

BIOLOGY 12 – PROVINCIAL EXAM MULTIPLE CHOICE QUESTION GUIDE

This package represents a **very powerful learning tool** for you. It contains a large collection of multiple choice questions from past Provincial Exams. The questions are organized by topic in the same order that we will cover in class. At the end of this package is an **answer key**. My recommendations for using this resource are as follows:

1. **DO ALL THE QUESTIONS** in this booklet. These are actual Provincial Exam questions! Your final exam will include questions very much like these ones AND my unit tests will feature some of these very same questions!
2. **RESIST THE URGE TO LOOK AT THE ANSWER KEY** until you have given all the questions in the section your best effort. Don't do one question, then look at the key, then do another and look at the key, and so on. Each time you look one answer in the key, your eye will notice other answers around them, and this will reduce the effectiveness of those questions in helping you to learn.
3. **LEARN FROM YOUR MISTAKES!** If you get a question wrong, **figure out why!** Get together with other students from class and work on these questions together. Explain how you got your answers to tough questions to others. In explaining yourself to someone else, you will learn the material better yourself (try it!!) Ask your teacher to explain the question to you during class or after school. **Your goal should be to get 100% on any Biology 12 multiple choice test** – learning from your mistakes in this booklet will really help you in your efforts to meet this goal!
4. **This is REALLY CRUCIAL: Do Not – I repeat – DO NOT, mark the answer anywhere on the questions themselves.** For example, do not circle any of A B C or D's in the choices. Why not? If you do, you can *never* use that question *effectively* again to study. Instead, **I recommend that you write your answers on separate sheets of paper.** That way, you can test yourself effectively over and over again. Just to the left of the question number, there is a box. Use this box to put an asterisk or small note to yourself. For example, an asterisk ("*") might mean that you got that question wrong and need to come back to it again after reviewing the course material again. A check mark might mean that you have gotten this question right three times in a row, and you never need to go over it again. You get the idea?

TABLE OF CONTENTS

| | |
|--------------------------------------|----|
| BIOLOGICAL MOLECULES | 1 |
| DNA & PROTEIN SYNTHESIS | 3 |
| THE CELL | 4 |
| CELL MEMBRANE & TRANSPORT | 5 |
| ENZYMES | 5 |
| DIGESTION & HUMAN ORGANIZATION | 6 |
| CIRCULATORY SYSTEM | 8 |
| BLOOD | 10 |
| RESPIRATORY SYSTEM | 11 |
| EXCRETORY SYSTEM | 13 |
| NERVOUS SYSTEM | 14 |
| REPRODUCTIVE SYSTEM | 18 |
| ANSWER KEY!! | 19 |

BIOLOGICAL MOLECULES

| | |
|-----|--|
| 1. | The factor being tested in an experiment is the A. data. B. variable. C. conclusion. D. observation. |
| 2. | A possible explanation for an event that occurs in nature is called a(n) A. prediction. B. hypothesis. C. observation. D. analysis of data. |
| 3. | Using the information below, what is the correct order for the steps of scientific inquiry? 1. Theory 2. Conclusion 3. Hypothesis 4. Experimentation A. 1, 3, 2, 4 B. 3, 4, 1, 2 C. 3, 4, 2, 1 D. 4, 1, 2, 3 |
| 4. | 1. State a theory. 2. Collect data. 3. Formulate a hypothesis. 4. Experiment. Which of the following is the correct order for the scientific method? A. 1, 3, 4, 2 B. 1, 4, 2, 3 C. 3, 1, 2, 4 D. 3, 4, 2, 1 |
| 5. | The part of an experiment that is subjected to all of the procedures except the one being tested is called the A. data. B. control. C. test sample. D. dependent variable. |
| 6. | An explanation for observed phenomena that is supported by many experiments is called A. a theory. B. a control. C. homeostasis. D. an hypothesis. |
| 7. | A group of people was used to test the effectiveness of a new toothpaste compared to their regular toothpaste. Which of the following procedures represents a controlled test? A. Have everyone in the group brush with the new toothpaste. B. Have everyone brush with both their regular toothpaste and the new toothpaste. C. Have half the group brush with the new toothpaste and the other half not brush their teeth. D. Have half the group brush with the new toothpaste and the other half with their regular tooth-paste. |
| 8. | The growth rate in most plants increases when water supply is plentiful. A possible explanation would be that water is a reactant in photosynthesis. This explanation is an example of A. a theory. B. a hypothesis. C. a conclusion. D. an observation. |
| 9. | The maintenance of the body's constant internal environment is termed A. synthesis. B. hydrolysis. C. replication. D. homeostasis. |
| 10. | A role of water in cells of the human body is to A. emulsify fats. B. act as a solvent. C. act as an enzyme. D. denature proteins. |

| | |
|-----|--|
| 11. | A water molecule joins with an adjacent water molecule by forming a(n) A. ionic bond. B. peptide bond. C. covalent bond. D. hydrogen bond. |
| 12. | Which of the following is necessary for hydrogen bonding? A. Peptide bonds. B. Hydrogen ions. C. Polar molecules. D. Equal sharing of electrons. |
| 13. | The polarity of a water molecule results from A. more of the protons being in the hydrogen nucleus. B. more of the electrons being near the hydrogen nucleus. C. the equal numbers of protons in hydrogen and oxygen. D. the unequal sharing of electrons between hydrogen and oxygen. |
| 14. | Water molecules are connected to each other by A. buffers. B. hydrolysis. C. peptide bonds. D. hydrogen bonds. |
| 15. | Water allows chemical reactions in cells to occur because it A. acts as a solvent. B. evaporates readily. C. is less dense as a solid. D. promotes dehydration synthesis. |
| 16. | If the pH of a solution changes from 2 to 5, then the solution has A. become a base. B. lost hydrogen ions. C. become more acidic. D. gained hydrogen ions. |
| 17. | A substance that prevents large changes in the pH of a solution is A. DNA. B. water. C. a buffer. D. an enzyme. |
| 18. | Substances that increase the concentration of hydrogen ions in a solution are A. acids. B. bases. C. enzymes. D. polar molecules. |
| 19. | Blood has a pH that is slightly basic. A sample of blood containing a buffer is treated with a weak acid. Which pH value would result? A. 1.57 B. 6.78 C. 7.38 D. 13.21 |
| 20. | The pH of blood is slightly basic. Which of the following would be the pH of blood? A. 2.0 B. 6.8 C. 7.4 D. 10.3 |
| 21. | Acids are defined as compounds that dissociate in water to release A. chloride ions Cl^- B. calcium ions Ca^{++} C. hydrogen ions H^+ D. hydroxide ions OH^- |
| 22. | Which of the following differences between acids and bases is correct? A. Acids are harmful, bases are not. B. Acids lower the pH, bases raise the pH. C. Acids release amino groups, bases release glycerol. D. Acids release hydroxide ions, bases release hydrogen ions. |
| 23. | Organisms maintain pH at a constant level through the use of A. salts. B. water. C. buffers. D. carbohydrates. |
| 24. | The process that joins amino acids together to make enzymes is A. oxidation. B. hydrolysis. C. denaturation. D. dehydration synthesis. |
| 25. | Which of the following is a unit molecule of hydrolysis? A. ADP when it is being converted into ATP. B. Cellulose when it is being converted into glucose. C. Fatty acids when they are being converted into lipid. D. Amino acids when they are being converted into protein. |
| 26. | Which of the following is an amino (amine) group? A. NH_2 B. OH^{-1} C. PO_4^{-3} D. COOH |
| 27. | The level of protein structure represented by the alpha-helix shape is A. primary. B. secondary. C. tertiary. D. quaternary. |
| 28. | The linear sequence of amino acids found in an enzyme is called its A. tertiary structure. B. primary structure. C. secondary structure. D. quaternary structure. |
| 29. | Proteins may denature when A. pH is changed. B. oxygen is present. C. they form enzymes. D. substrate concentration is increased. |
| 30. | When a protein loses its normal three-dimensional configuration, it is said to be A. saturated. B. denatured. C. neutralized. D. synthesized. |
| 31. | Which of the following is a function of some proteins? A. Emulsify fats. B. Make up genes. C. Make up cell walls. D. Speed up chemical reactions. |
| 32. | A glucose molecule contains A. six carbon atoms. B. two high-energy phosphates. C. three fatty acids and glycerol. D. a long chain of carbohydrate rings. |
| 33. | The building blocks or monomers that make up carbohydrates are A. nucleotides. B. amino acids. C. monosaccharides. D. fatty acids and glycerol. |
| 34. | Which of the following molecules is a carbohydrate? A. $\text{C}_3\text{H}_7\text{O}_2\text{N}$ B. $\text{C}_6\text{H}_{12}\text{O}_6$ C. $\text{C}_{13}\text{H}_{26}\text{O}_2$ D. $\text{C}_{20}\text{H}_{40}\text{O}_2$ |
| 35. | Carbohydrates are composed of A. amino acids. B. nucleic acids. C. monosaccharides. D. glycerol and fatty acids. |
| 36. | The unit molecule of a protein is A. glucose. B. glycerol. C. a fatty acid. D. an amino acid. |
| 37. | Glucose in cells is used primarily A. as an energy source. B. to produce membranes. C. to store genetic material. D. to produce enzymes that catalyze reactions. |
| 38. | The breakdown of a disaccharide may produce A. glucose. B. glycerol. C. fatty acids. D. amino acids. |
| 39. | The bending and folding of a protein molecule would produce a A. tertiary structure. B. primary structure. C. secondary structure. D. linear sequence of amino acids. |
| 40. | Which of the following is made up of a long chain of glucose molecules? A. DNA. B. Starch. C. Pepsin. D. Phospholipid. |
| 41. | The bonding of a glucose molecule and a maltose molecule would result in a A. triglyceride. B. disaccharide. C. phospholipid. D. polysaccharide. |
| 42. | The hydrolysis of which of the following substances will produce the greatest number of glucose molecules? A. Maltose. B. Sucrose. C. A disaccharide. D. A polysaccharide. |
| 43. | The major component of a plant cell wall is a product formed from the dehydration synthesis of A. fatty acids. B. nucleotides. C. amino acids. D. monosaccharides. |
| 44. | The main difference between cellulose and starch molecules is A. the type of linkage between glucose subunits. B. that only cellulose contains ribose building blocks. C. that only starch is made from glucose building blocks. D. the type of monosaccharide used to form these polymers. |
| 45. | How many double bonds are there between carbon atoms in a saturated fatty acid? A. 0 B. 1 C. 2 D. more than 2 |
| 46. | A characteristic of unsaturated fats is that they A. denature as they cool. B. are made up of glucose and fructose. C. are made up of amino acids and glycerol. D. have double bonds in their carbon chains. |
| 47. | Which of the following are components of a phospholipid? A. cholesterol, glycerol, fatty acids B. fatty acids, phosphate group, glycerol C. glycerol, amino acids, phosphate group D. phosphate group, cholesterol, monosaccharides |
| 48. | Compared to saturated fats, unsaturated fats contain less A. oxygen. B. glycerol. C. hydrogen. D. fatty acids. |
| 49. | A lipid molecule is produced when A. fatty acids bond to glycerol. B. amino acids bond to glycerol. C. monosaccharides bond to glycogen. D. dehydration occurs between fatty acids and glycogen. |
| 50. | Lipids are composed of A. nucleotides. B. amino acids. C. monosaccharides. D. glycerol and fatty acids. |
| 51. | The carbon chain of a saturated fatty acid A. has no double bonds. B. is the basis of the ATP molecule. C. forms hydrogen bonds with itself. D. has a repeating backbone of sugars and phosphates. |
| 52. | An unsaturated fat could be changed into a saturated fat if A. peptide bonds were broken. B. hydrogen atoms were added. C. glycerol molecules were added. D. fatty acid chains were shortened. |
| 53. | Fatty acids containing double bonds are found in A. proteins. B. saturated lipids. C. polysaccharides. D. unsaturated lipids. |
| 54. | Which of the following types of bonding occurs during complementary base pairing? A. ionic B. peptide C. covalent D. hydrogen |

| | |
|-----|--|
| 55. | Nucleic acids are composed of A. glucose B. enzymes C. fatty acids D. nucleotides. |
| 56. | Energy released from the breakdown of monosaccharides in the cytoplasm is stored in A. ATP. B. RNA. C. DNA. D. ADH. |
| 57. | Which of the following is not a part of a nucleotide? A. Sugar. B. Glycerol. C. Phosphate. D. Nitrogen base. |
| 58. | Which of the following is composed of nucleotides? A. Fat. B. RNA. C. Starch. D. Protein. |
| 59. | In the human body, steroid molecules can act as A. buffers. B. vacuoles. C. hormones. D. coenzymes. |
| 60. | Which of the following represents the structure of a nucleotide? A. Salt – lipid – base. B. Glucose – glucose – glucose. C. Phosphate – sugar – nitrogenous base. D. Amino acid – amino acid – amino acid. |
| 61. | Which of the following disrupts homeostasis? A. Positive feedback. B. Pressure filtration. C. Thermoregulation. D. Cellular respiration. |
| 62. | Which of the following is an example of negative feedback? A. Flipping a switch turns on a light. B. Turning on the lights increases the rate of plant growth. C. Turning up a dial on the oven increases the temperature. D. The thermostat shuts off the furnace as the room temperature reaches 20 ° C. |
| 63. | A substance which helps maintain a constant pH in a solution is a(n) A. salt. B. acid. C. base. D. buffer. |
| 64. | The maintenance of a constant pH of the blood is achieved by A. acids. B. bases. C. water. D. buffers. |
| 65. | A substance that combines with excess hydrogen or hydroxide ions in a solution is called A. a salt. B. a base. C. an acid. D. a buffer. |
| 66. | The chemical reactions in the small intestine take place in a basic (alkaline) environment. Which number indicates this basic pH? A. 2.5 B. 4.6 C. 6.9 D. 8.5 |
| 67. | Some biologically-important molecules dissolve easily in water because the water molecule is A. polar. B. organic. C. saturated. D. a polymer. |
| 68. | Which of the following describes hydrolysis? A. Taking up excess hydroxide ions. B. Making a polymer by removing water. C. Making water by combining an acid and a base. D. Adding water to break a polymer into unit molecules. |
| 69. | Which substance is produced in every dehydration synthesis reaction? A. Fat. B. Water. C. Protein. D. Carbohydrate. |
| 70. | Synthesis of protein involves the bonding of amino acids to A. glucose. B. glycerol. C. peptides. D. fatty acids. |
| 71. | Which of the following is an example of denaturation? A. Water freezing. B. Sugar dissolving in water. C. Egg white forming a solid when heated. D. Butter changing from a solid to a liquid. |
| 72. | A radioactive element is sometimes used to trace the pathway of chemical reactions in the cell. If newly synthesized proteins are radioactive, the radioactive element used could be A. sodium. B. chlorine. C. nitrogen. D. potassium. |
| 73. | 1. Catalysts. 2. Building blocks of DNA. 3. Structural components of cell membrane. 4. Main source of energy in cellular respiration. Proteins act as A. 1 and 2. B. 1 and 3. C. 2 and 3. D. 3 and 4. |
| 74. | What is the ratio of hydrogen to oxygen molecules in a carbohydrate? A. 1:1 B. 1:2 C. 2:1 D. 3:1 |
| 75. | The bonding of unit molecules to produce a polysaccharide is called A. hydrolysis. B. translation. C. cellular respiration. D. dehydration synthesis. |
| 76. | Which of the following is made up of glucose molecules? A. Fats. B. DNA. C. Proteins. D. Cellulose. |
| 77. | An increase in thyroxin will have which of the following effects? A. increased CO ₂ production B. increased glycogen production C. decreased rate of ATP production D. decreased rate of glucose metabolism |
| 78. | 4. Which of the following is a polymer? A. ATP. B. Glucose. C. Glycerol. D. Cellulose. |
| 79. | Increased levels of thyroxin in the blood result in decreased levels of TSH. This is an example of A. diffusion. B. active transport. C. positive feedback. D. negative feedback |

DNA & PROTEIN SYNTHESIS

| | |
|-----|--|
| 1. | One of the functions of DNA is to A. secrete vacuoles. B. make copies of itself. C. join amino acids to each other. D. carry genetic information out of the nucleus. |
| 2. | Two sugars found in nucleic acids are A. sucrose and ribose. B. glucose and fructose. C. deoxyribose and ribose. D. deoxyribose and glucose. |
| 3. | The number of adenine bases in a DNA molecule equals the number of thymine bases because A. DNA contains equal numbers of all four bases. B. thymine always follows adenine on each DNA strand. C. DNA is made of alternating adenine and thymine bases. D. adenine on one strand bonds to thymine on the other strand. |
| 4. | Which of the following would not occur during complementary base pairing? A. A-T B. U-G C. C-G D. A-U |
| 5. | Which of the following describes a DNA molecule? A. Double helix of glucose sugars and phosphates. B. Ladder-like structure composed of fats and sugars. C. Double chain of nucleotides joined by hydrogen bonds. D. A chain of alternating phosphates and nitrogenous bases. |
| 6. | Which of the following is an example of complementary base pairing? A. Thymine – uracil. B. Guanine – adenine. C. Adenine – thymine. D. Cytosine – thymine. |
| 7. | Which of the following is the correct matching of base pairs in DNA? A. Adenine–Guanine and Thymine–Uracil. B. Guanine–Cytosine and Adenine–Uracil. C. Adenine–Thymine and Guanine–Cytosine. D. Guanine–Thymine and Adenine–Cytosine. |
| 8. | DNA replication involves the breaking of bonds between A. bases. B. sugars and bases. C. phosphates and bases. D. sugars and phosphates. |
| 9. | Which of the following statements best describes DNA replication ? A. tRNA, by complementary base pairing with mRNA, produces proteins. B. RNA nucleotides, by complementary base pairing with DNA, produce DNA. C. DNA nucleotides, by complementary base pairing with DNA, produce DNA. D. RNA nucleotides, by complementary base pairing with DNA, produce tRNA. |
| 10. | The base found in RNA nucleotides but not in DNA nucleotides is A. uracil (U). B. adenine (A). C. guanine (G). D. cytosine (C). |
| 11. | The product of transcription is A. DNA. B. protein. C. mRNA. D. a ribosome. |
| 12. | A section of DNA has the following sequence of nitrogenous bases: CGATTACAG Which of the following sequences would be produced as a result of transcription? A. CGTUUTCTG B. GCTAATGTC C. CGAUUACAG D. GCUAAUGUC |
| 13. | mRNA is produced in the process called A. respiration. B. translation. C. replication. D. transcription. |
| 14. | A function of transfer RNA (tRNA) is to A. stay in the nucleus and be copied by DNA. B. carry amino acids to the growing polypeptide chain. C. copy DNA and carry the information to the ribosome. D. read the codons and provide the site for protein synthesis. |
| 15. | Which of the following best describes the function of mRNA? A. It stays in the nucleus and is copied by DNA. B. It carries amino acids to the growing polypeptide chain. C. It makes up the ribosomes and provides the site for protein synthesis. D. It is transcribed from the DNA and carries the information to the ribosome. |
| 16. | The molecule that is responsible for carrying amino acids to ribosomes is A. DNA. B. tRNA. C. rRNA. D. mRNA. |

| | |
|-----|---|
| 17. | A polypeptide found in the cytoplasm of a cell contains 12 amino acids. How many nucleotides would be required in the mRNA for this polypeptide to be translated? A. 4 B. 12 C. 24 D. 36 |
| 18. | If the nucleotide sequence of an anticodon was AUC, then the DNA triplet would be A. ATC. B. TAG. C. AUC. D. UAG. |
| 19. | If the code for an amino acid is AGC on the DNA molecule, the anticodon on the tRNA would be A. AGC B. TGC C. UCG D. UGC |
| 20. | During protein synthesis, peptide bonds are formed at the A. nucleus. B. nucleolus. C. lysosomes. D. ribosomes. |
| 21. | Determine the sequence of amino acids produced by this DNA sequence: GGAGTTTTC A. Proline, Valine, Lysine. B. Glycine, Valine, Leucine. C. Proline, Glutamine, Lysine. D. Glycine, Glutamic acid, Leucine. |
| 22. | Use the following information to answer the question: 1. Uracil bonds with adenine. 2. Complementary bonding between codon and anticodon. 3. DNA unzips. 4. mRNA joins with ribosome. The correct order of the above during protein synthesis is A. 1, 2, 4, 3 B. 1, 3, 2, 4 C. 3, 1, 4, 2 D. 3, 2, 1, 4 |
| 23. | The tRNA anticodon for the DNA sequence AGT would be A. UCA. B. AGU. C. TCA. D. AGT. |
| 24. | A change in the sequence of bases in a strand of DNA that occurs as a result of exposure to X-rays is an example of A. mutation. B. denaturation. C. transcription. D. protein synthesis. |
| 25. | For a substance to be classified as a mutagen, it must cause A. a change in DNA. B. enzymes to denature. C. hydrolysis of proteins. D. mRNA to be produced. |
| 26. | Which of the following would be a result of the substitution of one base pair in DNA by a different base pair during replication? A. A mutation would occur. B. tRNA would bond to DNA. C. Phosphate would join with adenine. D. Uracil would appear in the DNA strand. |
| 27. | Recombinant DNA is defined as DNA produced from A. RNA and a protein. B. DNA and hemoglobin. C. viral DNA and glucose. D. DNA of two different organisms. |
| 28. | When a foreign gene is incorporated into an organism's nucleic acid, the resulting molecule is called A. ATP. B. recombinant DNA. C. transfer RNA (tRNA). D. messenger RNA (mRNA). |
| 29. | If the triplet code on a DNA molecule changes from ACT to AGC, the result is called A. mutation. B. metastasis. C. translation. D. transcription. |
| 30. | Use the following events to answer the question. 1. mRNA is formed. 2. DNA segment opens (unzips). 3. mRNA attaches to ribosomes. 4. amino acids form peptide bonds. 5. tRNA carries amino acids to mRNA. 6. The correct order of events required for protein synthesis is A. 1, 2, 3, 4, 5. B. 2, 1, 3, 4, 5. C. 2, 1, 3, 5, 4. D. 2, 1, 4, 5, 3. |
| 31. | Which of the following terms describes the process shown below? DNA → mRNA A. Unzipping. B. Translation. C. Replication. D. Transcription. |
| 32. | One of the functions of DNA is to A. secrete vacuoles. B. make copies of itself. C. join amino acids to each other. D. carry genetic information out of the nucleus. |
| 33. | A role of mRNA in protein synthesis is to A. form ribosomes. B. form the protein's tertiary structure. C. carry appropriate amino acids into place. D. carry genetic information out of the nucleus. |

THE CELL

| | |
|-----|---|
| 1. | Two functions of rough endoplasmic reticulum are to A. detoxify and transport drugs. B. modify and activate hormones. C. synthesize and transport enzymes. D. join with and hydrolyze food vacuoles. |
| 2. | In which of the following is the greatest amount of deoxyribonucleic acid (DNA) found? A. nucleus B. ribosome C. nucleolus D. nuclear envelope |
| 3. | Most of the cell membrane is made from A. steroids. B. proteins. C. phospholipids. D. polysaccharides. |
| 4. | Which organelle contains enzymes that digest old cells? A. nucleus B. ribosome C. lysosome D. Golgi body |
| 5. | Specialized vacuoles containing molecules that catalyze the hydrolysis of macromolecules are A. nucleoli. B. ribosomes. C. lysosomes. D. chromosomes. |
| 6. | An organelle composed of membranous tubules that synthesize testosterone is the A. vacuole. B. Golgi apparatus. C. rough endoplasmic reticulum. D. smooth endoplasmic reticulum. |
| 7. | The most abundant molecules in the cell membrane are A. steroids. B. proteins. C. phospholipids. D. carbohydrates. |
| 8. | A function of smooth endoplasmic reticulum is to A. form ribosomes. B. synthesize lipids. C. store nucleic acid. D. breakdown carbohydrates. |
| 9. | Which of the following contains large amounts of hydrolytic enzymes? A. Centriole. B. Ribosome. C. Nucleolus. D. Lysosome. |
| 10. | Cells which require large amounts of energy would likely contain relatively high numbers of A. centrioles. B. chloroplasts. C. Golgi bodies. D. mitochondria. |
| 11. | A function of lysosomes is A. synthesis. B. hydrolysis. C. replication. D. respiration. |
| 12. | One of the components of a cell's cytoskeleton is composed of A. plastids. B. cytoplasm. C. microtubules. D. chromosomes. |
| 13. | Which organelle functions as a storage and packaging site? A. Ribosome. B. Lysosome. C. Mitochondrion. D. Golgi apparatus. |
| 14. | An organelle composed of a stack of flattened saccules may function to A. propel the cell. B. replicate DNA. C. produce glucose. D. package proteins. |
| 15. | An organelle composed of a stack of flattened saccules may function to A. propel the cell. B. replicate DNA. C. produce glucose. D. package proteins. |
| 16. | In which one of the following organelles is light energy used to produce simple sugars? A. Lysosomes. B. Chloroplasts. C. Mitochondria. D. Endoplasmic reticulum. |
| 17. | 13. A biologist determined the surface area and volume of four cells: two flat cells with the same thickness and two spherical cells. Which of the four cells would have the greatest surface area to volume ratio? A. The small, flat cell with a volume of 5 microlitres. B. The small, spherical cell with a volume of 5 microlitres. C. The large, flat cell with a volume of 10 microlitres. D. The large, spherical cell with a volume of 10 microlitres. |
| 18. | During the metamorphosis from tadpole to frog, which of the following organelles would cause the cells of the tail of a tadpole to be broken down and digested? A. ribosomes B. lysosomes C. Golgi bodies D. endoplasmic reticulum |
| 19. | Which of the following organelles is correctly matched with its product? A. nucleolus — DNA B. mitochondria — ATP C. Golgi apparatus — lipid D. smooth endoplasmic reticulum — protein |
| 20. | Which of the following organelles breaks down dead cells? A. nucleus B. lysosome C. Golgi apparatus D. rough endoplasmic reticulum |
| 21. | For digestion to occur in a vacuole, the vacuole must first fuse with a A. nucleus. B. ribosome. C. lysosome. D. Golgi body. |

| | |
|-----|--|
| 22. | Lysosomes can be expected to be present in large numbers in cells which A. have cilia. B. produce centrioles. C. are actively dividing. D. carry out phagocytosis. |
| 23. | Which of the following is found in both prokaryotic and eukaryotic cells? A. Nucleus. B. Ribosome. C. Lysosome. D. Mitochondrion. |
| 24. | Which of the following is a component of both prokaryotic and eukaryotic cells? A. Cell wall. B. Chloroplasts. C. Golgi bodies. D. Mitochondria. |
| 25. | Bacteria are prokaryotic cells. Which of the following structures is found in both bacteria and plant cells? A. Cell wall. B. Chloroplast. C. Mitochondrion. D. Nuclear membrane. |
| 26. | During daylight hours, green plants carry on A. respiration only. B. photosynthesis only. C. respiration and fermentation. D. photosynthesis and respiration. |
| 27. | A stack of saccules that prepares secretory vesicles is known as a A. plastid. B. lysosome. C. nucleolus. D. Golgi body. |
| 28. | Prokaryotic cells are different from eukaryotic cells in that prokaryotic cells lack A. cell walls. B. ribosomes. C. mitochondria. D. cell membranes. |
| 29. | The cells that make up an organ that is active in producing steroid hormones have abundant numbers of which of the following organelles? A. Ribosomes and lysosomes. B. Chloroplasts and mitochondria. C. Nucleoli and rough endoplasmic reticulum. D. Smooth endoplasmic reticulum and Golgi bodies. |
| 30. | What is the sequence of organelles that a secreted protein would have passed through on its journey out of a cell? A. Mitochondria, Golgi apparatus, cell membrane. B. Cell membrane, mitochondria, Golgi apparatus. C. Golgi apparatus, rough endoplasmic reticulum, cell membrane. D. Rough endoplasmic reticulum, Golgi apparatus, cell membrane. |

CELL MEMBRANE & TRANSPORT

| | |
|-----|--|
| 1. | Carrier molecules that bring materials into cells are A. lipids. B. proteins. C. glycogen. D. phospholipids. |
| 2. | The fluid-mosaic membrane model describes the membrane as having a A. sheet of protein. B. phospholipid bilayer. C. sugar-phosphate backbone. D. complementary base template. |
| 3. | Molecules in the cell membrane that function as receptors are A. proteins. B. glycerol. C. cholesterol. D. phospholipids. |
| 4. | Cell membranes are composed mainly of A. sugars and phosphates. B. phospholipids and proteins. C. carbohydrates and cellulose. D. nucleotides and carbohydrates. |
| 5. | Which of these substances cannot pass through cell membranes? A. Starch. B. Glycerol. C. Amino acids. D. Monosaccharides. |
| 6. | Which of the following conditions is required for diffusion to occur? A. ATP energy. B. A living cell. C. A concentration difference. D. A selectively-permeable membrane. |
| 7. | The rate of diffusion across the cell membrane is affected by the A. temperature and pinocytosis. B. temperature and size of the molecule. C. membrane structure and phagocytosis. D. shape of glycolipids and glycoproteins. |
| 8. | Frog eggs placed in an isotonic solution will A. burst. B. shrink. C. remain the same. D. increase in volume. |
| 9. | When put in a hypotonic environment, an animal cell will A. swell. B. shrink. C. secrete enzymes. D. remain unchanged. |
| 10. | Which of the following conditions would cause red blood cells to burst? A. pH of 7.5. B. Temperature of 37°C. C. Being placed in distilled water. D. Being placed in an 11% salt solution. |
| 11. | The cytoplasmic concentration of solute in a cell is 0.05%. This cell is placed in a solution that causes the cell to swell and burst. The solute concentration of this solution is A. 0.005% B. 0.05% C. 0.5% D. 5.0% |
| 12. | In an experiment, frog's eggs were placed in a salt solution. After several hours their mass increased significantly. We can therefore conclude that, compared to the frog's eggs, the solution was A. isotonic. B. saturated. C. hypotonic. D. hypertonic. |
| 13. | A cell would tend to gain water if it were moved from A. an isotonic solution to a hypotonic solution. B. an isotonic solution to a hypertonic solution. C. a hypotonic solution to an isotonic solution. D. a hypotonic solution to a hypertonic solution. |
| 14. | If the solute concentration of solution A is greater than solution B, then solution A is said to be A. isotonic to solution B. B. osmotic to solution B. C. hypotonic to solution B. D. hypertonic to solution B. |
| 15. | Which of the following moves material against a concentration gradient? A. osmosis B. diffusion C. active transport D. facilitated transport |
| 16. | Which of the following processes moves molecules using cellular energy? A. Osmosis. B. Diffusion. C. Pinocytosis. D. Facilitated transport. |
| 17. | Which of the following processes would be directly affected by a lack of cellular ATP? A. Osmosis. B. Diffusion. C. Active transport. D. Facilitated transport. |
| 18. | Pinocytosis is accomplished by the cell using the A. nucleus. B. cell wall. C. cytoplasm. D. cell membrane. |
| 19. | The process taking when a cell engulfs larger protein molecules and internalizes them in vesicles is A. osmosis. B. exocytosis. C. phagocytosis. D. facilitated transport |
| 20. | How many of the following factors would affect the permeability of the cell membrane? • Size of molecules • Lipid solubility of molecules • Presence of transport channels • Presence of ATP inside the cell. A. One. B. Two. C. Three. D. Four. |
| 21. | Which of the following aids the movement of glucose across a cell membrane? A. Protein. B. Phosphate. C. Glycolipid. D. Cholesterol. |
| 22. | A shortage of available ATP would hinder a cell's ability to import A. water. B. protein. C. oxygen. D. carbon dioxide. |
| 23. | Which of the following will be affected directly if the mitochondria in a cell are not functioning properly? A. Absorption of alcohol by the cell. B. The movement of water into and out of the cell. C. The movement of oxygen across the cell membrane. D. The movement of sugar from a low to a high concentration. |
| 24. | A slice of potato placed in distilled water becomes firm after several hours because A. salt has passed into the potato cells. B. cellulose synthesis in the cell wall has been stimulated. C. water has passed into the potato cells causing the cells to swell. D. water has passed out of the potato cells causing the cells to shrink. |
| 25. | Glycogen is not normally found in the blood because A. free glucose molecules are stored as starch. B. free glucose molecules are converted to amino acids. C. glycogen can be structurally incorporated directly into the cell wall. D. glycogen molecules are unable to diffuse through the cell membrane. |
| 26. | The cell process which uses ATP to bring substances into the cell is A. osmosis. B. diffusion. C. active transport. D. facilitated transport. |

ENZYMES

| | |
|----|---|
| 1. | Enzymes function to increase the rate of a metabolic reaction by A. denaturing the substrate. B. adding energy to the reaction. C. decreasing the energy of activation. D. increasing the concentration of the reactants. |
|----|---|

| | |
|-----|--|
| 2. | An enzyme speeds up a chemical reaction by A. regulating pH. B. acting as a buffer. C. preventing denaturation. D. lowering the energy of activation. |
| 3. | The role of an enzyme in a chemical reaction is to A. emulsify fats. B. prevent denaturation. C. speed up the reaction. D. buffer any acids or bases. |
| 4. | Enzymes often A. absorb fatty acids. B. help in hydrolysis reactions. C. serve as a long term source of energy. D. serve as the structural framework of cell walls. |
| 5. | In the cell, enzymes act as A. buffers. B. catalysts. C. neurotransmitters. D. emulsifying agents. |
| 6. | Enzymes consist of chains of A. fatty acids. B. nucleotides. C. amino acids. D. carbohydrates. |
| 7. | Compounds that are needed for enzymes to function properly are A. buffers. B. steroids. C. vitamins. D. heavy metals. |
| 8. | A non-protein molecule that aids the action of an enzyme to which it is loosely bound is called a(n) A. initiator. B. coenzyme. C. competitive inhibitor. D. enzyme-substrate complex. |
| 9. | The area of an enzyme into which a substrate fits is called the A. catalyst. B. product. C. active site. D. activated complex. |
| 10. | The molecule that fits into the enzyme's active site is the A. codon. B. vitamin. C. substrate. D. coenzyme. |
| 11. | The active site of an enzyme is A. formed by the substrate. B. altered by heavy metals. C. altered by the substrate concentration. D. destroyed during its reaction with a substrate. |
| 12. | High concentrations of thyroxin in the blood will cause metabolic reactions in a cell to A. speed up. B. slow down. C. stop occurring. D. remain unchanged. |
| 13. | Why would drugs like penicillin destroy bacteria but have no effect on human cells? A. Human enzymes would be denatured by penicillin. B. Bacterial cells would use penicillin as a coenzyme. C. Penicillin would fit the active site of bacterial enzymes. D. Enzymes in human cells would use penicillin to produce excess energy. |
| 14. | Thyroxin treatment can be used to stimulate weight loss in some people with an endocrine deficiency. This treatment will A. cause a loss of appetite. B. increase the metabolic rate. C. prevent the conversion of fatty acids to fat. D. accelerate the conversion of glucose to glycogen. |
| 15. | The pituitary gland secretes a hormone into the bloodstream which stimulates the production of thyroxin. In turn, production of thyroxin is inhibited by A. the effect of thyroxin on the adrenal gland. B. the effect of thyroxin on the pituitary gland. C. decreasing the amount of calcium in the diet. D. increasing the amount of iodine in the blood. |
| 16. | The tertiary structure of an enzyme is A. its helical orientation in space. B. its three-dimensional, globular shape. C. the particular sequence of amino acids. D. the arrangement of several proteins to create a functional unit. |
| 17. | A reaction catalyzed by a human enzyme was carried out at 20°C. If there is an excess of substrate, which of the following would cause the greatest increase in the rate of the reaction? A. Lowering the temperature to 10°C. B. Adding more enzyme and raising the temperature to 30°C. C. Adding more substrate and raising the temperature to 30°C. D. Adding more enzyme and lowering the temperature to 10°C. |

DIGESTION & HUMAN ORGANIZATION

| | |
|-----|---|
| 1. | Tissue lining the esophagus is A. nervous. B. muscular. C. epithelial. D. connective. |
| 2. | Which of the following is a connective tissue? A. Skin. B. Brain. C. Blood. D. Muscle. |
| 3. | Similar cells which are joined together form A. a tissue. B. an organ. C. cytoplasm. D. an organ system. |
| 4. | Tissues that hold structures together and provide support and protection are A. nerve tissues. B. epithelial tissues. C. epidermis tissues. D. connective tissues. |
| 5. | 1. Organ 2. Cell 3. Organ system 4. Tissue From left to right, the sequence that represents increasing complexity is A. 1, 3, 2, 4 B. 2, 1, 3, 4 C. 2, 4, 1, 3 D. 2, 4, 3, 1 |
| 6. | Blood is a type of A. nervous tissue. B. epithelial tissue. C. muscular tissue. D. connective tissue. |
| 7. | Digestion is defined as the process whereby A. glucose is converted to glycogen. B. carbon dioxide is reduced to carbohydrate. C. proteins are absorbed into the bloodstream. D. food is chemically and physically broken down. |
| 8. | Which of the following describes peristalsis? A. the physical breakdown of fats B. production of vitamins by <i>E. coli</i> C. release of enzymes by the pancreas D. muscle contractions of the digestive tract |
| 9. | A patient complains of a burning sensation in the chest. This was found to be caused by gastric juice in the esophagus. The structure most likely not functioning properly is the A. pharynx. B. epiglottis. C. pyloric sphincter. D. cardiac sphincter. |
| 10. | Chewing food aids digestion by A. stimulating the release of bile. B. increasing the surface area of the food. C. breaking up large protein molecules into peptides. D. completing the chemical breakdown of carbohydrates. |
| 11. | The purpose of physical digestion is to A. hydrolyze large molecules. B. increase the amount of feces. C. increase the surface area of food. D. slow the action of digestive enzymes. |
| 12. | The purpose of physical digestion is to A. hydrolyze large molecules. B. increase the amount of feces. C. increase the surface area of food. D. slow the action of digestive enzymes. |
| 13. | Which of the following structures prevents food from entering the trachea? A. Larynx. B. Pharynx. C. Epiglottis. D. Cardiac sphincter. |
| 14. | The part of the digestive tract where starch first undergoes chemical digestion is the A. mouth. B. stomach. C. large intestine. D. small intestine. |
| 15. | Saliva contains an enzyme that partially digests A. fat. B. starch. C. protein. D. nucleic acids. |
| 16. | Eating which of the following would slow the rate of chemical digestion in the mouth? A. Cheese. B. Ice cream. C. Potato chips. D. Bread with butter. |
| 17. | Which of the following is required to convert pepsinogen into pepsin? A. Mucus secretions. B. Hydrochloric acid. C. Sodium bicarbonate. D. Lipid in the stomach. |
| 18. | A role of hydrochloric acid in the stomach is to A. kill bacteria. B. hydrolyze fat. C. digest protein. D. activate trypsin. |
| 19. | Sodium bicarbonate (NaHCO_3) in pancreatic juice A. emulsifies fats. B. activates pepsin. C. neutralizes acid chyme. D. stimulates the release of insulin. |
| 20. | Which of the following would inhibit trypsin's ability to form an enzyme-substrate complex? A. pH of 3. B. Temperature of 37°C. C. Increased bile production. D. Decreased numbers of villi. |
| 21. | Which of the following is not a function of pancreatic juice? A. Raising pH. B. Emulsifying. C. Starch digestion. D. Protein digestion. |
| 22. | Which of the following is a function of pancreatic juice? A. lowering pH. B. Emulsifying. C. fat digestion. D. Protein absorption. |

| | |
|-----|---|
| 23. | If sodium bicarbonate (NaHCO ₃) is not released as part of the pancreatic juice, the pH of the A. stomach will remain basic. B. pancreas will become acidic. C. large intestine will become basic. D. small intestine will remain acidic. |
| 24. | Pancreatic juices are A. basic. B. acidic. C. the source of secretin. D. unnecessary for the digestion of fat. |
| 25. | The chemical digestion of fats is a result of the release of secretions from the A. pancreas. B. gall bladder. C. small intestine. D. salivary glands. |
| 26. | Trypsin functions best in which of the following conditions? A. basic B. acidic C. neutral D. low pH |
| 27. | Which organ has a large surface area and has special adaptations for the absorption of fats? A. mouth B. stomach C. esophagus D. small intestine |
| 28. | Peristalsis in the esophagus A. moves food to the stomach. B. opens the pyloric sphincter. C. activates the salivary glands. D. causes the secretion of pepsinogen. |
| 29. | The function of the pyloric sphincter is to prevent the backflow of material from the A. esophagus to the mouth. B. duodenum to the stomach. C. stomach to the esophagus. D. colon to the small intestine. |
| 30. | A function of the small intestine is to A. secrete bile. B. filter wastes. C. make vitamins. D. absorb nutrients. |
| 31. | Which of the following enzymes is correctly matched with its site of production? A. Pepsin – liver. B. Lipase – stomach. C. Amylase – pancreas. D. Trypsin – salivary glands. |
| 32. | The enzyme amylase is produced by which organs? A. Liver and duodenum. B. Duodenum and pancreas. C. Salivary glands and liver. D. Pancreas and salivary glands. |
| 33. | Which pair of enzymes have similar substrates? A. Pepsin and trypsin. B. Pepsin and maltase. C. Amylase and lipase. D. Maltase and peptidase. |
| 34. | Which of the following carries out chemical digestion? A. Insulin. B. Gastrin. C. Trypsin. D. Secretin. |
| 35. | An example of absorption is the A. movement of food by peristalsis. B. active transport of glucose into a villus. C. hydrolysis of a peptide into amino acids. D. release of secretin in the presence of HCl. |
| 36. | Which of the following is an example of physical digestion? A. Hydrolysis. B. Release of gastrin. C. Churning in the stomach. D. Action of lipase in the small intestine. |
| 37. | The presence of large numbers of mitochondria in the cells lining the small intestine allows it to A. release HCl. B. produce bile. C. absorb glucose. D. synthesize vitamins. |
| 38. | Which of the following enzymes is correctly matched with its source? A. Amylase – stomach. B. Peptidase – pancreas. C. Trypsin – small intestine. D. Maltase – small intestine. |
| 39. | Structures of the small intestine that aid in the absorption of nutrients include A. villi. B. cilia. C. <i>E. Coli</i> . D. sphincters. |
| 40. | High levels of toxins in the blood may indicate a problem with the function of the A. liver. B. stomach. C. pancreas. D. small intestine. |
| 41. | The liver plays vital roles in all of the following systems except the A. nervous system. B. digestive system. C. excretory system. D. circulatory system. |
| 42. | Vitamins and amino acids are produced in the large intestine by A. feces. B. bacteria. C. the cells of the villi. D. the reabsorption of water. |
| 43. | A function of the liver is to A. produce glucagon. B. break down blood cells. C. regulate sodium and potassium levels. D. secrete enzymes into the small intestine. |
| 44. | Products of the liver include A. pepsin, gastrin and bile. B. bile, proteases and urea. C. bile, urea and blood proteins. D. proteases, amylases and lipase. |
| 45. | If a person's liver fails, which process listed below would stop? A. Digestion of proteins. B. Destruction of red blood cells. C. Storage of starch between meals. D. Reabsorption of water from the digestive tract. |
| 46. | The emulsification of fats is a result of the release of secretions from the A. pancreas. B. gall bladder. C. small intestine. D. salivary glands. |
| 47. | The emulsification of fat is carried out by A. bile. B. lipase. C. pepsin. D. bicarbonate ions. |
| 48. | Bile causes the emulsification of A. lipids. B. proteins. C. nucleic acids. D. carbohydrates. |
| 49. | People who have their gall bladder removed have the most difficulty digesting A. butter. B. apples. C. vitamins. D. egg whites. |
| 50. | The gall bladder functions to A. store bile. B. digest fats. C. store urine. D. release sodium bicarbonate. |
| 51. | Emulsification of fat is the function of A. bile. B. lipase. C. pepsin. D. sodium bicarbonate (NaHCO ₃). |
| 52. | Removal of the gall bladder would affect a person's ability to digest A. lipids. B. sugars. C. proteins. D. carbohydrates. |
| 53. | The release of cholecystokinin (CCK) would most likely be triggered after a meal of A. fruit. B. meat. C. bread. D. lettuce. |
| 54. | One function of the lymphatic system is to A. deliver oxygen to body tissues. B. store fluids during dehydration. C. absorb fats from the digestive system. D. carry platelets to sites of vessel injury. |
| 55. | Lacteals primarily absorb A. lipids. B. proteins. C. minerals. D. carbohydrates. |
| 56. | Bile is released as a result of A. gastrin entering the blood. B. sympathetic nerves being stimulated. C. the duodenum secreting CCK (cholecystokinin). D. the presence of carbohydrates in the digestive tract. |
| 57. | Which of the following supports the idea that the secretion of enzymes from the pancreas is controlled by hormones? A. The sight and smell of food causes the pancreas to secrete enzymes. B. If the nerves leading to the pancreas are cut, no enzymes are secreted. C. If there is no food in the stomach, the pancreas will not secrete enzymes. D. If the nerves leading to the pancreas are cut and weak acid is placed in the intestine, the pancreas secretes enzymes. |
| 58. | The secretion of cholecystokinin (CCK) will be stimulated by the presence of A. polypeptides and glucose. B. partially digested protein and fats. C. partially digested starch and water. D. completely digested carbohydrates and water. |
| 59. | What would occur if sodium bicarbonate ions were removed from pancreatic juice? A. Decreased amounts of bile would be released. B. Increased H ₂ O absorption would occur in the colon. C. The cells lining the small intestine would be damaged. D. Digestion of nutrients in the small intestine would increase. |
| 60. | The absorption of water from the digestive tract occurs mainly in the A. colon. B. kidneys. C. stomach. D. duodenum. |
| 61. | Populations of <i>E. coli</i> are found in the A. liver. B. colon. C. pancreas. D. gall bladder. |
| 62. | The main source of energy for the body's metabolic processes comes from the breakdown of A. lipids. B. proteins. C. nucleic acids. D. carbohydrates. |
| 63. | Which of the following are absorbed into the lymphatic system from the small intestine? A. Lipids. B. Nucleotides. C. Amino acids. D. Monosaccharides. |
| 64. | Absorption of most nutrients from the digestive tract occurs in the A. liver. B. stomach. C. pancreas. D. small intestine. |

| | |
|-----|---|
| 65. | An example of absorption is the A. movement of food by peristalsis. B. active transport of glucose into a villus. C. hydrolysis of a peptide into amino acids. D. release of secretin in the presence of HCl. |
| 66. | <i>E. coli</i> are beneficial to humans because they A. convert pepsinogen to pepsin. B. produce vitamins and amino acids. C. absorb water from the large intestine. D. synthesize urea from the breakdown of amino acids. |
| 67. | In humans, the bacteria <i>E. coli</i> are normally found within the A. colon. B. mouth. C. pancreas. D. small intestine. |
| 68. | • colon • pancreas • gall bladder • small intestine • salivary glands How many of the structures above produce enzymes that digest carbohydrates? A. two B. three C. four D. five |
| 69. | Which organelles are found in greater amounts in a cell that produces enzymes for the digestion of starches? A. Golgi bodies and nuclei B. lysosomes and smooth endoplasmic reticulum C. Golgi bodies and rough endoplasmic reticulum D. smooth endoplasmic reticulum and mitochondria |
| 70. | Which two enzymes break down the same substrate? A. trypsin and pepsin B. pepsin and peptidase C. lipase and salivary amylase D. pancreatic amylase and maltase |
| 71. | Increasing the secretion of insulin would have which of the following effects? A. decreased blood sugar B. decreased metabolic rate C. increased protein synthesis D. increased digestion of carbohydrate |
| 72. | When salivary amylase enters the stomach, it becomes A. basic. B. buffered. C. activated. D. denatured. |
| 73. | Which of the following correctly matches a digestive enzyme with its source? A. Pepsin / pancreas. B. Bile / gall bladder. C. Trypsin / stomach. D. Amylase / pancreas. |
| 74. | Secretions from the salivary glands catalyze which of the following reactions? A. protein → H ₂ O → peptides B. peptides → H ₂ O → amino acids C. carbohydrates → H ₂ O → maltose D. fats → H ₂ O → fatty acids and glycerol |
| 75. | Which of the following would prevent maltase from forming an enzyme-substrate complex? A. pH of 8.5 B. a competitive inhibitor C. increased production of bile D. an increase in substrate concentration |
| 76. | Two glands that are responsible for secreting protein-digesting enzymes are A. salivary and gastric. B. gastric and pancreas. C. thyroid and pancreas. D. intestinal and thyroid. |
| 77. | Blood glucose levels are lowered by insulin because it stimulates A. gluconeogenesis. B. the uptake of glucose by cells. C. the conversion of glucose to fatty acids. D. the conversion of glucose to amino acids. |
| 78. | Amylase is synthesized at the A. nucleus. B. ribosome. C. lysosome. D. mitochondrion. |
| 79. | The following events take place after eating a protein-rich meal. 1. The pancreas releases sodium bicarbonate(NaHCO ₃). 2. Pepsinogen is converted into pepsin. 3. Gastrin is released into the bloodstream. 4. Acid chyme stimulates the release of secretin. Place these events in the correct order for digestion. A. 3, 2, 4, 1. B. 3, 4, 2, 1. C. 4, 2, 3, 1. D. 2, 4, 1, 3. |
| 80. | Difficulty in absorbing glucose could indicate malfunctioning of the A. colon. B. stomach. C. gall bladder. D. small intestine. |
| 81. | The main source of energy in food is A. proteins. B. vitamins. C. nucleic acids. D. carbohydrates. |
| 82. | Bread that has been partially digested by saliva tends to have a sweet taste. Which enzyme and substrate are involved? A. Pepsin and starch. B. Pepsin and protein. C. Amylase and starch. D. Amylase and protein. |
| 83. | The digestion of starch is catalyzed by a polymer made up of A. fatty acids. B. nucleotides. C. amino acids. D. monosaccharides. |
| 84. | In a demonstration, 10 grams of raw meat were suspended in an enzyme solution. After several hours the meat was weighed and was found to have a mass of 3 grams. The solution most likely contained A. bile. B. pepsin. C. maltase. D. amylase. |
| 85. | The role of bile during digestion is to A. stimulate the release of glycogen. B. hydrolyze neutral fats into fatty acids. C. catalyze the breakdown of peptides into amino acids. D. break fat into droplets thereby increasing surface area. |
| 86. | Abnormal liver function in humans affects the digestion of A. fats. B. sugars. C. proteins. D. starches. |
| 87. | Glucose levels in the blood are lowered by the hormone A. insulin. B. glucagon. C. oxytocin. D. cholecystokinin (CCK). |
| 88. | Which of the following enzymes is correctly matched with its substrate? A. Amylase—fat B Lipase—starch. C. Pepsin—protein. D. Trypsin—glycogen. |
| 89. | A piece of stomach wall is grafted into the skin of a mammal. The presence of food in the stomach causes this patch of stomach wall on the skin to produce gastric juices. This is evidence that the secretion of gastric juice is most likely brought about by A. peristalsis. B. nervous stimulation. C. the secretion of a hormone. D. mechanical stimulation of the stomach wall |
| 90. | Which of the following is a function of insulin? A. Initiating the 'fight or flight' response. B. Decreasing glucose concentration in the blood. C. Increasing the calcium ions concentration in the blood. D. Decreasing the sodium ions concentration in the blood |

CIRCULATORY SYSTEM

| | |
|-----|--|
| 1. | Which type of blood vessel has thick walls in order to withstand high pressure? A. vein B. artery C. arteriole D. capillary |
| 2. | Use the following characteristics to answer the question: • one-way valves • thin elastic layer • near skeletal muscle These characteristics describe which type of vessel? A. vein B. artery C. arteriole D. capillary |
| 3. | Blood vessels that allow diffusion of gases through their thin walls are the A. arteries. B. venules. C. arterioles. D. capillaries. |
| 4. | The main function of capillaries is to A. return blood to the heart. B. prevent the backflow of blood. C. take blood away from the heart. D. exchange nutrients and wastes with tissues. |
| 5. | Which of the following blood vessels has a thin elastic layer? A. Aorta. B. Pulmonary artery. C. Posterior vena cava. D. Mesenteric capillary. |
| 6. | Capillary beds are equipped with sphincter muscles in order to A. prevent the backflow of blood. B. expand and recoil with each heart beat. C. divert blood toward areas of increased metabolic activity. D. hold blood in the beds until nutrient and waste exchange is complete. |
| 7. | Which of the following best describes a vein? A. Thin-walled, elastic, and equipped with valves. B. Thick-walled, elastic, and equipped with valves. C. Thin-walled, muscular, and supplied with nerves. D. Thick-walled, muscular, and supplied with nerves. |
| 8. | The function of an artery is to A. transport blood toward the heart. B. transport blood away from the heart. C. connect the right and left atria directly. D. carry carbon dioxide to the tissue cells. |
| 9. | A blood vessel that transports blood out of a capillary bed is a(n) A. vein. B. artery. C. venule. D. arteriole. |
| 10. | The most muscular chamber of the heart is the A. left atrium. B. right atrium. C. left ventricle. D. right ventricle. |

| | |
|-----|---|
| 11. | Based on its function, the heart is often referred to as a “double pump”. Which of the following would explain this? A. The heart has two sets of valves. B. The heart is controlled by both nerves and hormones. C. The heart moves blood through two circulatory pathways. D. The heart moves blood containing both nutrients and wastes. |
| 12. | The structures attached to the atrioventricular valves are called A. atria. B. pulmonary veins. C. semilunar valves. D. chordae tendineae. |
| 13. | The main function of the valves in the heart is to A. prevent back-flow of blood. B. divide the heart into four chambers. C. control the volume of blood leaving the heart. D. control the volume of blood entering the heart. |
| 14. | Blood leaves the right ventricle via the A. aorta. B. pulmonary trunk. C. coronary arteries. D. anterior vena cava. |
| 15. | An irregular heartbeat where contraction of the atria does not always result in contraction of the ventricles, likely indicates a problem with the A. SA node. B. AV node. C. AV valve. D. semi-lunar valve. |
| 16. | A condition called tachycardia exists when a person’s heartrate is abnormally high. Which of the following explains how tachycardia may arise? A. The Purkinje fibres are over-stimulating the pacemaker. B. The sinoatrial (SA) node is receiving increased stimulation. C. There is increased stimulation by the parasympathetic nervous system. D. Impulses from the sinoatrial (SA) node are not reaching the atrioventricular (AV) node. |
| 17. | The atrioventricular (AV) node stimulates the A. aorta. B. Purkinje fibers. C. sinoatrial (SA) node. D. atrioventricular valves. |
| 18. | The coordinating structure responsible for an intrinsic heart beat is the A. cerebellum. B. sinoatrial node. C. chordae tendineae. D. sympathetic nervous system. |
| 19. | What happens during atrial diastole? A. Atria fill with blood. B. Semi-lunar valves close. C. Ventricles fill with blood. D. Atrioventricular valves open. |
| 20. | Use the following information to answer the question. 1. Systole of the ventricles. 2. Opening of the atrio-ventricular valves. 3. Electrical impulse sent from the SA node. 4. Atria fill with blood. The order in which the events above occur during one heartbeat (the cardiac cycle) is A. 2, 1, 3, 4 B. 2, 3, 4, 1 C. 4, 1, 3, 2 D. 4, 3, 2, 1 |
| 21. | The blood vessels that carry blood to and from the head are the A. iliac arteries and veins. B. subclavian arteries and veins. C. carotid arteries and jugular veins. D. anterior (superior) and posterior (inferior) vena cavae. |
| 22. | The path followed by blood on one circuit through the heart is A. ventricle, atrioventricular valve, semilunar valve, atrium. B. atrium, atrioventricular valve, ventricle, semilunar valve. C. atrium, ventricle, atrioventricular valve, semilunar valve. D. atrium, semilunar valve, ventricle, atrioventricular valve. |
| 23. | Which of the following is a characteristic of pulmonary circulation? A. Blood leaves the heart via the aorta. B. Blood in the arteries is deoxygenated. C. Blood in the veins is travelling to the lungs. D. Blood in capillaries absorbs high levels of carbon dioxide. |
| 24. | The blood vessel that carries blood from the lungs to the heart is the A. coronary vein. B. coronary artery. C. pulmonary vein. D. pulmonary artery. |
| 25. | Blood leaves the liver by way of the A. iliac vein. B. renal vein. C. hepatic vein. D. hepatic portal vein. |
| 26. | Blood with a high oxygen concentration can be found in both the A. renal artery and the pulmonary artery. B. umbilical vein and the pulmonary vein. C. pulmonary vein and the umbilical artery. D. pulmonary artery and the umbilical artery. |
| 27. | Which of the following is a characteristic of systemic circulation? A. Highly oxygenated arterial blood. B. Highly oxygenated venous blood. C. Increased blood pressure in the veins. D. Decreased blood pressure in the arteries. |
| 28. | A red blood cell leaves the aorta, makes a circuit through the body and arrives back in the capillaries of the alveoli. The correct sequence of organs through which the cell may have travelled is A. lungs, heart, small intestine, liver. B. small intestine, heart, liver, lungs. C. liver, lungs, small intestine, heart. D. small intestine, liver, heart, lungs. |
| 29. | Which of the following would describe the path of the blood in the pulmonary circuit? A. Right ventricle → pulmonary trunk → pulmonary vein → left atrium. B. Left ventricle → pulmonary vein → pulmonary trunk → right atrium. C. Right ventricle → pulmonary vein → pulmonary artery → left atrium. D. Right atrium → pulmonary trunk → aorta → vena cava → right atrium. |
| 30. | The correct path of blood from the heart to the head and back to the heart again is A. right ventricle, vena cava, carotid artery, jugular vein, left atrium. B. left ventricle, aorta, jugular vein, vena cava, carotid artery, right atrium. C. left ventricle, aorta, carotid artery, jugular vein, vena cava, right atrium. D. right atrium, carotid artery, aorta, jugular vein, vena cava, left ventricle. |
| 31. | The artery that provides oxygen and nutrients to heart tissue is the A. carotid. B. systemic. C. coronary. D. pulmonary. |
| 32. | In which of the following vessels would blood contain the highest concentration of carbon dioxide? A. Aorta. B. Carotid artery. C. Pulmonary vein. D. Pulmonary artery. |
| 33. | Which of the following is a characteristic of systemic circulation? A. Highly oxygenated arterial blood. B. Increased blood pressure in the veins. C. Low carbon dioxide concentration in the veins. D. Increased concentration of reduced hemoglobin (HHb) in the arterial blood. |
| 34. | A red blood cell is located in an artery in your right arm. How many capillary beds must this cell pass through before it is returned to the left ventricle? A. one B. two C. three D. four |
| 35. | An increase in which of the following would cause hypotension? A. heart rate B. cardiac output C. arteriole dilation D. reabsorption of water by the kidneys |
| 36. | Hypertension would be indicated by a blood pressure reading of A. 100 / 80 B. 120 / 50 C. 120 / 80 D. 150 / 110 |
| 37. | Which of the following is normal resting systolic blood pressure for an adult? A. 50 mm Hg B. 80 mm Hg C. 120 mm Hg D. 180 mm Hg |
| 38. | Blood pressure will be at its highest when A. atria relaxes. B. atria contracts. C. ventricles relax. D. ventricles contract. |
| 39. | The highest blood pressure in the aorta occurs when the A. atria contract. B. heart muscle is relaxed. C. blood is pushed to the ventricle. D. blood is pumped from the heart. |
| 40. | The highest blood pressure in the aorta occurs when the A. atria contract. B. heart muscle is relaxed. C. blood is pushed to the ventricle. D. blood is pumped from the heart. |
| 41. | Capillary beds are equipped with sphincter muscles in order to A. prevent the backflow of blood. B. expand and recoil with each heart beat. C. divert blood toward areas of increased metabolic activity. D. hold blood in the beds until nutrient and waste exchange is complete. |
| 42. | The function of the nodes in the lymphatic system is to A. filter debris. B. produce platelets for clotting. C. break down worn-out red blood cells. D. help maintain a constant blood pressure. |
| 43. | Blood capillaries and lymph capillaries both A. filter bacteria. B. have one-way valves. C. contain red blood cells. D. have walls which are one-cell thick. |
| 44. | Lymph enters the circulatory system at the A. jugular vein. B. umbilical vein. C. subclavian vein. D. pulmonary vein. |
| 45. | Which of the following is not found in the lymphatic system? A. Veins. B. Nodes. C. Arteries. D. Capillaries. |

| | |
|-----|--|
| 46. | Which of the following would occur as a result of the oval opening in the heart remaining open after birth? A. Blood pressure in the lungs would increase. B. Impulses from the sinoatrial (SA) node would stop. C. Blood in the right atrium would mix with blood in the left atrium. D. A greater amount of blood would flow into the pulmonary system. |
| 47. | Which of the following structures in fetal circulation functions to deliver blood, which is high in waste, to the placenta? A. Venous duct. B. Umbilical vein. C. Pulmonary veins. D. Umbilical arteries. |
| 48. | Which of the following structures in fetal circulation functions to deliver blood, which is high in waste, to the placenta? A. Venous duct. B. Umbilical vein. C. Pulmonary veins. D. Umbilical arteries. |
| 49. | How do the oxygen and nutrient levels in the adult vena cava compare to those levels in the fetal vena cava? A. The fetal oxygen and nutrient levels are higher. B. The adult oxygen and nutrient levels are higher. C. The fetal nutrient levels are higher, while the oxygen levels are lower. D. The adult nutrient levels are higher, while the oxygen levels are lower. |
| 50. | The function of the cardiac sphincter is to prevent backflow of acid chyme from the A. esophagus to the mouth. B. stomach to the esophagus. C. duodenum to the stomach. D. colon to the small intestine. |
| 51. | The sequence of structures through which the nerve impulse passes to cause contraction of the heart is A. AV node – SA node – Purkinje fibres. B. Purkinje fibres – AV node – SA node. C. Purkinje fibres – SA node – AV node. D. SA node – AV node – Purkinje fibres. |
| 52. | Thick walls, elastic tissue and smooth muscle are characteristics of A. veins. B. arteries. C. arterioles. D. capillaries. |
| 53. | Blockages in which of the following blood vessels reduces blood flow to the heart muscle? A. Aorta. B. Carotid artery. C. Coronary artery. D. Pulmonary artery. |
| 54. | A blood vessel which has numerous valves is a(n) A. vein. B. artery. C. arteriole. D. capillary. |
| 55. | High blood pressure can be the result of A. decreased blood volume. B. increased sodium absorption. C. decreased aldosterone release. D. increased opening of capillary beds. |
| 56. | Which of the following blood vessels provides nutrients to the heart tissue? A. Aorta. B. Carotid artery. C. Coronary artery. D. Inferior vena cava. |
| 57. | The SA node (pacemaker) of the heart is located in the wall of the A. left atrium. B. right atrium. C. left ventricle. D. right ventricle. |

BLOOD

| | |
|-----|---|
| 1. | Which of the following is a function of red blood cells? A. clot blood B. carry oxygen C. fight infection D. regulate osmotic pressure |
| 2. | The major component of human blood is A. plasma. B. platelets. C. red cells. D. white cells. |
| 3. | Use the following information to answer the question: • transport gases • maintain body temperature • protect the body against blood loss • produce hormones that stimulate metabolism • carry digestive enzymes to the small intestine How many of these are functions of the blood? A. two B. three C. four D. five |
| 4. | A foreign substance that stimulates an immune response is a(n) A. cancer. B. antigen. C. antibody. D. promoter. |
| 5. | Which of the following correctly matches structure with function? A. platelets — provide immunity B. plasma proteins — carry oxygen C. red blood cells — carry carbon dioxide D. white blood cells — initiate blood clotting |
| 6. | Plasma is composed mostly of A. salt. B. water. C. protein. D. hormones. |
| 7. | All of the following are components of plasma except A. salts. B. water. C. proteins. D. platelets. |
| 8. | Red blood cells originate in the A. liver. B. lymph nodes. C. bone marrow. D. capillary beds. |
| 9. | The main function of platelets is to A. fight disease. B. carry oxygen. C. carry nutrients. D. aid in blood clotting. |
| 10. | An important function of white blood cells is to A. buffer blood. B. carry oxygen. C. fight infection. D. carry carbon dioxide. |
| 11. | Blood proteins are made in the A. liver. B. kidney. C. stomach. D. pancreas. |
| 12. | Blood which lacks platelets would not be able to A. clot. B. carry oxygen. C. fight infections. D. transport nutrients. |
| 13. | Blood which lacks platelets would not be able to A. clot. B. carry oxygen. C. fight infections. D. transport nutrients. |
| 14. | Use the following information to answer the question 1. Calcium activates an enzyme. 2. Fibrin binds platelets to form a “plug.” 3. Thrombin converts fibrinogen to fibrin. 4. Platelets and damaged cells release an activator. The correct sequence of events leading to the formation of a blood clot is A. 1, 2, 3, 4. B. 2, 1, 3, 4. C. 3, 4, 1, 2. D. 4, 1, 3, 2. |
| 15. | Which of the following is directly involved in the conversion of prothrombin to thrombin? A. Fibrin. B. Carbonic anhydrase. C. Calcium ions (Ca ²⁺) D. Magnesium ions (Mg ²⁺) |
| 16. | Arrange the following steps in the sequence which occurs during an inflammatory reaction. 1. Pus forms at injury site. 2. Damaged cells release histamines. 3. Increased permeability of the capillary wall. 4. Swelling and redness at injury site. A. 1, 2, 4, 3 B. 2, 1, 3, 4 C. 2, 3, 4, 1 D. 3, 4, 2, 1 |
| 17. | Arrange the following steps in the sequence which occurs during an inflammatory reaction. 1. Pus forms at injury site. 2. Damaged cells release histamines. 3. Increased permeability of the capillary wall. 4. Swelling and redness at injury site. A. 1, 2, 4, 3 B. 2, 1, 3, 4 C. 2, 3, 4, 1 D. 3, 4, 2, 1 |
| 18. | What occurs when an antigen enters the body? A. There is increased platelet production. B. Red blood cells phagocytize the antigen. C. Antibodies change shape to fit the antigen. D. Specific antibodies are produced and released. |
| 19. | The presence of bacteria in the blood will cause the body to produce A. mucus. B. antigens. C. antibodies. D. hydrochloric acid. |
| 20. | Rapid production of lymphocytes in the lymph nodes would indicate the presence of A. an infection. B. hypotension. C. hypertension. D. capillary fluid exchange. |
| 21. | A foreign substance entering the circulatory system is called a(n) A. platelet. B. antigen. C. antibody. D. hormone. |
| 22. | A person with type AB blood has A. A antigens and B antibodies. B. both A and B antigens and A and B antibodies. C. no A or B antigens but both A and B antibodies. D. both A and B antigens but no A or B antibodies. |
| 23. | Which of the following blood transfusions is compatible? A. Donor type A and recipient type O. B. Donor type A and recipient type B. C. Donor type O and recipient type B. D. Donor type AB and recipient type O. |
| 24. | Erythroblastosis could occur when a second or third child is born to which of the following couples? A. Rh positive male and Rh positive female. B. Rh negative male and Rh positive female. C. Rh positive male and Rh negative female. D. Rh negative male and Rh negative female. |
| 25. | An Rh negative mother is pregnant for the first time with an Rh positive fetus. Just prior to birth some fetal blood cells cross the placenta into the mother. Which of the following will occur? A. The fetus will die before birth. B. The mother will become Rh positive. C. The mother will produce Rh antibodies. D. The fetal red blood cells will become Rh negative. |

| | |
|-----|--|
| 26. | Which chamber of the heart pumps oxygenated blood into the aorta? A. left atrium B. right atrium C. left ventricle D. right ventricle |
| 27. | Use the following information to answer the question 1. Vesicle fuses with a lysosome. 2. Bacterium is taken into the macrophage. 3. Digestion of the bacterium occurs. 4. Vesicle is formed around the bacterium. Which of the following is the correct sequence to describe what happens to a bacterium after a type of white blood cell called a macrophage encounters it? A. 1, 3, 2, 4 B. 1, 4, 2, 3 C. 2, 3, 4, 1 D. 2, 4, 1, 3 |
| 28. | Which of the following would increase the rate of a metabolic reaction in the mouth? A. Adding lead ions. B. Increasing the pH to 12. C. Decreasing the temperature to 10 °C. D. Increasing the enzyme concentration. |
| 29. | Which of the following organs has a portal system associated with it? A. Skin. B. Lung. C. Liver. D. Heart. |
| 30. | The osmotic return of fluid from the tissues to the blood occurs at the A. arterioles. B. lymph veins. C. capillary bed. D. subclavian vein. |
| 31. | The vein carrying the highest concentration of oxygen is the A. iliac. B. renal. C. hepatic. D. pulmonary. |
| 32. | Red blood cells are formed by A. muscle tissue. B. nervous tissue. C. epithelial tissue. D. connective tissue. |
| 33. | When blood enters a vein from a venule, the blood pressure will A. increase because of increased heart rate. B. decrease because of increased vessel diameter. C. increase because of stretch receptor stimulation. D. remain constant due to the steady pumping of the heart. |
| 34. | A substance that combines with calcium in the blood may affect the circulatory system's ability to A. fight infection. B. maintain blood pressure. C. transport oxygen to tissues. D. clot blood at damaged sites. |
| 35. | Which of the following are needed to begin blood clotting? A. Red cells and platelets. B. White cells and red cells. C. Platelets and plasma proteins. D. White cells and plasma proteins. |
| 36. | A person complains of constant fatigue and a lack of energy. The most likely cause of these symptoms is not enough A. fibrin. B. calcium. C. histamine. D. hemoglobin. |

RESPIRATORY SYSTEM

| | |
|-----|--|
| 1. | Blood reaches the lungs from the heart through the A. aorta. B. pulmonary vein. C. pulmonary arteries. D. superior vena cava. |
| 2. | Mucus is moved along the respiratory tract by A. cilia. B. flagella. C. peristalsis. D. active transport. |
| 3. | An increase in the rate of contractions of the diaphragm and rib muscles would indicate A. decreased hydrogen ion concentration. B. decreased reduced hemoglobin in the blood. C. increased concentration of bicarbonate ion in the blood. D. increased concentration of oxyhemoglobin in the blood. |
| 4. | The diaphragm assists breathing by A. moving the ribs up. B. stimulating the lungs to absorb oxygen. C. changing the volume of the thoracic cavity. D. allowing the lungs to move freely in the thoracic cavity. |
| 5. | Inhalation is caused by A. the diaphragm moving up and the ribs moving in. B. the diaphragm moving up and the ribs moving out. C. the diaphragm moving down and the ribs moving in. D. the diaphragm moving down and the ribs moving out. |
| 6. | The destruction of the cilia lining the respiratory tract would result in A. decreased breathing rate. B. decreased mucus production. C. increased debris in the airways. D. increased temperature in the lungs. |
| 7. | Alveoli would not be characterized as A. muscular. B. thin-walled. C. vascularized. D. secreting a lipoprotein. |
| 8. | Air pressure is reduced inside the thoracic cavity when A. the rib muscles relax. B. the diaphragm moves up. C. the rib cage moves up and out. D. the pleural membranes collapse. |
| 9. | Cilia in the trachea A. remove debris. B. produce mucus. C. move by peristalsis. D. increase the surface area. |
| 10. | The pleural membranes begin to expand and stretch when A. both the diaphragm and rib muscles relax. B. both the diaphragm and rib muscles contract. C. the diaphragm contracts and the rib muscles relax. D. the diaphragm relaxes and the rib muscles contract. |
| 11. | Cilia are found in the A. larynx. B. alveoli. C. trachea. D. esophagus. |
| 12. | Which of the following is caused by the contraction of the diaphragm? A. Exhalation. B. Relaxation of the rib muscles. C. Downward movement of the rib cage. D. Increase in volume of the chest cavity. |
| 13. | The vocal chords are found in which structure? A. Larynx. B. Bronchi. C. Pharynx. D. Epiglottis. |
| 14. | Which of the following occurs during expiration? A. Diaphragm and rib muscles contract. B. Diaphragm contracts and rib cage lifts. C. Diaphragm relaxes and rib muscles contract. D. Diaphragm relaxes and rib cage moves down. |
| 15. | Use the following information to answer the question: 1. Alveoli 2. Bronchi 3. Trachea 4. Bronchioles What is the order in which air passes through these structures during inhalation? A. 2, 1, 3, 4 B. 2, 4, 1, 3 C. 3, 2, 4, 1 D. 3, 4, 2, 1 |
| 16. | The correct sequence of structures through which air passes during inhalation is A. bronchi, bronchioles, alveoli, trachea. B. bronchioles, bronchi, trachea, alveoli. C. trachea, bronchi, alveoli, bronchioles. D. trachea, bronchi, bronchioles, alveoli. |
| 17. | The process of inhaling is accomplished in part by A. relaxation of the diaphragm. B. contraction of the rib muscles. C. a decrease in the volume of the thoracic cavity. D. an increase in the pressure of the thoracic cavity. |
| 18. | The vocal chords are found in which structure? A. Larynx. B. Bronchi. C. Pharynx. D. Epiglottis. |
| 19. | Pleural membranes A. line the alveoli. B. surround the lungs. C. prevent the collapse of the trachea. D. collapse the lungs between breaths. |
| 20. | Alveoli are well-suited to their function because they A. possess cilia. B. have thick, muscular walls. C. are richly supplied with capillaries. D. are controlled by the autonomic nervous system. |
| 21. | The extensive capillary network which surrounds each alveolus A. prevents the alveoli from collapsing. B. produces mucus which protects the lungs. C. increases surface area for the exchange of gases. D. cools the air so diffusion of gases occurs more quickly. |
| 22. | Oxygen-poor blood becomes oxygen-rich blood at the A. alveoli. B. trachea. C. bronchi. D. bronchioles. |
| 23. | A puncture of the pleural membranes could lead to A. increased thoracic cavity pressure. B. decreased stimulation of carotid bodies. C. decreased contractions of the diaphragm. D. increased concentration of oxyhemoglobin (HbO ₂) in the blood. |
| 24. | As the blood becomes more acidic in muscle tissues, hemoglobin will carry less A. oxygen. B. hydrogen ion. C. carbon dioxide. D. bicarbonate ion. |
| 25. | Which of the following is not carried by hemoglobin? A. Oxygen. B. Sodium ions. C. Hydrogen ions. D. Carbon dioxide. |
| 26. | Hemoglobin releases oxygen at the tissues if A. temperature decreases and the blood is more acidic. B. temperature decreases and the blood is more basic. C. temperature increases and the blood is more acidic. D. temperature increases and the blood is more basic. |
| 27. | The function of the cilia lining the trachea is to A. secrete mucus. B. move air in and out of the lungs. C. move mucus away from the lungs. D. increase the surface area for gas exchange. |
| 28. | The level of CO ₂ in the blood is monitored by the A. cerebellum. B. hypothalamus. C. cerebral cortex. D. medulla oblongata. |

| | |
|-----|--|
| 29. | Which of the following is a controlling factor in increasing breathing rate? A. High pH at the medulla oblongata. B. High levels of CO ₂ in the carotid artery. C. Low levels of glucose in the coronary vein. D. Low concentration of bicarbonate ions HCO ₃ ⁻ in the aorta. |
| 30. | Increased concentrations of which gas are sensed by the brain and result in increased rate and depth of breathing? A. Water. B. Oxygen. C. Nitrogen. D. Carbon dioxide. |
| 31. | Where does oxygen diffuse into the blood? A. alveoli B. trachea C. bronchioles D. pleural membranes |
| 32. | The exchange of oxygen and carbon dioxide in external respiration occurs by A. osmosis. B. diffusion. C. active transport. D. facilitated diffusion. |
| 33. | The product of the reaction between Hb and O ₂ is A. bicarbonate. B. hemoglobin. C. oxyhemoglobin. D. carbaminohemoglobin. |
| 34. | Which of the following is the site of external respiration? A. Alveoli. B. Bronchioles. C. Mitochondria. D. Muscle tissue. |
| 35. | Which of the following reactions would be considered a part of external respiration? A. O ₂ + Hb → HbO ₂ B. CO ₂ + Hb → HbCO ₂ C. O ₂ + H ₂ O → H ₂ O ₂ D. CO ₂ + H ₂ O → H ₂ CO ₃ |
| 36. | Which of the following is an example of internal respiration? A. H ⁺ + HCO ₃ ⁻ → H ₂ CO ₃ → H ₂ O + CO ₂ B. C ₆ H ₁₂ O ₆ + 6O ₂ → 6H ₂ O + 6CO ₂ + 38 ATP. C. Diffusion of oxygen from the alveoli to the pulmonary vein. D. Diffusion of carbon dioxide from the nephron to the renal capillary. |
| 37. | The cilia lining the trachea function to A. keep the tract open. B. move air down the tract. C. stop food from entering the tract. D. sweep debris and mucus from the tract. |
| 38. | Which of the following would cause a decrease in the pH of the blood during internal respiration? A. running for ten minutes B. digestion of an acidic food C. taking in several deep breaths D. prolonged period of inactivity |
| 39. | Internal respiration is the exchange of A. glucose and hydrogen ions between the air and the blood. B. oxygen and carbon dioxide between the air and the blood. C. glucose and hydrogen ions between the blood and tissue fluid. D. oxygen and carbon dioxide between the blood and tissue fluid. |
| 40. | Diffusion of carbon dioxide from the intestinal tissues to the mesenteric capillaries is called A. breathing. B. internal respiration. C. cellular respiration. D. external respiration. |
| 41. | Internal respiration is defined as A. exchange of gases between blood and air. B. production of ATP, CO ₂ and HO ₂ in cells. C. exchange of gases between blood and tissues. D. entrance and exit of air into and out of the lungs. |
| 42. | Oxygen and carbon dioxide cross the membranes between the capillaries and alveoli by A. osmosis. B. filtration. C. diffusion. D. active transport. |
| 43. | Most of the carbon dioxide produced by tissues is carried back to the lungs as A. bicarbonate ions. B. reduced hemoglobin. C. carbaminohemoglobin. D. a gas dissolved in plasma. |
| 44. | Which of the following would have the highest concentrations of both bicarbonate ions and reduced hemoglobin? A. an iliac vein B. a carotid artery C. a coronary artery D. a pulmonary vein |
| 45. | Consider the following reaction: CO ₂ + H ₂ O → H ₂ CO ₃ An enzyme found in red blood cells that catalyzes this reaction is A. nuclease. B. peptidase. C. dehydrogenase. D. carbonic anhydrase. |
| 46. | The formation of carbaminohemoglobin occurs in the A. veins. B. arteries. C. arterioles. D. capillaries. |
| 47. | Carbonic anhydrase catalyzes a reaction between A. water + hydrogen. B. water + hemoglobin. C. water + carbon dioxide. D. hydrogen + hemoglobin. |
| 48. | Hydrogen ions produced during internal respiration will not affect the pH of the blood because the hydrogen ions combine with A. ammonia to form urea. B. oxygen to form oxyhemoglobin. C. hemoglobin to form reduced hemoglobin. D. carbon dioxide (CO ₂) to form carbonic acid (H ₂ CO ₃). |
| 49. | A poison that destroys carbonic anhydrase will cause death from A. destruction of the sino-atrial node. B. a lack of oxygen entering the cells. C. a blockage of excitatory transmitters. D. an accumulation of nitrogen in the blood. |
| 50. | In what form is most of the carbon dioxide (CO ₂) transported in the blood? A. Dissolved gas. B. Bicarbonate ions. C. Reduced hemoglobin. D. Carbaminohemoglobin. |
| 51. | Where does gas exchange take place in the lungs? A. Alveoli. B. Trachea. C. Bronchi. D. Bronchioles |
| 52. | High concentrations of bicarbonate ion (HCO ₃ ⁻) the blood will result in A. increased rate of breathing. B. decreased rate of breathing. C. increased pressure in the chest cavity. D. decreased nervous stimulation of the diaphragm. |
| 53. | Most of the carbon dioxide in the blood is carried in the form of A. bicarbonate ions. B carbon dioxide gas. C. carbonic anhydrase. D. carbaminohemoglobin. |
| 54. | What is the correct sequence of structures through which an oxygen molecule passes from the nostrils to the alveolus? A. larynx, right bronchus, trachea, bronchioles B. right bronchus, larynx, bronchioles, trachea C. larynx, trachea, right bronchus, bronchioles D. trachea, larynx, bronchioles, right bronchus |
| 55. | Blood entering the systemic circulation carries high concentrations of A. oxyhemoglobin. B. bicarbonate ions. C. reduced hemoglobin. D. carbaminohemoglobin. |
| 56. | Which of the following reactions occurs in a capillary of the leg? A. Hb + H ⁺ = HHb B. HbCO ₂ = Hb + CO ₂ C. Hb + oxygen = HbO ₂ D. H ⁺ + HCO ₃ ⁻ = H ₂ CO ₃ |
| 57. | Carbaminohemoglobin is formed in the A. large intestine by <i>E. Coli</i> . B. alveolus when excess oxygen is present. C. capillary for the transport of carbon dioxide. D. nephron from the breakdown of amino acids. |
| 58. | Most hemoglobin becomes reduced inside a(n) A. artery. B. venule. C. arteriole. D. capillary. |
| 59. | Which of the following would occur if there were a decreased level of hemoglobin in the blood? A. Breathing rate would decline. B. Tissues would become more acidic. C. Carbonic anhydrase would be more effective. D. Carbaminohemoglobin levels would increase. |
| 60. | The cilia found in the respiratory system function to A bring air into the lungs. B. force air out of the lungs. C. initiate the coughing reflex. D. move mucus towards the glottis. |
| 61. | The pleural membranes function to A. strengthen the thoracic cavity. B. stimulate the medulla oblongata. C. increase the surface area of the lungs. D. maintain negative pressure in the thoracic cavity. |
| 62. | Which of the following is not a hydrolytic enzyme? A. Lipase. B. Trypsin. C. Amylase. D. Carbonic anhydrase. |
| 63. | Internal respiration is defined as A. exchange of gases between blood and air. B. production of ATP, CO ₂ and HO ₂ in cells. C. exchange of gases between blood and tissues. D. entrance and exit of air into and out of the lungs. |
| 64. | Oxygen-poor blood becomes oxygen-rich blood at the A. alveoli. B. trachea. C. bronchi. D. bronchioles. |

| | |
|-----|---|
| 65. | A build-up of fluid in the lungs will result in a reduced amount of oxygen in the blood returning to the heart from the lungs because A. the bronchioles have dilated. B. there is less hemoglobin in the blood. C. the surface area for external respiration has been reduced. D. the permeability of the lung capillaries has been increased. |
| 66. | A puncture of the pleural membranes could lead to A. increased thoracic cavity pressure. B. decreased stimulation of carotid bodies. C. decreased contractions of the diaphragm. D. increased concentration of oxyhemoglobin (HbO ₂) in the blood. |
| 67. | Which of the following is a controlling factor in increasing breathing rate? A. High pH at the medulla oblongata. B. High levels of CO ₂ in the carotid artery. C. Low levels of glucose in the coronary vein. D. Low concentration of bicarbonate ions HCO ₃ in the aorta. |

EXCRETORY SYSTEM

| | |
|-----|--|
| 1. | Which structure carries urine from the bladder to the outside of the body? A. ureter B. urethra C. renal pelvis D. collecting duct |
| 2. | The tube that carries urine out of the bladder is the A. ureter. B. urethra. C. distal tubule. D. collecting duct. |
| 3. | Urine is stored in the A. ureter. B. kidney. C. urethra. D. urinary bladder. |
| 4. | Excretion can be defined as the removal of A. toxins from the blood. B. bacteria from the body. C. metabolic wastes from the body. D. excess red blood cells from the blood. |
| 5. | The function of the ureter is to A. produce urine. B. reabsorb water. C. transport urine from the kidney. D. store urine until it can be released. |
| 6. | Urine leaves the bladder through the A. ureter. B. urethra. C. loop of Henle. D. collecting duct. |
| 7. | Which of the following is not a function of the kidneys? A. Maintaining a constant blood pH. B. Producing urea from protein metabolism. C. Removing metabolic wastes from the blood. D. Regulating the amount of water in the body. |
| 8. | Which of the following structures would not be considered an organ of excretion? A. Skin. B. Liver. C. Colon. D. Small intestine. |
| 9. | Production of urea occurs in the A. skin. B. liver. C. lungs. D. kidneys. |
| 10. | Which of the following metabolic wastes is excreted by the skin? A. Bile. B. Urea. C. Uric acid. D. Carbon dioxide. |
| 11. | Blood is brought to the glomerulus by the A. renal vein. B. afferent arteriole. C. efferent arteriole. D. peritubular capillaries. |
| 12. | In a healthy person, Bowman's capsules are found in the renal A. vein. B. pelvis. C. cortex. D. medulla. |
| 13. | Which of the following is not a characteristic of the glomerulus? A. It is composed of capillaries. B. It surrounds the Bowman's capsule. C. Its blood pressure promotes filtration. D. It is connected to arterioles at both ends. |
| 14. | Which capillaries are enclosed by Bowman's capsule? A. Distal. B. Proximal. C. Peritubular. D. Glomerular. |
| 15. | Filtrate enters the Bowman's capsule by A. active transport. B. tubular excretion. C. pressure filtration. D. selective reabsorption. |
| 16. | The composition of the filtrate in the Bowman's capsule is determined by A. pH. B. enzymes. C. temperature. D. molecular size. |
| 17. | Movement of fluids from the glomerulus to Bowman's capsule is due to A. osmosis. B. secretion. C. active transport. D. pressure filtration. |
| 18. | Pressure filtration occurs at the A. glomerulus. B. loop of Henle. C. collecting duct. D. afferent arteriole. |
| 19. | Blood entering the kidney is filtered by the A. glomerulus. B. distal tubule. C. loop of Henle. D. collecting duct. |
| 20. | The glomerulus is located between the A. efferent arteriole and renal vein. B. renal artery and afferent arteriole. C. afferent arteriole and efferent arteriole. D. efferent arteriole and peritubular capillaries. |
| 21. | Where in the nephron does pressure filtration of the blood occur? A. Loop of Henle. B. Collecting duct. C. Proximal tubule. D. Bowman's capsule. |
| 22. | Where is most of the glucose in the nephron reabsorbed? A. Loop of Henle. B. Collecting duct. C. Distal convoluted tubule. D. Proximal convoluted tubule. |
| 23. | Which of the following organelles is found in large numbers in the cells which line the proximal convoluted tubule? A. Cilia. B. Mitochondria. C. Golgi apparatus. D. Rough endoplasmic reticulum. |
| 24. | Which of the following structures requires a hypertonic environment to function? A. Glomerulus. B. Loop of Henle. C. Afferent arteriole. D. Bowman's capsule. |
| 25. | 45. The tonicity of the tissue surrounding the loop of Henle is vital to the maintenance of blood volume because it A. adjusts the pH of the urine. B. filters the blood going back to the heart. C. moves water from the urine back into the blood. D. moves glucose from the urine back into the blood. |
| 26. | Which of the following describes the tissues surrounding the loop of Henle? A. High H ⁺ concentration, high K ⁺ concentration. B. Low water concentration, low salt concentration. C. High salt concentration, low water concentration. D. High water concentration, low K ⁺ concentration. |
| 27. | The site of tubular excretion is the A. loop of Henle. B. Bowman's capsule. C. distal convoluted tubule. D. proximal convoluted tubule. |
| 28. | As filtrate moves through the nephron it becomes increasingly hypertonic because of the A. diffusion of glucose. B. pressure filtration of the blood. C. active transport of sodium ions. D. reabsorption of bicarbonate ions. |
| 29. | The composition of the glomerular filtrate in a healthy person is identical to plasma, except for the amount of A. salt. B. protein. C. glucose. D. carbon dioxide. |
| 30. | The sequence of structures that urea passes through in the nephron is A. glomerulus, proximal tubule, distal tubule, loop of Henle. B. glomerulus, proximal tubule, capillary network, renal vein. C. proximal tubule, loop of Henle, distal tubule, collecting duct. D. proximal tubule, distal tubule, loop of Henle, collecting duct. |
| 31. | Most of the blood glucose entering the nephron returns to the plasma by the process of A. osmosis in the loop of Henle. B. tubular excretion in the distal tubule. C. active transport in the proximal tubule. D. facilitated transport in the distal tubule. |
| 32. | Which substance would normally be found in higher concentration in urine than in blood? A. Urea. B. Protein. C. Oxygen. D. Glucose. |
| 33. | The correct sequence for the path of urine is 1. Ureter. 2. Urethra. 3. Kidney. 4. Urinary bladder. A. 1, 3, 2, 4 B. 3, 1, 4, 2 C. 3, 2, 1, 4 D. 3, 2, 4, 1 |
| 34. | The process that moves glucose from the proximal convoluted tubule into the peritubular capillaries is A. osmosis. B. tubular excretion. C. pressure filtration. D. selective reabsorption. |
| 35. | Which of the following would cause the kidney to produce a more concentrated urine? A. Increased blood volume. B. Increased alcohol intake. C. Decreased blood pressure. D. Decreased ADH secretion. |
| 36. | 1. H ₂ O reabsorption. 2. Tubular excretion. 3. Pressure filtration. 4. Selective reabsorption. Using the above information, which of the following gives the correct order of urine formation? A. 1, 3, 4, 2 B. 2, 4, 1, 3 C. 3, 2, 1, 4 D. 3, 4, 1, 2 |

| | |
|-----|---|
| 37. | Which of the following occurs in the distal tubule to return acidic blood back to a normal pH? A. Both sodium and hydrogen ions are excreted. B. Bicarbonate ions are excreted and hydrogen ions are reabsorbed. C. Ammonia and hydrogen ions are excreted and sodium ions are reabsorbed. D. Ammonia and hydrogen ions are reabsorbed and bicarbonate ions are excreted. |
| 38. | If the blood becomes acidic, the kidneys will maintain homeostasis by actively excreting A. penicillin. B. histamine. C. calcium ions. D. hydrogen ions. |
| 39. | The excretory system regulates the amount of bicarbonate ion (HCO_3^-) in the blood in order to maintain homeostatic levels of A. water. B. glucose. C. ammonia NH_3 . D. hydrogen ions H^+ . |
| 40. | If the blood is excessively acidic, it will likely lead to urine A. of increased pH. B. of decreased pH. C. with increased Na^+ concentration. D. with decreased NH_3 concentration. |
| 41. | The source of antidiuretic hormone (ADH) is the A. thyroid. B. adrenal cortex. C. anterior pituitary. D. posterior pituitary. |
| 42. | Antidiuretic hormone (ADH) is released by the A. kidneys. B. pancreas. C. anterior pituitary. D. posterior pituitary. |
| 43. | Which of the following would increase as ADH levels rise? A. Blood volume. B. Glucose levels in the plasma. C. Amount of urine in the bladder. D. Urea concentration in the plasma. |
| 44. | Antidiuretic hormone (ADH) has an effect on the A. glomerulus. B. loop of Henle. C. collecting duct. D. proximal tubule. |
| 45. | Alcohol affects the release of ADH. Alcohol causes an increase in the volume and a decrease in the concentration of urine produced. Therefore, ADH affects the A. Loop of Henle. B. collecting duct. C. proximal tubule. D. Bowman's capsule. |
| 46. | Low levels of sodium ions Na^+ in the body result in the secretion of A. insulin. B. thyroxin. C. aldosterone. D. oxytocin. |
| 47. | The inability to regulate the concentration of sodium ions in the blood could be due to improper functioning of the A. adrenal cortex, since it produces ADH. B. adrenal cortex, since it produces aldosterone. C. adrenal medulla, since it produces ADH. D. adrenal medulla, since it produces aldosterone. |
| 48. | Decreasing the concentration of sodium ions in the blood will result in A. increased ADH secretion and increased aldosterone secretion. B. increased ADH secretion and decreased aldosterone secretion. C. decreased ADH secretion and increased aldosterone secretion. D. decreased ADH secretion and decreased aldosterone secretion. |
| 49. | Aldosterone is secreted by the A. testes. B. nephron. C. adrenal cortex. D. posterior pituitary. |
| 50. | The concentration of sodium in the blood would increase with increased plasma levels of a hormone from the A. thyroid gland B. adrenal gland C. prostate gland D. anterior pituitary gland |
| 51. | Increasing the levels of aldosterone in the blood would result in A. increased blood volume. B. decreased blood pressure. C. decreased urea production. D. increased urine production. |
| 52. | The hormone aldosterone is involved in the regulation of A. the body's metabolic rate. B. water excretion by the kidneys. C. sodium and potassium levels in the plasma. D. calcium and phosphorous levels in the plasma. |
| 53. | Increased levels of aldosterone cause A. acidic blood. B. hypotonic urine. C. low blood pressure. D. decreased urine production. |
| 54. | Which of the following causes the release of aldosterone? A. High iron levels in the blood. B. Low sodium levels in the blood. C. High calcium levels in the blood. D. Low potassium levels in the blood. |
| 55. | Sodium levels in the blood are regulated by A. insulin. B. cortisol. C. thyroxin. D. aldosterone. |
| 56. | Which of the following symptoms might be an indication of kidney failure? A. Salt in the urine. B. Urea in the urine. C. Protein in the urine. D. Uric acid in the urine. |
| 57. | The concentration of glucose in the glomerular filtrate is greater than in the urine because glucose is A. excreted. B. reabsorbed. C. a large molecule. D. used to provide energy for reabsorption. |
| 58. | Which substance is found in the glomerulus, Bowman's capsule and efferent arteriole but is not normally found in the collecting duct? A. urea B. glucose C. penicillin D. sodium ions |
| 59. | When comparing the blood concentrations of urea and glucose in the hepatic portal vein to those in the renal vein, one finds that in the hepatic portal vein A. urea is lower and glucose is lower. B. urea is lower and glucose is higher. C. urea is higher and glucose is lower. D. urea is higher and glucose is higher. |
| 60. | Which of the following is the source of aldosterone? A. Pancreas. B. Thyroid gland. C. Adrenal gland. D. Anterior pituitary. |
| 61. | When the level of ADH (antidiuretic hormone) increases in the blood, A. less water is reabsorbed and urine output increases. B. less water is reabsorbed and urine output decreases. C. more water is reabsorbed and urine output decreases. D. more water is reabsorbed and urine output increases. |
| 62. | The part of the nephron having the greatest glucose concentration is the A. loop of Henle. B. collecting duct. C. Bowman's capsule. D. distal convoluted tubule. |
| 63. | High blood pressure can be the result of A. decreased blood volume. B. increased sodium absorption. C. decreased aldosterone release. D. increased opening of capillary beds. |
| 64. | Which of the following would not be found in high concentration in the urine of a healthy individual? A. Salt. B. Water. C. Protein. D. Uric acid. |
| 65. | Which hormone is released when the salt concentration in the blood increases? A. Gastrin. B. Thyroxin. C. Antidiuretic hormone (ADH). D. Adrenocorticotrophic hormone (ACTH). |
| 66. | Low blood volume will result in A. increased secretion of ADH and aldosterone. B. decreased secretion of ADH and aldosterone. C. increased secretion of ADH and a decrease in aldosterone. D. decreased secretion of ADH and an increase in aldosterone. |
| 67. | High concentrations of ADH (antidiuretic hormone) in the blood will result in A. increased excretion of H_2O . B. decreased pressure filtration. C. decreased reabsorption of glucose. D. increased solute concentration of the urine. |
| 68. | Which of the following is produced in response to a high solute concentration in the blood? A. Insulin. B. Adrenalin. C. Aldosterone. D. Antidiuretic hormone (ADH). |

NERVOUS SYSTEM

| | |
|----|---|
| 1. | Which of the following is controlled by the somatic nervous system? A. rate of heartbeat B. contraction of skeletal muscles C. increased blood flow to muscle tissue D. movement of food through the intestines |
| 2. | Which of the components of the nervous system has both autonomic and somatic divisions? A. Central. B. Peripheral. C. Sympathetic. D. Parasympathetic. |
| 3. | The central nervous system includes the A. brain and spinal cord. B. somatic nervous system. C. cranial and spinal nerves. D. parasympathetic nervous system. |

| | |
|-----|---|
| 4. | The somatic nervous system controls A. peristalsis. B. cardiac muscles. C. smooth muscles. D. skeletal muscles. |
| 5. | Which of the following is involved in the initiation of a "fight or flight" response? A. Thyroid gland. B. Prostate gland. C. Adrenal cortex. D. Adrenal medulla. |
| 6. | The part of a sensory neuron that transmits nerve impulses from a receptor to the cell body is the A. axon. B. synapse. C. dendrite. D. neurotransmitter. |
| 7. | What type of neuron transmits an impulse to the central nervous system? A. Motor. B. Sensory. C. Efferent. D. Interneuron. |
| 8. | The type of neuron that can only be found in the central nervous system (CNS) is a(n) A. interneuron. B. motor neuron. C. mixed neuron. D. sensory neuron. |
| 9. | The type of neuron that is found only in the central nervous system is the A. interneuron. B. motor neuron. C. mixed neuron. D. sensory neuron. |
| 10. | Which of the following is responsible for transmitting impulses to the central nervous system (CNS)? A. Effectors. B. Interneurons. C. Motor neurons. D. Sensory neurons. |
| 11. | Sensory neurons carry messages to A. glands. B. interneurons. C. sense organs. D. muscle fibres. |
| 12. | Sensory receptors initiate nerve impulses in A. long axons. B. short axons. C. long dendrites. D. short dendrites. |
| 13. | Which of the following is a characteristic of a resting potential? A. secretion of calcium ions B. neurotransmitters move into the axon C. depolarization of the post-synaptic membrane D. a net negative charge on the inside of the axon |
| 14. | During which stage of a nerve impulse does the opening of the sodium gates play an important role? A. Recovery. B. Repolarization. C. Depolarization. D. Resting potential. |
| 15. | Resting potential in a neuron is maintained by A. osmosis. B. diffusion. C. pinocytosis. D. active transport. |
| 16. | Which organelle would be required in large numbers by a cell whose membrane is often depolarized? A. Ribosome. B. Lysosome. C. Mitochondrion. D. Endoplasmic reticulum. |
| 17. | Within an axon, an increased concentration of sodium ions and a decreased concentration of potassium ions is observed during A. upswing. B. downswing. C. resting potential. D. synaptic transmission. |
| 18. | The resting potential in a neuron is maintained by A. exocytosis. B. active transport. C. passive diffusion. D. facilitated transport. |
| 19. | The correct sequence for the transmission of a nerve impulse along a neuron is 1. Potassium gates open. 2. Sodium ions diffuse into neuron. 3. Resting potential. 4. Recovery. A. 1, 2, 3, 4 B. 2, 3, 4, 1 C. 3, 2, 1, 4 D. 4, 3, 1, 2 |
| 20. | The correct sequence for the transmission of a nerve impulse along a neuron is 1. Potassium gates open. 2. Sodium ions diffuse into neuron. 3. Resting potential. 4. Recovery. A. 1, 2, 3, 4 B. 2, 3, 4, 1 C. 3, 2, 1, 4 D. 4, 3, 1, 2 |
| 21. | Nerve cells are called A. axons. B. neurons. C. dendrites. D. meninges. |
| 22. | Depolarization of a nerve cell is caused by A. the sodium potassium pump. B. sodium ions entering the cell. C. the opening of the potassium gates. D. a return of membrane potential to -60mV. |
| 23. | Depolarization of an axon results from the movement of A. sodium ions. B. hydrogen ions. C. potassium ions. D. bicarbonate ions. |
| 24. | The distribution of sodium and potassium ions across the membrane of an axon is maintained by A. diffusion. B. exocytosis. C. phagocytosis. D. active transport. |
| 25. | Which of the following best describes the location of ions during resting potential? A. A low concentration of sodium ions on the outside, and a high concentration of potassium ions on the inside of the neuron. B. A low concentration of sodium ions on the outside, and a low concentration of potassium ions on the inside of the neuron. C. A high concentration of sodium ions on the outside, and a low concentration of potassium ions on the inside of the neuron. D. A high concentration of sodium ions on the outside, and a high concentration of potassium ions on the inside of the neuron. |
| 26. | The distribution of sodium and potassium ions during resting potential is maintained by A. osmosis. B. diffusion. C. active transport. D. facilitated transport. |
| 27. | Use the following information to answer the question. 1. Sodium ions move into the axon. 2. Potassium ions move out of the axon. 3. Depolarization of the membrane occurs. 4. Repolarization of the membrane occurs. Select the correct order of the above events to describe an action potential. A. 1, 3, 2, 4 B. 2, 3, 4, 1 C. 3, 2, 4, 1 D. 1, 4, 3, 2 |
| 28. | The speed of a nerve impulse along a sensory neuron depends on the A. dendrites. B. cell bodies. C. myelin sheath. D. sensory receptors. |
| 29. | The myelin sheath is a protective covering that surrounds A. only motor neurons. B. all types of neurons. C. only sensory neurons. D. both motor and sensory neurons. |
| 30. | Which of the following most accurately describes the function of the nodes of Ranvier? A. Release neurotransmitters. B. Nourish and protect the neuron. C. Cause the 'all or none' response. D. Speed the transmission of nerve impulses. |
| 31. | In order for a nerve impulse to pass from one neuron to the next, which of the following ions must be present at the pre-synaptic ending? A. Calcium (Ca ²⁺) . B. Chloride (Cl ⁻) . C. Phosphate (PO ₄ ³⁻) . D. Magnesium (Mg ²⁺) . |
| 32. | Using the information below, what is the correct order for the transmission of an impulse across a synapse? 1. Calcium interacts with proteins. 2. Vesicles fuse with synaptic membrane. 3. Neurotransmitter diffuses into synaptic cleft. 4. Receptor sites are occupied. A. 1, 2, 3, 4 B. 2, 3, 1, 4 C. 3, 2, 1, 4 D. 4, 1, 3, 2 |
| 33. | At a synapse, the neurotransmitters move to the receptor sites by A. osmosis. B. diffusion. C. active transport. D. facilitated transport. |
| 34. | At a synapse, the neurotransmitters move to the receptor sites by A. osmosis. B. diffusion. C. active transport. D. facilitated transport. |
| 35. | 34. The function of enzymes in the synaptic cleft is to ensure that A. neurotransmitters are released. B. neurotransmitters are destroyed. C. nerve impulses reach receptor sites. D. nerve impulses travel in both directions. |
| 36. | The neurotransmitter used by the sympathetic nervous system is A. gastrin. B. noradrenalin. C. acetylcholine. D. acetylcholinesterase. |
| 37. | Once a neurotransmitter has been released, it has only a short time to act because A. enzymes inactivate it. B. receptor sites break down. C. calcium ions flow into the cleft. D. the postsynaptic membrane closes. |
| 38. | Nerve impulses are not continuously generated at a synapse because A. there are insufficient calcium ions. B. the presynaptic membrane is depolarized. C. the synaptic membranes become impermeable. D. neurotransmitters are broken down by enzymes. |
| 39. | In an axon, the nerve impulses normally travel A. in both directions. B. toward the cell body. C. away from the cell body. D. faster as they are unmyelinated. |

| | | | | | | | |
|---------------------|--|-------------------|-------------------|-------------|-----------------------|---------------------|---------------------------|
| 40. | Which of the following substances would not be found in synaptic clefts? A. Noradrenalin. B. Acetylcholine. C. Cholinesterase. D. Carbonic anhydrase. | | | | | | |
| 41. | Use the following information to answer the question: 1. Axon 2. Dendrite 3. Cell body 4. Receptor The correct order for the transmission of an impulse along a sensory neuron is A. 3, 1, 4, 2 B. 3, 2, 1, 4 C. 4, 1, 3, 2 D. 4, 2, 3, 1 | | | | | | |
| 42. | Nerve impulses travel in only one direction because of the location of the A. effectors. B. myelin sheath. C. synaptic vesicles. D. nodes of Ranvier. | | | | | | |
| 43. | The speed of nerve impulse conduction is increased by the presence of A. axons. B. myelin. C. dendrites. D. cell bodies. | | | | | | |
| 44. | Transmission across a synapse is one-way because A. the axon is myelinated. B. the potassium gates are open. C. the interior of the axon contains negative ions. D. the receptor sites are on the postsynaptic membrane. | | | | | | |
| 45. | Neurotransmitters may create an action potential when they A. fit into receptor sites. B. move through protein pores. C. are broken down in the synapse. D. excite the presynaptic membrane. | | | | | | |
| 46. | A pesticide that destroys an enzyme found in the synaptic cleft may cause A. denaturation of the presynaptic contractile proteins. B. an increased rate of diffusion across the synaptic cleft. C. continued depolarization of the postsynaptic membrane. D. alteration of the receptors on the presynaptic membrane. | | | | | | |
| 47. | Which of the following would be contained within the central nervous system? A. A neuron connecting the sensory and motor neurons. B. A sensory nerve running from a hand to the spinal cord. C. A motor nerve going from the brain to a skeletal muscle. D. A nerve running from the spinal cord to the stomach wall. | | | | | | |
| 48. | In a reflex arc, interneurons initiate nerve impulses in A. effectors. B. motor neurons. C. sensory neurons. D. sensory receptors. | | | | | | |
| 49. | In a reflex arc, the nerve impulse is initiated by A. the brain. B. an effector. C. a sensory neuron. D. a sensory receptor. | | | | | | |
| 50. | The sympathetic nervous system is responsible for A. decreasing breathing rate. B. increasing blood glucose levels. C. increasing blood flow to the intestines. D. decreasing blood flow to the skeletal muscles. | | | | | | |
| 51. | In a reflex arc, the nerve impulse is initiated by A. the brain. B. an effector. C. a sensory neuron. D. a sensory receptor. | | | | | | |
| 52. | In a reflex arc, the A. brain is stimulated by the effector. B. effector is stimulated before the brain. C. sensory receptor directly stimulates the effector. D. brain is stimulated at the same time as the receptor. | | | | | | |
| 53. | Reflexes involve the A. autonomic nervous system and the brain. B. sympathetic and central nervous systems. C. peripheral nervous system and the spinal cord. D. parasympathetic nervous system and the cerebrum. | | | | | | |
| 54. | The type of sensation a person experiences depends on the A. speed of the impulse. B. length of the dendrites. C. part of the brain stimulated. D. amount of myelin on the neuron. | | | | | | |
| 55. | The parasympathetic nervous system A. controls the central nervous system. B. lowers blood pressure and promotes digestion. C. uses noradrenalin as the neurotransmitter at synapses. D. initiates the "fight or flight" response in times of stress. | | | | | | |
| 56. | The secretion of noradrenalin into the synaptic cleft occurs by which of the following processes? A. exocytosis B. pinocytosis C. endocytosis D. active transport | | | | | | |
| 57. | Which of the following is correctly paired? A. sympathetic nervous system stimulation and acetylcholine B. sympathetic nervous system stimulation and a relaxed state C. parasympathetic nervous system stimulation and noradrenalin D. parasympathetic nervous system stimulation and a relaxed state | | | | | | |
| 58. | Which of the following is a true statement about the sympathetic and parasympathetic nervous systems? A. Sympathetic system causes increased rates of digestion while the parasympathetic system causes decreased rates of digestion. B. Sympathetic system causes decreased breathing rate while the parasympathetic system causes increased breathing rate. C. Sympathetic system causes constriction of the iris while the parasympathetic system causes dilation of the iris. D. Sympathetic system causes increased heart rate while the parasympathetic system decreases heart rate. | | | | | | |
| 59. | Which of the following would result from stimulation by the sympathetic nervous system? A. Hypotension. B. Constricted pupils. C. Decreased digestive rate. D. Reduced blood flow to skeletal muscles. | | | | | | |
| 60. | The hormone that initiates the "fight or flight" response is produced by the A. adrenal gland. B. hypothalamus. C. pituitary gland. D. medulla oblongata. | | | | | | |
| 61. | Which of the following neurons would be found in the autonomic nervous system? A. Sensory neurons in the skin. B. Sensory neurons in the spinal cord. C. Motor neurons ending in the intestines. D. Motor neurons ending in skeletal muscle. | | | | | | |
| 62. | The sympathetic nervous system would be most active while a person is A. digesting a large meal. B. in an athletic competition. C. recovering from an illness. D. writing biology definitions. | | | | | | |
| 63. | Which of the following explains why most organs are supplied by two separate autonomic nerves? A. One acts as a reserve neuron. B. One is sensory and one is motor. C. Both are needed in emergency situations. D. One stimulates the organ and one inhibits it. | | | | | | |
| 64. | Increased parasympathetic stimulation of the SA node will result in A. decreased heart rate. B. decreased heart volume. C. increased diastolic pressure. D. increased ventricular contraction rate. | | | | | | |
| 65. | Which of the following are immediately involved when a person is in a "fight or flight" situation? <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>1. Adrenal glands</td> <td>4. Thyroid glands</td> </tr> <tr> <td>2. Pancreas</td> <td>5. Sympathetic system</td> </tr> <tr> <td>3. Pituitary glands</td> <td>6. Parasympathetic system</td> </tr> </table> <p>A. 1, 3 B. 1, 5 C. 2, 4 D. 2, 6</p> | 1. Adrenal glands | 4. Thyroid glands | 2. Pancreas | 5. Sympathetic system | 3. Pituitary glands | 6. Parasympathetic system |
| 1. Adrenal glands | 4. Thyroid glands | | | | | | |
| 2. Pancreas | 5. Sympathetic system | | | | | | |
| 3. Pituitary glands | 6. Parasympathetic system | | | | | | |
| 66. | The sympathetic nervous system is responsible for A. decreasing breathing rate. B. increasing blood glucose levels. C. increasing blood flow to the intestines. D. decreasing blood flow to the skeletal muscles. | | | | | | |
| 67. | The body's response to immediate danger includes A. increased breakdown of protein in the stomach. B. decreased gas exchange during internal respiration. C. increased nervous stimulation of the adrenal medulla. D. decreased number of open capillary beds in skeletal muscle. | | | | | | |
| 68. | Which of the following will occur as a result of parasympathetic nervous system stimulation? A. Increased heart rate. B. Secretion of adrenalin. C. Increased breathing rate. D. Secretion of digestive enzymes. | | | | | | |
| 69. | Which of the following statements about the autonomic nervous system is false ? A. It controls the internal organs. B. It functions in a voluntary manner. C. It is responsible for the "fight or flight" response. D. Each impulse travels through two motor neurons and one ganglion. | | | | | | |
| 70. | A nerve to the heart is severed, resulting in a decreased heart rate. The severed nerve was likely a A. cranial nerve. B. somatic nerve. C. sympathetic nerve. D. parasympathetic nerve. | | | | | | |

| | |
|------|---|
| 71. | Sharing of information between the two cerebral hemispheres is possible because of the A. cerebellum. B. hypothalamus. C. corpus callosum. D. medulla oblongata. |
| 72. | A drug was observed to have the following effects on an individual: - increased breathing rate - increased blood pressure - increased heart rate The part of the brain affected by this drug is the A. thalamus. B. cerebellum. C. corpus callosum. D. medulla oblongata. |
| 73. | Which of the following would increase the heart rate? A. Corpus callosum. B. Somatic nervous system. C. Sympathetic nervous system. D. Parasympathetic nervous system. |
| 74. | Stimuli coming to the brain are sorted and channelled by the A. thalamus. B. cerebrum. C. cerebellum. D. hypothalamus. |
| 75. | A person with a damaged medulla oblongata would have difficulty A. reading. B. breathing. C. tasting food. D. problem solving. |
| 76. | A person recovering from a head injury finds that she has difficulty maintaining balance. Which part of the brain has been injured? A. Thalamus. B. Cerebellum. C. Hypothalamus. D. Medulla oblongata. |
| 77. | Damage to the corpus callosum could A. stimulate the parasympathetic system. B. increase the heart rate but decrease the breathing rate. C. inhibit the hypothalamus and stimulate the thyroid gland. D. inhibit the sharing of information between cerebral hemispheres. |
| 78. | Damage to the corpus callosum could A. stimulate the parasympathetic system. B. increase the heart rate but decrease the breathing rate. C. inhibit the hypothalamus and stimulate the thyroid gland. D. inhibit the sharing of information between cerebral hemispheres. |
| 79. | Two functions of the medulla oblongata are to control A. body position and vision. B. heart beat and breathing rate. C. sensory areas and motor areas. D. involuntary muscle contractions and metabolic rate. |
| 80. | The part of the brain responsible for muscle coordination is the A. cerebellum. B. hypothalamus. C. corpus callosum. D. medulla oblongata. |
| 81. | What part of the brain is malfunctioning if nerve impulses are unable to travel from the right to the left hemisphere? A. Cerebrum. B. Cerebellum. C. Hypothalamus. D. Corpus callosum. |
| 82. | Damage to the occipital lobe could affect A. sight. B. hearing. C. heartbeat. D. water balance. |
| 83. | The occipital lobe of the cerebral cortex has association areas for A. taste. B. smell. C. vision. D. hearing |
| 84. | The cerebral lobe of the brain that contains areas responsible for the sensations of touch, temperature, pressure and pain, and for the understanding of speech is the A frontal. B. parietal. C. occipital. D. temporal. |
| 85. | The part of the brain that would help you to concentrate on this examination even when other sensory stimuli are present is the A. thalamus. B. cerebellum. C. hypothalamus. D. medulla oblongata. |
| 86. | The part of the brain responsible for consciousness is the A. cerebrum. B. cerebellum. C. hypothalamus. D. pituitary gland. |
| 87. | Which of the following lobes of the cerebrum is responsible for vision? A. Frontal. B. Parietal. C. Occipital. D. Temporal. |
| 88. | Which of the following is not a part of the cerebrum? A. Cortex. B. Cerebellum. C. Occipital lobe. D. Temporal lobe. |
| 89. | In which lobe of the brain are sensory areas for hearing and smelling located? A. Frontal. B. Parietal. C. Occipital. D. Temporal. |
| 90. | How does the hypothalamus increase the metabolic rate of cells in the body? A. It produces and releases thyroxin. B. It secretes a specific releasing hormone. C. It increases autonomic nerve stimulation. D. It causes cells to become permeable to blood glucose. |
| 91. | A function of enzymes is to A. emulsify fats. B. carry information to nerves. C. catalyze chemical reactions. D. maintain constant blood pH. |
| 92. | The source gland for adrenalin is the A. pancreas. B. adrenal cortex. C. adrenal medulla. D. posterior pituitary. |
| 93. | Which of the following is a function of the hormone thyroxin? A. It decreases blood volume. B. It increases metabolic rate. C. It slows the release of insulin. D. It increases blood sodium levels. |
| 94. | A nerve impulse passes through the following structures when the heart contracts. The correct sequence is A. AV node, Purkinje fibres, SA node. B. SA node, Purkinje fibres, AV node. C. Purkinje fibres, SA node, AV node. D. SA node, AV node, Purkinje fibres. |
| 95. | Which of the following interacts with the pituitary gland as the neuroendocrine control centre? A. Thalamus. B. Cerebellum. C. Hypothalamus. D. Medulla oblongata. |
| 96. | A chemical produced by the puffer fish prevents the opening of sodium gates in neurons but has no effect on chemical synapses. In which location on a sensory neuron would impulse transmission initially be stopped when this chemical is injected into the foot? A. Cell body. B. Myelin sheath. C. Node of Ranvier. D. Terminal knob of an axon. |
| 97. | Which of the following would be a homeostatic response to a blood pressure reading of 80/50? A. Dilatation of the arteries. B. Sympathetic stimulation. C. Inhibited ACTH secretion. D. Decreased ADH secretion. |
| 98. | A hormone released by the posterior pituitary gland is A. gastrin. B. glucagon. C. parathyroid hormone (PTH). D. antidiuretic hormone (ADH). |
| 99. | Which of the following is not a hydrolytic enzyme? A. Lipase. B. Trypsin. C. Amylase. D. Carbonic anhydrase. |
| 100. | Which of the following are found only in the central nervous system? A. Interneurons. B. Motor neurons. C. Sensory neurons. D. Sensory receptors. |
| 101. | The speed of nerve impulse conduction is increased by the presence of A. axons. B. myelin. C. dendrites. D. cell bodies. |
| 102. | Which of the following are found only in the central nervous system? A. Interneurons. B. Motor neurons. C. Sensory neurons. D. Sensory receptors. |
| 103. | A person recovering from a head injury finds that she has difficulty maintaining balance. Which part of the brain has been injured? A. Thalamus. B. Cerebellum. C. Hypothalamus. D. Medulla oblongata. |
| 104. | Peristalsis may refer to the A. capillary beds of the digestive tract. B. closing of the glottis upon swallowing. C. activity of the sympathetic nervous system. D. rhythmic contraction of the wall of the esophagus. |
| 105. | The somatic nervous system includes nerves that serve the A. heart. B. intestines. C. salivary glands. D. skeletal muscles. |
| 106. | Which of the following would occur if an impulse from the SA node were blocked before it reaches the AV node? A. The heart would not contract. B. Only the atria would contract. C. Only the ventricles would contract. D. Blood would travel only to the pulmonary system. |
| 107. | The posterior pituitary gland releases A. adrenalin. B. aldosterone. C. thyroxin. D. antidiuretic hormone (ADH). |
| 108. | Due to a head injury, a patient's ability to breathe has been impaired. Where has the damage likely occurred? A. The cerebrum. B. The cerebellum. C. The hypothalamus. D. The medulla oblongata. |
| 109. | In an experiment, a hormone is injected into the heart muscle of a rat. The response is an increased heart rate. Which of the following glands was the source of the hormone? A. Pancreas. B. Thymus. C. Adrenal medulla. D. Anterior pituitary. |
| 110. | Damage to the medulla oblongata may result in A. hearing loss. B. impaired growth. C. breathing difficulty. D. loss of coordination. |

REPRODUCTIVE SYSTEM

| | |
|-----|--|
| 1. | The duct that is used by both the reproductive and excretory systems in males is the A. ureter. B. urethra. C. renal pelvis. D. vas deferens. |
| 2. | Storage and maturation of sperm occurs in the A. epididymis. B. corpus luteum. C. seminal vesicle. D. Cowper's gland. |
| 3. | A function of the interstitial cells of the testes is the A. storage of semen. B. maturation of sperm cells. C. production of testosterone. D. production of seminal fluid. |
| 4. | Which of the following store sperm cells and eliminate those that have major genetic defects? A. Epididymis. B. Interstitial cells. C. Seminal vesicles. D. Seminiferous tubules. |
| 5. | The part of the sperm that contains hydrolytic enzymes is the A. tail. B. nucleus. C. acrosome. D. mid-piece. |
| 6. | Which of the following is not a function of seminal fluid? A. provides a suitable pH B. supplies an energy source C. causes the uterus to contract D. constricts the urethra during ejaculation |
| 7. | The part of a sperm cell containing the greatest number of mitochondria is the A. head. B. flagellum. C. acrosome. D. mid-piece. |
| 8. | The sperm penetrates the egg by means of enzymes that are found in the A. tail. B. head. C. acrosome. D. mid-piece. |
| 9. | Which of the following would be affected by removal of the prostate gland? A. Urine formation. B. Motility of sperm. C. Sperm maturation. D. Follicle development. |
| 10. | Which part of a mature sperm contains mitochondria? A. Tail. B. Head. C. Midpiece. D. Acrosome. |
| 11. | When sperm is ejaculated, it comes into contact with or passes near each of the following structures. Which sequence correctly describes the passage of sperm out of the body? A. seminiferous tubules → prostate → vas deferens → urethra B. seminiferous tubules → vas deferens → urethra → prostate C. seminiferous tubules → vas deferens → prostate → urethra D. prostate → seminiferous tubules → vas deferens → urethra |
| 12. | Spermatogenesis occurs in the A. epididymis. B. interstitial cells. C. seminiferous tubules. D. ductus (vas) deferens. |
| 13. | Testosterone is produced in the A. epididymis. B. prostate gland. C. interstitial cells. D. seminiferous tubules. |
| 14. | Testosterone is produced in the A. epididymis. B. interstitial cells. C. seminal vesicles. D. seminiferous tubules. |
| 15. | When testosterone levels in a man's bloodstream decrease, A. the hypothalamus shuts down. B. more progesterone is secreted. C. luteinizing hormone (LH) secretion is increased. D. follicle-stimulating hormone (FSH) secretion is blocked. |
| 16. | The production of testosterone is regulated by A. oxytocin. B. progesterone. C. luteinizing hormone (LH). D. follicle-stimulating hormone (FSH). |
| 17. | Testosterone levels in males are regulated by A. aldosterone. B. progesterone. C. luteinizing hormone. D. follicle stimulating hormone. |
| 18. | The function of the endometrium is to A. carry the egg to the uterus. B. release an egg once a month. C. produce hormones for the uterine cycle. D. provide nourishment for the developing embryo. |
| 19. | Menstruation is the discharge of A. a follicle. B. the uterine lining. C. the corpus luteum. D. the cells lining the vagina. |
| 20. | A rise in blood levels of FSH at the beginning of the ovarian cycle causes A. menopause. B. the release of the egg. C. the maturation of the follicle. D. the breakdown of the endometrium. |
| 21. | Low levels of estrogen and progesterone in the blood will result in A. fertilization. B. no ovulation. C. menstruation. D. destruction of the corpus luteum. |
| 22. | Which of the following statements is correct regarding the sequence of events during the ovarian and uterine cycles? A. Ovulation occurs when progesterone levels decrease. B. The endometrium is shed as estrogen levels increase. C. As the corpus luteum degenerates, progesterone levels decrease. D. When implantation occurs, HCG (human chorionic gonadotropic) hormone levels decrease. |
| 23. | Which hormone triggers the release of the egg from the developing follicle? A. Estrogen. B. Progesterone. C. Luteinizing hormone (LH). D. Follicle stimulating hormone (FSH). |
| 24. | A woman who exhibits male secondary sexual characteristics may have a tumor in her A. ovary. B. pancreas. C. thyroid gland. D. adrenal gland. |
| 25. | Fertilization of the egg almost always occurs in the A. uterus. B. cervix. C. ovaries. D. oviducts. |
| 26. | Use the following information to answer the question. 1. Urethra 2. Epididymis 3. Vagina 4. Oviduct 5. Ductus vas deferens Which of the following would be the correct path of a sperm on its way to fertilize an egg? A. 1, 2, 3, 5, 4 B. 1, 3, 4, 5, 2 C. 2, 1, 3, 4, 5 D. 2, 5, 1, 3, 4 |
| 27. | Which of the following, if present in urine samples, would indicate pregnancy? A. estrogen B. progesterone C. luteinizing hormone (LH) D. human chorionic gonadotropin (HCG) |
| 28. | The hormone produced as a result of implantation is called A. testosterone. B. luteinizing hormone (LH). C. follicle stimulating hormone (FSH). D. human chorionic gonadotropic hormone (HCG). |
| 29. | The carbon dioxide produced by a developing fetus is removed by the A. cervix. B. placenta. C. oviducts. D. corpus luteum. |
| 30. | Positive feedback controls the secretion of which of the following hormones? A. Oxytocin. B. Calcitonin. C. Antidiuretic hormone. D. Growth hormone (GH). |
| 31. | The presence of human chorionic gonadotropin (HCG) in a woman's urine indicates that she A. is pregnant. B. has just ovulated. C. is about to menstruate. D. has decreased estrogen levels. |
| 32. | Most birth-control pills work by preventing egg maturation. These pills contain which of the following hormones? A. estrogen B. testosterone C. luteinizing hormone (LH) D. follicle-stimulating hormone (FSH) |
| 33. | Increased secretion of FSH (follicle-stimulating hormone) will result in increased production of A. sperm. B. progesterone. C. seminal fluid. D. human chorionic gonadotropin (HCG). |
| 34. | The site of testosterone production in the cytoplasm of an interstitial cell is the A. lysosome. B. mitochondrion. C. rough endoplasmic reticulum. D. smooth endoplasmic reticulum. |
| 35. | Testosterone is produced in the A. epididymis. B. interstitial cells. C. seminal vesicles. D. seminiferous tubules. |
| 36. | Which of the following hormones is controlled by positive feedback? A. Oxytocin. B. Testosterone. C. Progesterone. D. Follicle-stimulating hormone (FSH). |
| 37. | Which of the following hormones does not promote homeostasis? A. Insulin. B. Oxytocin. C. Calcitonin. D. Antidiuretic hormone (ADH). |

ANSWER KEY!!

BIOLOGICAL MOLECULES

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

68. D
69. B
70. C
71. C
72. C
73. B
74. C
75. D
76. D
77. A
78. D
79. D

DNA & PROTEIN SYNTHESIS

1. B
2. C
3. D
4. B
5. C
6. C
7. C
8. A
9. C
10. A
11. C
12. D
13. D
14. B
15. D
16. B
17. D
18. A
19. A
20. D
21. C
22. C
23. B
24. A
25. A
26. A
27. D
28. B
29. A
30. C
31. D
32. B
33. D

THE CELL

1. C
2. A
3. C
4. C
5. C
6. D
7. C
8. B
9. D
10. D
11. B
12. C
13. D
14. D
15. D
16. B
17. A
18. B

19. B
20. B
21. C
22. D
23. B
24. A
25. A
26. D
27. D
28. C
29. D
30. D

CELL MEMBRANE AND TRANSPORT

1. B
2. B
3. A
4. B
5. A
6. C
7. B
8. C
9. A
10. C
11. A
12. C
13. A
14. D
15. C
16. C
17. C
18. D
19. C
20. D
21. A
22. B
23. D
24. C
25. D
26. C

ENZYMES

1. C
2. D
3. C
4. B
5. B
6. C
7. C
8. B
9. C
10. C
11. B
12. A
13. C
14. B
15. B
16. B
17. B

DIGESTION & HUMAN ORGANIZATION

1. C
2. C
3. A
4. D

5. C
6. D
7. D
8. D
9. D
10. B
11. C
12. C
13. C
14. A
15. B
16. B
17. B
18. A
19. C
20. A
21. B
22. C
23. D
24. A
25. A
26. A
27. D
28. A
29. B
30. D
31. C
32. D
33. A
34. C
35. B
36. C
37. C
38. D
39. A
40. A
41. A
42. B
43. B
44. C
45. B
46. B
47. A
48. A
49. A
50. A
51. A
52. A
53. B
54. C
55. A
56. C
57. D
58. B
59. C
60. A
61. B
62. D
63. A
64. D
65. B
66. B
67. A
68. B
69. C
70. A
71. A
72. D

73. D
74. C
75. B
76. B
77. B
78. B
79. A
80. D
81. D
82. C
83. C
84. B
85. D
86. A
87. A
88. C
89. C
90. B

CIRCULATORY SYSTEM

1. B
2. A
3. D
4. D
5. C
6. C
7. A
8. B
9. C
10. C
11. C
12. D
13. A
14. B
15. B
16. B
17. B
18. B
19. A
20. D
21. C
22. B
23. B
24. C
25. C
26. B
27. A
28. D
29. A
30. C
31. C
32. D
33. A
34. B
35. C
36. D
37. C
38. D
39. D
40. D
41. C
42. A
43. D
44. C
45. C
46. C
47. D
48. D

49. A
50. B
51. D
52. B
53. C
54. A
55. B
56. C
57. B

BLOOD

1. B
2. A
3. B
4. B
5. C
6. B
7. D
8. C
9. D
10. C
11. A
12. A
13. A
14. D
15. C
16. C
17. C
18. D
19. C
20. A
21. B
22. D
23. C
24. C
25. C
26. C
27. D
28. D
29. C
30. C
31. C
32. D
33. B
34. D
35. C
36. D

RESPIRATORY SYSTEM

1. C
2. A
3. C
4. C
5. D
6. C
7. A
8. C
9. A
10. B
11. C
12. D
13. A
14. D
15. C
16. D
17. B
18. A

19. B
20. C
21. C
22. A
23. A
24. A
25. B
26. C
27. C
28. D
29. B
30. D
31. A
32. B
33. C
34. A
35. A
36. D
37. D
38. A
39. D
40. B
41. C
42. C
43. A
44. A
45. D
46. D
47. C
48. C
49. B
50. B
51. A
52. A
53. A
54. C
55. A
56. A
57. C
58. D
59. B
60. D
61. D
62. D
63. C
64. A
65. C
66. A
67. B

EXCRETORY SYSTEM

1. B
2. B
3. D
4. C
5. C
6. B
7. B
8. D
9. B
10. B
11. B
12. C
13. B
14. D
15. C
16. D
17. D

18. A
19. A
20. C
21. D
22. D
23. B
24. B
25. C
26. C
27. C
28. C
29. B
30. C
31. C
32. A
33. B
34. D
35. C
36. D
37. C
38. D
39. D
40. B
41. D
42. D
43. A
44. C
45. B
46. C
47. B
48. C
49. C
50. B
51. A
52. C
53. D
54. B
55. D
56. C
57. B
58. B
59. D
60. C
61. C
62. C
63. B
64. C
65. C
66. A
67. D
68. D

NERVOUS SYSTEM

1. B
2. B
3. A
4. D
5. D
6. C
7. B
8. A
9. A
10. D
11. B
12. C
13. D
14. C
15. D

16. C
17. B
18. B
19. C
20. C
21. B
22. B
23. A
24. D
25. D
26. C
27. A
28. C
29. D
30. D
31. A
32. A
33. B
34. B
35. B
36. B
37. A
38. D
39. C
40. D
41. D
42. C
43. B
44. D
45. A
46. C
47. A
48. B
49. D
50. B
51. D
52. B
53. C
54. C
55. B
56. A
57. D
58. D
59. C
60. A
61. C
62. B
63. D
64. A
65. B
66. B
67. C
68. D
69. B
70. C
71. C
72. D
73. C
74. A
75. B
76. B
77. D
78. D
79. B
80. A
81. D
82. A
83. C

84. B
85. A
86. A
87. C
88. B
89. D
90. B
91. C
92. C
93. B
94. D
95. C
96. C
97. B
98. D
99. D
100. A
101. B
102. A
103. B
104. D
105. D
106. B
107. D
108. D
109. C
110. C

REPRODUCTIVE SYSTEM

1. B
2. A
3. C
4. A
5. C
6. D
7. D
8. C
9. B
10. C
11. C
12. C
13. C
14. B
15. C
16. C
17. C
18. D
19. B
20. C
21. C
22. C
23. C
24. D
25. D
26. D
27. D
28. D
29. B
30. A
31. A
32. A
33. A
34. D
35. B
36. A
37. B

