DNA
(B) Joins DNA
(C) Synthesizes antibiotics
(D) Host for the recombinant vector

Correct Answer: D

Explanation: Host for the recombinant vector — this correctly answers the question.

25. What is transformation in recombinant DNA technology?

(A) Insertion of recombinant DNA into the expression system
(B) Cutting of DNA
(C) Joining of DNA
(D) Synthesis of proteins

Correct Answer: A

Explanation: Transformation refers to the insertion of recombinant DNA into the expression system.

B. Less Important / Secondary Topics

26. What is the function of calcium chloride in transformation?

(A) Makes bacterial cells more permeable
(B) Cuts DNA
(C) Joins DNA
(D) Synthesizes proteins

Correct Answer: A

Explanation: Bacterial cells take up recombinant plasmid, especially, if they are treated with calcium chloride which make them more permeable.

27. How are transformed clones identified?

(A) By adding a nutrient
(B) By adding an antibiotic
(C) By adding a hormone
(D) By adding a vitamin

Correct Answer: B

Explanation: The transformed clone can be identified by adding a particular antibiotic (for which resistant gene is found in plasmid) into the medium.

28. What is the first step in the production of human insulin by recombinant DNA technology?

(A) Selection of plasmid
(B) Creation of recombinant DNA
(C) Identification and isolation of the insulin gene
(D) Insertion into host cells

Correct Answer: C

Explanation: The insulin gene, which produces human insulin, is isolated from a human DNA sample.

29. Where is the insulin gene located?

(A) Chromosome 1 at position 1p15.5
(B) Chromosome 21 at position 21p15.5
(C) Chromosome 11 at position 11q15.5
(D) Chromosome 11 at position 11p15.5

Correct Answer: D

Explanation: Gene for insulin is called INS and is located on the human chromosome 11 at position 11p15.5.

30. How many amino acids are in the α chain of insulin?

(A) 21
(B) 30
(C) 51
(D) 109

Correct Answer: A

Explanation: 21 — this correctly answers the question.

31. How many amino acids are in the β chain of insulin?

(A) 21
(B) 30
(C) 51
(D) 109

Correct Answer: B

Explanation: 30 — this correctly answers the question.

32. Which enzyme is used in PCR to synthesize new DNA strands?

(A) DNA ligase
(B) Restriction endonuclease
(C) Taq polymerase
(D) Reverse transcriptase

Correct Answer: C

Explanation: Taq polymerase — this correctly answers the question.

33. What is the temperature for cyclic denaturation in PCR?

(A) 55°C
(B) 72°C
(C) 4°C
(D) 94°C

Correct Answer: D

Explanation: The template DNA is heated to 94°C for one minute during cyclic denaturation.

34. What is the temperature for primer annealing in PCR?

(A) 55–65°C
(B) 94°C
(C) 72°C
(D) 4°C

Correct Answer: A

Explanation: In standard cases temperature is between 55°–65°C for primer annealing.

35. What is the temperature for cyclic extension in PCR?

(A) 94°C
(B) 72°C
(C) 55°C
(D) 4°C

Correct Answer: B

Explanation: The optimum temperature for carrying out the primer extension reaction or polymerization of dNTPs is standardized at 72°C.

36. A patient has a condition that causes a deficiency of insulin. Which of the following is the most likely consequence?

(A) Diabetes insipidus
(B) Gigantism
(C) Diabetes mellitus
(D) Acromegaly

Correct Answer: C

Explanation: Diabetes mellitus — this correctly answers the question.

37. Which of the following correctly describes the role of β-galactosidase in insulin production?

(A) Enzyme that digests insulin
(B) Enzyme that synthesizes insulin
(C) Enzyme that cuts DNA
(D) Fusion protein that protects insulin chains

Correct Answer: D

Explanation: Both chains are produced as part of a fusion proteins, which help in protecting the insulin chains from bacterial protease enzymes during bacterial synthesis.

38. Which chemical is used to separate insulin chains from fusion proteins?

(A) Cyanogen bromide
(B) Sodium disulphonate
(C) Sodium sulphite
(D) Calcium chloride

Correct Answer: A

Explanation: Pro-insulin chains A and B are separated from fusion proteins, β-galactosidase by chemical treatment with cyanogen bromide.

39. Which chemicals are used to form disulphide bridges in insulin?

(A) Cyanogen bromide and calcium chloride
(B) Sodium disulphonate and sodium sulphite
(C) Hydrochloric acid and sodium hydroxide
(D) Ethanol and methanol

Correct Answer: B

Explanation: Disulphide bridges at cysteine residues of both insulin peptide chains are formed by treating with sodium disulphonate and sodium sulphite.

40. Which of the following correctly describes the role of Taq polymerase in PCR?

(A) Cuts DNA
(B) Joins DNA
(C) Synthesizes new DNA strands
(D) Synthesizes RNA

Correct Answer: C

Explanation: Synthesizes new DNA strands — this correctly answers the question.

41. Why is Taq polymerase used in PCR instead of human DNA polymerase?

(A) Taq polymerase is cheaper
(B) Taq polymerase is more accurate
(C) Taq polymerase is faster
(D) Taq polymerase is stable at high temperatures

Correct Answer: D

Explanation: Taq polymerase is a specialized temperature-tolerant enzyme isolated from Thermus aquaticus which is s.

42. What is the purpose of initial denaturation in PCR?

(A) To completely denature the DNA template
(B) To synthesize new DNA
(C) To anneal primers
(D) To store PCR products

Correct Answer: A

Explanation: Initial denaturation is performed to completely denature the DNA template and ensure all strands are separated before cycling begins.

43. What is the purpose of final extension in PCR?

(A) To denature DNA
(B) For complete synthesis of all PCR products
(C) To anneal primers
(D) To store PCR products

Correct Answer: B

Explanation: Final extension is performed for complete synthesis of all PCR products by Taq DNA polymerase.

44. Which of the following correctly describes the exponential amplification in PCR?

(A) The number of DNA molecules increases linearly
(B) The number of DNA molecules remains constant
(C) The number of DNA molecules doubles after each cycle
(D) The number of DNA molecules decreases

Correct Answer: C

Explanation: The number of DNA molecules doubles after each cycle — this correctly answers the question.

45. A patient has a condition that causes a deficiency of ADH. Which of the following is the most likely consequence?

(A) Diabetes mellitus
(B) Gigantism
(C) Acromegaly
(D) Diabetes insipidus

Correct Answer: D

Explanation: Diabetes insipidus — this correctly answers the question.

46. Which of the following correctly describes the role of the promoter in a plasmid?

(A) Enables transcription of inserted genes
(B) Enables replication of plasmid
(C) Enables translation of mRNA
(D) Enables digestion of DNA

Correct Answer: A

Explanation: Plasmids may contain promoter sequences that enable the transcription of inserted genes in the host cell.

47. Which of the following correctly describes the role of antibiotic resistance genes in plasmids?

(A) Digestion of DNA
(B) Selection of transformed cells
(C) Synthesis of proteins
(D) Synthesis of RNA

Correct Answer: B

Explanation: Markers help in the selecting of cells (bacteria) that have successfully taken up the recombinant plasmids.

48. Which of the following correctly describes the role of the origin of replication in a plasmid?

(A) Production of proteins
(B) Digestion of DNA
(C) Self-regulated replication of the plasmid
(D) Synthesis of RNA

Correct Answer: C

Explanation: Plasmids contain an origin of replication (Ori) site which is required for self-regulated replication of the plasmid in the host cell.

49. Which of the following correctly describes the role of DNA ligase in recombinant DNA technology?

(A) Cuts DNA fragments
(B) Synthesizes proteins
(C) Synthesizes RNA
(D) Joins DNA fragments

Correct Answer: D

Explanation: DNA ligase is used to join two different DNA fragments (plasmid/vector and the foreign DNA) that are annealed by the sticky ends.

50. Which of the following correctly describes the role of restriction endonucleases in genetic engineering?

(A) Cut the gene of interest
(B) Join DNA fragments
(C) Synthesize proteins
(D) Synthesize RNA

Correct Answer: A

Explanation: Restriction endonucleases are used to cut the gene of interest during genetic recombination.