



KAPLAN Medical/Clinical Laboratory Technician

Anatomy and Physiology

Table of Contents

Acknowledgements	AC-1
Catalog Program Description	CD-1
Program Overview	PO-1
Syllabus	SY-1
Textbooks and Resources List	TR-1
Weekly Calendar	WC-1
Exams/Quizzes and Answers	EX-1
<i>Anatomy and Physiology Mid-Term Exam</i>	<i>EX-2</i>
<i>Anatomy and Physiology Mid-Term Exam Answers</i>	<i>EX-8</i>
<i>Anatomy and Physiology Final Exam</i>	<i>EX-14</i>
<i>Anatomy and Physiology Final Exam Answers</i>	<i>EX-25</i>
<i>Anatomy and Physiology Mid-Term Exam (Alternate)</i>	<i>EX-36</i>
<i>Anatomy and Physiology Mid-Term Exam Answers (Alternate)</i>	<i>EX-42</i>
<i>Anatomy and Physiology Final Exam (Alternate)</i>	<i>EX-48</i>
<i>Anatomy and Physiology Final Exam Answers (Alternate)</i>	<i>EX-59</i>

Acknowledgements

The creation of the materials for M/CLT is a team effort and many people have made significant contributions.

We would like to thank the many instructors who have continued to dedicate themselves to improving education. We also appreciate our Campus Presidents, Executive Directors, Deans, and Directors of Education for their focus on helping our students succeed. We would like to acknowledge our consulting publishers for their expert work on the referenced textbooks, workbooks, electronic resources, and other materials.

We are grateful for the substantial contributions of the following individuals:

Wendy Miller, M.A., Program Director, Elgin Community College

Nicole-Henriette Pirnie, M.A, MBA

Mac McNeal, RN, MN, PhD., Program Director

Libby Spence, PhD., Associate Professor, University of Mississippi Medical Center

Karen Ritchie, Morrison Community Hospital

Juli Melanson

Donald R. Berthiaume, Andover College

Sheila Krystofek

Carolyn Livingston

Copyright © Kaplan Higher Education

6301 Kaplan University Avenue
Fort Lauderdale, Florida 33309

All rights reserved. This material is protected by copyright. No part of this material may be reproduced in any form or by any means, including photocopying, or utilized by any information storage and retrieval system without written permission from the copyright owner.

The publisher is not responsible (as a matter of product liability, negligence, or otherwise) for any injury resulting from any material contained herein. This publication contains information relating to general principles of medical care that should not be construed as specific instructions for individual patients. Manufacturers' product information and package inserts should be reviewed for current information, including contraindications, dosages, and precautions.

Printed in the United States of America.

Catalog Program Description

The Medical/Clinical Laboratory Technician (M/CLT) curriculum is an Associate's degree program that prepares an individual to perform clinical laboratory procedures under the supervision of a qualified pathologist and medical technologist. Students obtain a background in the basic sciences and an understanding of medical laboratory procedures. This basis of knowledge and skills prepares an individual to perform clinical laboratory procedures. Such procedures as chemistry, hematology, microbiology, and immunohematology are taught by instruction in the classroom and laboratory, and thorough clinical experience. Progressive evaluation of competency attainment occurs in the classroom, in laboratories, and at affiliate clinical sites.

Program Goals:

- **Laboratory Precision:** Provide patient care in a diverse health care setting
- **Knowledge:** Demonstrate efficiency in medical and clinical laboratory tasks and general medical knowledge.
- **Clinical:** Perform patient assessment and clinical laboratory procedures.
- **Critical Thinking:** Apply current technologies in clinical laboratory technology to research and retrieve information, discriminate between sources of information, and take action based upon the acquisition of new information and knowledge.
- **Professionalism:** Promote standards of excellence and career-long learning.
- **Ethics:** Demonstrate ethical behavior.

Upon completion of this program of study with a GPA of 2.0 or better, the student is awarded a Medical/Clinical Laboratory Technician Associate's degree.

Graduates may seek career opportunities in clinical laboratory science and continue their education to become a medical technologist/clinical laboratory scientist or laboratory manager. Employment opportunities include laboratories in hospitals, medical offices, blood centers, veterinary labs, and research facilities.

This program is designed to lead to entry-level employment in the industry, or to jobs in related fields, the specific job titles of which may not be that specified in the program title. Although the School will assist students with job placement, finding a job is the individual responsibility of the student. The School does not guarantee that any student will be placed in any of the jobs described, or at all.

Program Overview

**MEDICAL/CLINICAL LABORATORY TECHNICIAN
1790 HOURS/107 QCR. OCCUPATIONAL ASSOCIATE'S DEGREE
PROGRAM OVERVIEW**

	Title	Clock Hours			Total Hours	Quarter Credits	Pre-Req
		Lecture	Lab	Clinical			
	Quarter 1	120	20	00	140	13.0	
CS115	Academic Strategies	30	00	00	30	3.0	
MM201	College Algebra	50	00	00	50	5.0	
SC101	Principles of Biology	40	20	00	60	5.0	
	Quarter 2	110	80	00	190	15.0	
ANA201	Anatomy and Physiology	30	40	00	70	5.0	SC101
CM102	College Composition I	50	00	00	50	5.0	CS115
CLT110	Introduction to Medical/ Clinical Laboratory Technology	30	40	00	70	5.0	SC101, MM201
	Quarter 3	80	40	60	180	12.0	
SC156	Chemistry	40	20	00	60	5.0	
IT133	Software Applications	40	20	00	60	5.0	
CLT290	Phlebotomy Practicum	00	00	60	60	2.0	CLT110
	Quarter 4	100	100	00	200	15.0	
SS124	Psychology	50	00	00	50	5.0	CM102
CLT200	Clinical Hematology	30	60	00	90	6.0	CLT110
CLT150	Urinalysis and Body Fluids	20	40	00	60	4.0	CLT110
	Quarter 5	80	140	00	220	15.0	
CLT170	General Microbiology	30	40	00	70	5.0	SC101
CLT230	Clinical Immunology	20	40	00	60	4.0	CLT110
CLT220	Clinical Chemistry	30	60	00	90	6.0	SC156
	Quarter 6	80	100	00	180	13.0	
CLT250	Clinical Microbiology	30	60	00	90	6.0	CLT170
CLT240	Clinical Immunohematology	20	40	00	60	4.0	CLT230
HU281	Bioethics	30	00	00	30	3.0	

	Title	Clock Hours			Total Hours	Quarter Credits	Pre-Req
		Lecture	Lab	Clinical			
	Quarter 7	20	00	300	320	12.0	
CLT280	Review of Medical/Clinical Laboratory Technology	20	00	00	20	2.0	CLT 150, 200, 220, 240, 250
CLT291	Clinical Practicum I	00	00	300	300	10.0	CLT 150, 200, 220, 240, 250
	Quarter 8	00	00	360	360	12.0	
CLT 292	Clinical Practicum II	00	00	360	360	12.0	CLT 150, 200, 220, 240, 250
	Total	590	480	720	1790	107.0	

Syllabus



Syllabi are updated on a periodic basis to accommodate textbook edition changes and other issues. Please retrieve the syllabus for this module from the Instructor SharePoint site. Please contact your Director of Education for access instructions. Consult the Curriculum Index to ensure that you are using the most recent version.

Textbooks and Resources List



Textbooks and Resources lists are updated on a periodic basis to accommodate textbook edition changes and other issues. Please retrieve the Textbooks and Resources list for this module from the Instructor SharePoint site. Please contact your Director of Education for access instructions. Consult the Curriculum Index to ensure that you are using the most recent version.

Weekly Calendar

Week	Topics	Lab Activities/Exercises	Competencies	Additional Resources
1	Orientation to A & P Basic Chemistry (Marieb Ch.1–2)			
2	Cells & Tissues Integumentary System (Marieb Ch. 3–4)	Microscopic study of tissues		
3	Skeletal System Muscular System (Marieb Ch.5–6)	Work with anatomical models		
4	Nervous System Endocrine System (Marieb Ch. 7, 9)			
5	Blood Lymphatic System (Marieb Ch. 10, 12) Mid-Term Exam	Blood Typing		
6	Cardiovascular System (Marieb Ch. 11)	Heart dissection Blood pressure		

Week	Topics	Lab Activities/Exercises	Competencies	Additional Resources
7	Respiratory System (Marieb Ch. 13)			
8	Urinary System (Marieb Ch. 15)	Urinalysis		
9	Digestive System Reproductive System (Marieb Ch. 14, 16)			
10	This week is intended to be used to complete any material remaining for the course. Additionally, all the outcomes from week 1 to week 9 should be reviewed. Final Exam			

Exams/Quizzes and Answers

- Anatomy and Physiology Mid-Term Exam
- Anatomy and Physiology Mid-Term Exam Answers
- Anatomy and Physiology Final Exam
- Anatomy and Physiology Final Exam Answers
- Anatomy and Physiology Mid-Term Exam (Alternate)
- Anatomy and Physiology Mid-Term Exam Answers (Alternate)
- Anatomy and Physiology Final Exam (Alternate)
- Anatomy and Physiology Final Exam Answers (Alternate)

Name _____ Date _____

Anatomy and Physiology Mid-Term Exam

Multiple Choice

Directions: Circle the letter of the answer that best answers the question and/or completes the statement.

1. Which of the following is NOT a ventral cavity:
 - a. pelvic cavity
 - b. thoracic cavity
 - c. abdominal cavity
 - d. oral cavity
 - e. spinal cavity

2. Which of the following is a dorsal body landmark:
 - a. sternal region
 - b. patellar region
 - c. scapular region
 - d. pubic region
 - e. thoracic region

3. Which one of the following DNA bases are complementary?
 - a. guanine and uracil
 - b. thymine and guanine
 - c. adenine and guanine
 - d. cytosine and adenine
 - e. adenine and thymine

4. Which of the following substances below is matched with its correct organic group:
 - a. enzymes — proteins
 - b. DNA — lipids
 - c. steroids — carbohydrates
 - d. glycerol — proteins
 - e. monosaccharides — nucleic acids

5. The cell connections that allow substances to pass directly from one cell into another are called:
- microvilli
 - tight junctions
 - desmosomes
 - gap junctions
 - inclusions
6. Cholesterol is used in the cell membrane to:
- help make the membrane more rigid
 - allow carbohydrates to pass through the membrane
 - assist in cell recognition by the immune system
 - provide the medium in which protein molecules float
 - help make the membrane more fluid
7. Which of the following do not involve the movement of molecules from an area of greater concentration to an area of lower concentration:
- simple diffusion
 - osmosis
 - diffusion
 - facilitated diffusion
 - filtration
8. Place the four steps in DNA replication in the proper sequence:
- DNA separates into its two nucleotide chains
 - two DNA molecules are formed that are identical to the original DNA helix
 - DNA helix unwinds
 - each strand acts as a template for building a new complementary strand
- 4, 1, 3, 2
 - 2, 4, 1, 3
 - 3, 1, 4, 2
 - 4, 3, 1, 2
 - 1, 2, 4, 3
9. Sebaceous glands are important for:
- body heat regulation
 - production of vitamin D
 - keeping skin and hair cells soft and flexible
 - production of keratin
 - production of sweat

10. Examples of cartilaginous joints are the _____, whereas examples of fibrous joints are the _____.
- pubic symphyses; syndesmoses
 - sutures; intervertebral joints
 - syndesmoses; pubic symphyses
 - diarthroses; sutures
 - pubic symphyses; diarthroses
11. The axial skeleton contains:
- the shoulder and pelvic girdles
 - only flat bones
 - the skull, vertebral column, and pelvis
 - the skull, vertebral column, ribs, and sternum
 - arms, legs, hands, and feet
12. There are _____ lumbar vertebra, whereas there are _____ thoracic vertebra.
- 7; 5
 - 5; 7
 - 5; 12
 - 12; 7
 - 12; 5
13. The mechanical force of contraction is generated by:
- shortening of the thick filaments
 - the temporary disappearance of thin filaments
 - the "accordian-like" folding of thin and thick filaments
 - shortening of the thin filaments
 - a sliding of thin filaments past thick ones
14. Which of the following is the correct sequence in a typical reflex arc:
- effector, efferent neuron, integration center, afferent neuron, receptor
 - effector, afferent neuron, integration center, efferent neuron, receptor
 - receptor, afferent neuron, efferent neuron, integration center, effector
 - receptor, afferent neuron, integration center, efferent neuron, effector
 - receptor, efferent neuron, integration center, afferent neuron, effector

15. The sciatic nerve is the largest nerve in the body resulting from a combination of which two nerves:
- femoral and tibial nerves
 - common fibular and tibial nerves
 - pubental and tibial nerves
 - pubental and femoral nerves
 - pubental and common peroneal nerves
16. Blood cell formation in adults occurs in all of the following EXCEPT the:
- the epiphyseal plates
 - flat bones of the skull
 - proximal epiphyses of the humerus and femur
 - flat bones of the pelvis
 - shaft of the femur
17. The occipital region is the:
- shoulder blade region
 - posterior knee area
 - curve of the shoulder
 - buttock
 - posterior surface of the head
18. The ribs are located in the:
- right and left lumbar regions
 - right and left pubic regions
 - right and left hypochondriac regions
 - right and left iliac regions
 - right and left inguinal regions
19. Which of the following statements is correct regarding the electrical charge of subatomic particles:
- protons are neutral, electrons are negatively charged, and neutrons are positively charged
 - protons are positively charged, electrons are neutral, and neutrons are negatively charged
 - protons are negatively charged, electrons are neutral, and neutrons are negatively charged
 - protons are negatively charged, electrons are positively charged, and neutrons are neutral
 - protons are positively charged, electrons are negatively charged, and neutrons are neutral

20. Which of the following is NOT connective tissue:
- a. adipose
 - b. blood
 - c. skeletal muscle
 - d. cartilage
 - e. bone
21. Vertebrae are considered _____ bones, whereas ankle bones are considered _____.
- a. flat; short
 - b. short; flat
 - c. irregular; short
 - d. short; irregular
 - e. compact; spongy
22. A muscle located on the dorsal side of the body is the:
- a. external intercostals
 - b. pectoralis major
 - c. rectus abdominis
 - d. trapezius
 - e. rectus femoris
23. The right lymphatic duct drains lymph from the
- a. left lower quadrant
 - b. left upper quadrant
 - c. right upper quadrant
 - d. right lower quadrant
 - e. right upper and lower quadrants
24. Which of the following is found in the dermis:
- a. stratum corneum
 - b. melanocytes
 - c. adipose cells
 - d. keratin
 - e. sweat and oil glands

25. Which of the following is NOT a function of the muscular system:
- a. production of movement
 - b. stabilization of joints
 - c. generation of heat
 - d. maintenance of posture
 - e. hematopoiesis

Name _____ Date _____

Anatomy and Physiology Mid-Term Exam Answers

Multiple Choice

Directions: Circle the letter of the answer that best answers the question and/or completes the statement.

1. Which of the following is NOT a ventral cavity:
 - a. pelvic cavity
 - b. thoracic cavity
 - c. abdominal cavity
 - d. oral cavity
 - e. spinal cavity**

2. Which of the following is a dorsal body landmark:
 - a. sternal region
 - b. patellar region
 - c. scapular region**
 - d. pubic region
 - e. thoracic region

3. Which one of the following DNA bases are complementary?
 - a. guanine and uracil
 - b. thymine and guanine
 - c. adenine and guanine
 - d. cytosine and adenine
 - e. adenine and thymine**

4. Which of the following substances below is matched with its correct organic group:
 - a. enzymes — proteins**
 - b. DNA — lipids
 - c. steroids — carbohydrates
 - d. glycerol — proteins
 - e. monosaccharides — nucleic acids

5. The cell connections that allow substances to pass directly from one cell into another are called:
- microvilli
 - tight junctions
 - desmosomes
 - gap junctions**
 - inclusions
6. Cholesterol is used in the cell membrane to:
- help make the membrane more rigid
 - allow carbohydrates to pass through the membrane
 - assist in cell recognition by the immune system
 - provide the medium in which protein molecules float
 - help make the membrane more fluid**
7. Which of the following do not involve the movement of molecules from an area of greater concentration to an area of lower concentration:
- simple diffusion
 - osmosis
 - diffusion
 - facilitated diffusion
 - filtration**
8. Place the four steps in DNA replication in the proper sequence:
- DNA separates into its two nucleotide chains
 - two DNA molecules are formed that are identical to the original DNA helix
 - DNA helix unwinds
 - each strand acts as a template for building a new complementary strand
- 4, 1, 3, 2
 - 2, 4, 1, 3
 - 3, 1, 4, 2**
 - 4, 3, 1, 2
 - 1, 2, 4, 3
9. Sebaceous glands are important for:
- body heat regulation
 - production of vitamin D
 - keeping skin and hair cells soft and flexible**
 - production of keratin
 - production of sweat

10. Examples of cartilaginous joints are the _____, whereas examples of fibrous joints are the _____.
- pubic symphyses; syndesmoses**
 - sutures; intervertebral joints
 - syndesmoses; pubic symphyses
 - diarthroses; sutures
 - pubic symphyses; diarthroses
11. The axial skeleton contains:
- the shoulder and pelvic girdles
 - only flat bones
 - the skull, vertebral column, and pelvis
 - the skull, vertebral column, ribs, and sternum**
 - arms, legs, hands, and feet
12. There are _____ lumbar vertebra, whereas there are _____ thoracic vertebra.
- 7; 5
 - 5; 7
 - 5; 12**
 - 12; 7
 - 12; 5
13. The mechanical force of contraction is generated by:
- shortening of the thick filaments
 - the temporary disappearance of thin filaments
 - the "accordion-like" folding of thin and thick filaments
 - shortening of the thin filaments
 - a sliding of thin filaments past thick ones**
14. Which of the following is the correct sequence in a typical reflex arc:
- effector, efferent neuron, integration center, afferent neuron, receptor
 - effector, afferent neuron, integration center, efferent neuron, receptor
 - receptor, afferent neuron, efferent neuron, integration center, effector
 - receptor, afferent neuron, integration center, efferent neuron, effector**
 - receptor, efferent neuron, integration center, afferent neuron, effector

15. The sciatic nerve is the largest nerve in the body resulting from a combination of which two nerves:
- a. femoral and tibial nerves
 - b. common fibular and tibial nerves**
 - c. pudendal and tibial nerves
 - d. pudendal and femoral nerves
 - e. pudendal and common peroneal nerves
16. Blood cell formation in adults occurs in all of the following EXCEPT the:
- a. the epiphyseal plates
 - b. flat bones of the skull
 - c. proximal epiphyses of the humerus and femur
 - d. flat bones of the pelvis
 - e. shaft of the femur**
17. The occipital region is the:
- a. shoulder blade region
 - b. posterior knee area
 - c. curve of the shoulder
 - d. buttock
 - e. posterior surface of the head**
18. The ribs are located in the:
- a. right and left lumbar regions
 - b. right and left pubic regions
 - c. right and left hypochondriac regions**
 - d. right and left iliac regions
 - e. right and left inguinal regions
19. Which of the following statements is correct regarding the electrical charge of subatomic particles:
- a. protons are neutral, electrons are negatively charged, and neutrons are positively charged
 - b. protons are positively charged, electrons are neutral, and neutrons are negatively charged
 - c. protons are negatively charged, electrons are neutral, and neutrons are negatively charged
 - d. protons are negatively charged, electrons are positively charged, and neutrons are neutral
 - e. protons are positively charged, electrons are negatively charged, and neutrons are neutral**

20. Which of the following is NOT connective tissue:
- a. adipose
 - b. blood
 - c. skeletal muscle**
 - d. cartilage
 - e. bone
21. Vertebrae are considered _____ bones, whereas ankle bones are considered _____.
- a. flat; short
 - b. short; flat
 - c. irregular; short**
 - d. short; irregular
 - e. compact; spongy
22. A muscle located on the dorsal side of the body is the:
- a. external intercostals
 - b. pectoralis major
 - c. rectus abdominis
 - d. trapezius**
 - e. rectus femoris
23. The right lymphatic duct drains lymph from the
- a. left lower quadrant
 - b. left upper quadrant
 - c. right upper quadrant**
 - d. right lower quadrant
 - e. right upper and lower quadrants
24. Which of the following is found in the dermis:
- a. stratum corneum
 - b. melanocytes
 - c. adipose cells
 - d. keratin
 - e. sweat and oil glands**

25. Which of the following is NOT a function of the muscular system:

- a. production of movement
- b. stabilization of joints
- c. generation of heat
- d. maintenance of posture
- e. hematopoiesis**

Name _____ Date _____

Anatomy and Physiology Final Exam

Multiple Choice

Directions: Circle the letter of the answer that best answers the question and/or completes the statement.

1. In describing the relationship between the patellar and femoral regions:
 - a. the patellar region is lateral to the femoral region
 - b. the patellar region is distal to the femoral region
 - c. the patellar region is proximal to the femoral region
 - d. the patellar region is superior to the femoral region
 - e. the patellar region is dorsal to the femoral region

2. The structure that delivers digestive enzymes to the small intestine is/are the:
 - a. adrenal glands
 - b. liver
 - c. pharynx
 - d. pancreas
 - e. lymphoid organs

3. Which of the following relationships is incorrect:
 - a. visceral pleura — lines the surface of the lungs
 - b. visceral peritoneum — covers the outer surface of the small intestine
 - c. parietal peritoneum — lines the wall of the abdominal cavity
 - d. parietal pericardium — covers the outer surface of the heart
 - e. parietal pleura — lines the wall of thoracic cavity

4. Although you get wet while swimming, a tough protein within the skin prevents it from soaking up moisture like a sponge. This substance is:
 - a. melanin
 - b. keratin
 - c. carotene
 - d. mucus
 - e. serous fluid

5. Which of the following is correct of the female pelvis when comparing it with the male pelvis:
 - a. the distance between the female ischial spines is greater
 - b. the distance between the female ischial tuberosities is less
 - c. the female iliac bones are less flared
 - d. the angle of the female pubic arch is smaller
 - e. the female pelvis as a whole is deeper, and the bones are heavier and thicker

6. A narrow, slitlike opening on a bone is a:
 - a. foramen
 - b. meatus
 - c. fossa
 - d. facet
 - e. fissure

7. Paralysis of which of the following would make an individual unable to flex the knee:
 - a. hamstring muscle group
 - b. iliopsoas
 - c. sartorius
 - d. gluteal muscle group
 - e. gastrocnemius

8. Neurotransmitters are stored within:
 - a. motor neuron endings
 - b. myofibrils
 - c. synaptic clefts
 - d. motor units
 - e. motor end plates

9. The cerebrospinal fluid:
 - a. is continually formed mostly by the choroid plexuses
 - b. is secreted by the arachnoid villi
 - c. is identical in composition to whole blood
 - d. enters the four ventricles after filling and circulating through the subarachnoid space
 - e. is secreted mostly by the ependymal cells lining the brain ventricles

10. Which one of the following best describes the waxy-appearing material called *myelin*:
- a. a mass of white lipid material that insulates the axon of a neuron
 - b. a lipid-protein (lipoprotein) cell membrane on the outside of axons
 - c. a mass of white lipid material that surrounds the dendrites of a neuron
 - d. an outer membrane on a neuroglial cell
 - e. a mass of white lipid material that surrounds the cell body of a neuron
11. Immediately after an action potential is propagated, which one of the following ions rapidly diffuses out of the cell into the tissue fluid:
- a. calcium
 - b. magnesium
 - c. chloride
 - d. sodium
 - e. potassium
12. The middle coat of the eyeball that contains pigment which prevents light from scattering in the eyeball is the:
- a. retina
 - b. sclera
 - c. cornea
 - d. pupil
 - e. choroid
13. Tetany resulting from uncontrolled muscle spasms may indicate a malfunction of the:
- a. thymus
 - b. pineal gland
 - c. parathyroid glands
 - d. adrenal cortex
 - e. posterior pituitary
14. In men, luteinizing hormone is also called:
- a. interstitial cell-stimulating hormone
 - b. adrenocorticotrophic hormone
 - c. testosterone
 - d. androgen
 - e. follicle-stimulating hormone

15. The hormone that triggers ovulation of an egg from the female ovary is:
- interstitial cell-stimulating hormone
 - luteinizing hormone
 - progesterone
 - follicle-stimulating hormone
 - prolactin
16. The ion essential for blood clotting is:
- potassium
 - calcium
 - sodium
 - iodine
 - hydrogen
17. In ABO blood typing, type B blood would:
- clump with anti-A serum
 - clump with anti-B serum
 - clump with anti-AB serum
 - clump with anti-O serum
 - never clump with antibody serums
18. The brachial vein:
- drains blood from the popliteal vein, then empties that blood into the femoral vein
 - drains blood from the internal jugular vein, then empties that blood into the superior vena cava
 - drains blood from the radial and ulnar veins, then empties that blood into the axillary vein
 - drains blood from the axillary vein, then empties that blood into the superior vena cava
 - drains blood from the popliteal vein, then empties that blood into the external iliac vein
19. Which of the following blood vessels is a direct branch of the ascending aorta:
- carotid artery
 - both the right and left coronary arteries
 - right coronary artery
 - left coronary artery
 - right subclavian artery

20. Which one of the following is the main function of renin and aldosterone:
- a. they are produced when blood pressure rises and have no long-term effect on blood volume and blood pressure
 - b. they are produced whenever blood pressure rises and ultimately cause an increase in blood volume and blood pressure
 - c. they are produced whenever blood pressure falls and ultimately cause a decrease in blood volume and blood pressure
 - d. they are produced whenever blood pressure falls and ultimately cause an increase in blood volume and blood pressure
 - e. they are produced whenever blood pressure rises and ultimately cause a decrease in blood volume and blood pressure
21. Which one of the following blood vessels carries oxygenated blood:
- a. superior vena cava
 - b. pulmonary vein
 - c. coronary sinus
 - d. pulmonary artery
 - e. inferior vena cava
22. Which one of the following is NOT one of the nonspecific body defenses:
- a. the inflammatory response
 - b. natural killer cells
 - c. fever
 - d. antibody production
 - e. intact skin
23. Lymph node structure includes all of the following EXCEPT:
- a. trabeculae that divide the node into compartments
 - b. Peyer's patches found within the fibrous capsule
 - c. sinuses
 - d. an outer cortex
 - e. a central medulla
24. The respiratory conducting passageways perform all of the following functions EXCEPT:
- a. humidify air
 - b. exchange gases
 - c. purify air
 - d. warm incoming air
 - e. allow air to reach the lungs

25. Which one of the following is NOT true of the lungs:
- a. the right lung has three lobes
 - b. the left lung has two lobes
 - c. the bases rest on the diaphragm
 - d. the narrower portion of each lung is called the apex
 - e. both lungs have two lobes
26. Air moving in and out of the lungs is called:
- a. inspiration
 - b. pulmonary ventilation
 - c. expiration
 - d. internal respiration
 - e. external respiration
27. Intrinsic factor in digestion is a stomach secretion needed for absorption of _____ from the small intestine.
- a. vitamin D
 - b. vitamin B12
 - c. vitamin K
 - d. vitamin A
 - e. vitamin C
28. The primary function of the small intestine is:
- a. absorption of water
 - b. waste secretion
 - c. absorption of nutrients
 - d. mineral secretion
 - e. vitamin conversion
29. Of the capillary beds associated with each nephron, the one that is both fed and drained by arterioles is the:
- a. Bowman's capillaries
 - b. pyramidal capillaries
 - c. peritubular capillaries
 - d. glomerulus
 - e. Henle capillaries

30. Many home pregnancy tests assay for _____ within a woman's urine.
- estrogen
 - human chorionic gonadotropin
 - progesterone
 - testosterone
 - luteinizing hormone
31. Mucous membranes are located in the:
- covering of the brain
 - lining of the stomach cavity
 - covering of the heart
 - lining of the abdominal cavity wall
 - joint cavities
32. A compound fracture can be described as when:
- the bone is crushed
 - the broken bone is exposed to the outside
 - the broken bone ends are forced into each other
 - adjacent bones fracture simultaneously
 - the bone is broken into many fragments
33. The hypothalamus:
- is an important auditory and visual relay center
 - is the somatic sensory area
 - mediates sensations
 - contains reflex centers involved with vision and hearing
 - is the thermostat of the body since it regulates body temperature
34. A neuron with a cell body located in the CNS whose primary function is connecting other neurons is called a(n):
- glial cell
 - satellite cell
 - afferent neuron
 - association neuron
 - efferent neuron

35. Insulin has a(n):
- a. tropic effect
 - b. hypoglycemic effect
 - c. hyperglycemic effect
 - d. enzymatic effect
 - e. neurologic effect
36. The mitral valve is normally closed:
- a. when the ventricle is contracting
 - b. when the ventricle is in systole
 - c. when the ventricle is in diastole
 - d. by the movement of blood from the atrium to the ventricle
 - e. when the atrium is contracting
37. How does the wall of a vein differ when compared to an artery:
- a. it is lined by a thin layer of endothelium
 - b. it consists of three coats
 - c. it contains smooth muscle
 - d. the middle coat is relatively thin
 - e. the outer coat is composed largely of collagen fibers
38. Which one of the following is NOT an organ of the alimentary canal:
- a. pharynx
 - b. stomach
 - c. mouth
 - d. teeth
 - e. esophagus
39. The nonselective, passive process performed by the glomerulus that forms blood plasma without blood proteins is called:
- a. tubular reabsorption
 - b. secretion
 - c. absorption
 - d. filtration
 - e. glomerular reabsorption

40. Which one of the following is NOT true of spermatids:
- a. they are nonmotile
 - b. they have no tail
 - c. they have large amounts of cytoplasm
 - d. they have 23 chromosomes
 - e. they are functional sperm
41. The type of tissue that has a matrix that consists of rows of fibroblasts that manufacture collagen fibers is:
- a. dense connective tissue
 - b. adipose tissue
 - c. osseous tissue
 - d. areolar tissue
 - e. loose connective tissue
42. The point at which an impulse from one nerve cell is communicated to another nerve cell is the:
- a. receptor
 - b. collateral branch
 - c. synapse
 - d. cell body
 - e. effector
43. The umbilical vein carries:
- a. metabolic wastes and carbon dioxide from the fetus to the placenta
 - b. oxygen and nutrients from the placenta to the fetus
 - c. oxygen and nutrients from the fetus to the placenta
 - d. metabolic wastes and carbon dioxide from the placenta to the fetus
 - e. blood from the navel into the inferior vena cava
44. Which one of the following is NOT a feature of COPD:
- a. most patients have a genetic predisposition to COPD
 - b. most COPD victims are hypoxic
 - c. most patients have a history of smoking
 - d. dyspnea becomes progressively more severe
 - e. frequent pulmonary infections are common

45. Which one of the following is the middle section of the small intestine:
- a. ascending colon
 - b. descending colon
 - c. ileum
 - d. duodenum
 - e. jejunum
46. The most potent of all mechanisms and substances that the body uses to regulate blood pH are:
- a. the respiratory system controls
 - b. the buffer system
 - c. enzymes
 - d. hormones
 - e. the kidneys
47. Vitamin D can be described as:
- a. taken in via plant products such as wheat germ and green leafy vegetables; may promote wound healing and contribute to fertility (though not proven in humans)
 - b. produced in the skin from a modified cholesterol molecule on exposure to UV radiation; necessary for normal bone growth and function
 - c. derivatives of fatty acids found in cell membranes; various functions include the stimulation of uterine contractions, the regulation of blood pressure, and the control of motility of the gastrointestinal tract
 - d. made available largely by the action of intestinal bacteria; also prevalent in a wide variety of foods, and necessary for the proper clotting of blood
 - e. a constituent of orange-pigmented vegetables (carrots) and fruits (tomatoes), and part of the photoreceptor pigment involved in vision
48. The suture that connects the two parietal bones together is the _____ suture, whereas the suture that connects the parietal bones to the occipital bone is the _____ suture.
- a. sagittal; lambdoid
 - b. coronal; sagittal
 - c. squamosal; lambdoid
 - d. lambdoid; squamosal
 - e. sagittal; coronal
49. The posterior side of the leg and foot is served by which nerve:
- a. peroneal
 - b. tibial
 - c. median
 - d. femoral
 - e. obturator

50. The path of blood flow within the systemic vascular system is:
- a. arterioles, arteries, venules, veins, capillary beds
 - b. arteries, arterioles, capillary beds, veins, venules
 - c. arteries, arterioles, capillary beds, venules, veins
 - d. arterioles, arteries, capillary beds, veins, venules
 - e. arterioles, arteries, capillary beds, venules, veins

Name _____ Date _____

Anatomy and Physiology Final Exam Answers

Multiple Choice

Directions: Circle the letter of the answer that best answers the question and/or completes the statement.

1. In describing the relationship between the patellar and femoral regions:
 - a. the patellar region is lateral to the femoral region
 - b. the patellar region is distal to the femoral region**
 - c. the patellar region is proximal to the femoral region
 - d. the patellar region is superior to the femoral region
 - e. the patellar region is dorsal to the femoral region

2. The structure that delivers digestive enzymes to the small intestine is/are the:
 - a. adrenal glands
 - b. liver
 - c. pharynx
 - d. pancreas**
 - e. lymphoid organs

3. Which of the following relationships is incorrect:
 - a. visceral pleura — lines the surface of the lungs
 - b. visceral peritoneum — covers the outer surface of the small intestine
 - c. parietal peritoneum — lines the wall of the abdominal cavity
 - d. parietal pericardium — covers the outer surface of the heart**
 - e. parietal pleura — lines the wall of thoracic cavity

4. Although you get wet while swimming, a tough protein within the skin prevents it from soaking up moisture like a sponge. This substance is:
 - a. melanin
 - b. keratin**
 - c. carotene
 - d. mucus
 - e. serous fluid

5. Which of the following is correct of the female pelvis when comparing it with the male pelvis:
- a. **the distance between the female ischial spines is greater**
 - b. the distance between the female ischial tuberosities is less
 - c. the female iliac bones are less flared
 - d. the angle of the female pubic arch is smaller
 - e. the female pelvis as a whole is deeper, and the bones are heavier and thicker
6. A narrow, slitlike opening on a bone is a:
- a. foramen
 - b. meatus
 - c. fossa
 - d. facet
 - e. **fissure**
7. Paralysis of which of the following would make an individual unable to flex the knee:
- a. **hamstring muscle group**
 - b. iliopsoas
 - c. sartorius
 - d. gluteal muscle group
 - e. gastrocnemius
8. Neurotransmitters are stored within:
- a. **motor neuron endings**
 - b. myofibrils
 - c. synaptic clefts
 - d. motor units
 - e. motor end plates
9. The cerebrospinal fluid:
- a. **is continually formed mostly by the choroid plexuses**
 - b. is secreted by the arachnoid villi
 - c. is identical in composition to whole blood
 - d. enters the four ventricles after filling and circulating through the subarachnoid space
 - e. is secreted mostly by the ependymal cells lining the brain ventricles

10. Which one of the following best describes the waxy-appearing material called *myelin*:
- a. **a mass of white lipid material that insulates the axon of a neuron**
 - b. a lipid-protein (lipoprotein) cell membrane on the outside of axons
 - c. a mass of white lipid material that surrounds the dendrites of a neuron
 - d. an outer membrane on a neuroglial cell
 - e. a mass of white lipid material that surrounds the cell body of a neuron
11. Immediately after an action potential is propagated, which one of the following ions rapidly diffuses out of the cell into the tissue fluid:
- a. calcium
 - b. magnesium
 - c. chloride
 - d. sodium
 - e. **potassium**
12. The middle coat of the eyeball that contains pigment which prevents light from scattering in the eyeball is the:
- a. retina
 - b. sclera
 - c. cornea
 - d. pupil
 - e. **choroid**
13. Tetany resulting from uncontrolled muscle spasms may indicate a malfunction of the:
- a. thymus
 - b. pineal gland
 - c. **parathyroid glands**
 - d. adrenal cortex
 - e. posterior pituitary
14. In men, luteinizing hormone is also called:
- a. **interstitial cell-stimulating hormone**
 - b. adrenocorticotrophic hormone
 - c. testosterone
 - d. androgen
 - e. follicle-stimulating hormone

15. The hormone that triggers ovulation of an egg from the female ovary is:
- a. interstitial cell-stimulating hormone
 - b. luteinizing hormone**
 - c. progesterone
 - d. follicle-stimulating hormone
 - e. prolactin
16. The ion essential for blood clotting is:
- a. potassium
 - b. calcium**
 - c. sodium
 - d. iodine
 - e. hydrogen
17. In ABO blood typing, type B blood would:
- a. clump with anti-A serum
 - b. clump with anti-B serum**
 - c. clump with anti-AB serum
 - d. clump with anti-O serum
 - e. never clump with antibody serums
18. The brachial vein:
- a. drains blood from the popliteal vein, then empties that blood into the femoral vein
 - b. drains blood from the internal jugular vein, then empties that blood into the superior vena cava
 - c. drains blood from the radial and ulnar veins, then empties that blood into the axillary vein**
 - d. drains blood from the axillary vein, then empties that blood into the superior vena cava
 - e. drains blood from the popliteal vein, then empties that blood into the external iliac vein
19. Which of the following blood vessels is a direct branch of the ascending aorta:
- a. carotid artery
 - b. both the right and left coronary arteries**
 - c. right coronary artery
 - d. left coronary artery
 - e. right subclavian artery

20. Which one of the following is the main function of renin and aldosterone:
- a. they are produced when blood pressure rises and have no long-term effect on blood volume and blood pressure
 - b. they are produced whenever blood pressure rises and ultimately cause an increase in blood volume and blood pressure
 - c. they are produced whenever blood pressure falls and ultimately cause a decrease in blood volume and blood pressure
 - d. they are produced whenever blood pressure falls and ultimately cause an increase in blood volume and blood pressure**
 - e. they are produced whenever blood pressure rises and ultimately cause a decrease in blood volume and blood pressure
21. Which one of the following blood vessels carries oxygenated blood:
- a. superior vena cava
 - b. pulmonary vein**
 - c. coronary sinus
 - d. pulmonary artery
 - e. inferior vena cava
22. Which one of the following is NOT one of the nonspecific body defenses:
- a. the inflammatory response
 - b. natural killer cells
 - c. fever
 - d. antibody production**
 - e. intact skin
23. Lymph node structure includes all of the following EXCEPT:
- a. trabeculae that divide the node into compartments
 - b. Peyer's patches found within the fibrous capsule**
 - c. sinuses
 - d. an outer cortex
 - e. a central medulla
24. The respiratory conducting passageways perform all of the following functions EXCEPT:
- a. humidify air
 - b. exchange gases**
 - c. purify air
 - d. warm incoming air
 - e. allow air to reach the lungs

25. Which one of the following is NOT true of the lungs:
- a. the right lung has three lobes
 - b. the left lung has two lobes
 - c. the bases rest on the diaphragm
 - d. the narrower portion of each lung is called the apex
 - e. both lungs have two lobes**
26. Air moving in and out of the lungs is called:
- a. inspiration
 - b. pulmonary ventilation**
 - c. expiration
 - d. internal respiration
 - e. external respiration
27. Intrinsic factor in digestion is a stomach secretion needed for absorption of _____ from the small intestine.
- a. vitamin D
 - b. vitamin B12**
 - c. vitamin K
 - d. vitamin A
 - e. vitamin C
28. The primary function of the small intestine is:
- a. absorption of water
 - b. waste secretion
 - c. absorption of nutrients**
 - d. mineral secretion
 - e. vitamin conversion
29. Of the capillary beds associated with each nephron, the one that is both fed and drained by arterioles is the:
- a. Bowman's capillaries
 - b. pyramidal capillaries
 - c. peritubular capillaries
 - d. glomerulus**
 - e. Henle capillaries

30. Many home pregnancy tests assay for _____ within a woman's urine.
- a. estrogen
 - b. human chorionic gonadotropin**
 - c. progesterone
 - d. testosterone
 - e. luteinizing hormone
31. Mucous membranes are located in the:
- a. covering of the brain
 - b. lining of the stomach cavity**
 - c. covering of the heart
 - d. lining of the abdominal cavity wall
 - e. joint cavities
32. A compound fracture can be described as when:
- a. the bone is crushed
 - b. the broken bone is exposed to the outside**
 - c. the broken bone ends are forced into each other
 - d. adjacent bones fracture simultaneously
 - e. the bone is broken into many fragments
33. The hypothalamus:
- a. is an important auditory and visual relay center
 - b. is the somatic sensory area
 - c. mediates sensations
 - d. contains reflex centers involved with vision and hearing
 - e. is the thermostat of the body since it regulates body temperature**
34. A neuron with a cell body located in the CNS whose primary function is connecting other neurons is called a(n):
- a. glial cell
 - b. satellite cell
 - c. afferent neuron
 - d. association neuron**
 - e. efferent neuron

35. Insulin has a(n):
- a. tropic effect
 - b. hypoglycemic effect**
 - c. hyperglycemic effect
 - d. enzymatic effect
 - e. neurologic effect
36. The mitral valve is normally closed:
- a. when the ventricle is contracting
 - b. when the ventricle is in systole**
 - c. when the ventricle is in diastole
 - d. by the movement of blood from the atrium to the ventricle
 - e. when the atrium is contracting
37. How does the wall of a vein differ when compared to an artery:
- a. it is lined by a thin layer of endothelium
 - b. it consists of three coats
 - c. it contains smooth muscle
 - d. the middle coat is relatively thin**
 - e. the outer coat is composed largely of collagen fibers
38. Which one of the following is NOT an organ of the alimentary canal:
- a. pharynx
 - b. stomach
 - c. mouth
 - d. teeth**
 - e. esophagus
39. The nonselective, passive process performed by the glomerulus that forms blood plasma without blood proteins is called:
- a. tubular reabsorption
 - b. secretion
 - c. absorption
 - d. filtration**
 - e. glomerular reabsorption

40. Which one of the following is NOT true of spermatids:
- a. they are nonmotile
 - b. they have no tail
 - c. they have large amounts of cytoplasm
 - d. they have 23 chromosomes
 - e. they are functional sperm**
41. The type of tissue that has a matrix that consists of rows of fibroblasts that manufacture collagen fibers is:
- a. dense connective tissue**
 - b. adipose tissue
 - c. osseous tissue
 - d. areolar tissue
 - e. loose connective tissue
42. The point at which an impulse from one nerve cell is communicated to another nerve cell is the:
- a. receptor
 - b. collateral branch
 - c. synapse**
 - d. cell body
 - e. effector
43. The umbilical vein carries:
- a. metabolic wastes and carbon dioxide from the fetus to the placenta
 - b. oxygen and nutrients from the placenta to the fetus**
 - c. oxygen and nutrients from the fetus to the placenta
 - d. metabolic wastes and carbon dioxide from the placenta to the fetus
 - e. blood from the navel into the inferior vena cava
44. Which one of the following is NOT a feature of COPD:
- a. most patients have a genetic predisposition to COPD**
 - b. most COPD victims are hypoxic
 - c. most patients have a history of smoking
 - d. dyspnea becomes progressively more severe
 - e. frequent pulmonary infections are common

45. Which one of the following is the middle section of the small intestine:
- ascending colon
 - descending colon
 - ileum
 - duodenum
 - jejunum**
46. The most potent of all mechanisms and substances that the body uses to regulate blood pH are:
- the respiratory system controls
 - the buffer system
 - enzymes
 - hormones
 - the kidneys**
47. Vitamin D can be described as:
- taken in via plant products such as wheat germ and green leafy vegetables; may promote wound healing and contribute to fertility (though not proven in humans)
 - produced in the skin from a modified cholesterol molecule on exposure to UV radiation; necessary for normal bone growth and function**
 - derivatives of fatty acids found in cell membranes; various functions include the stimulation of uterine contractions, the regulation of blood pressure, and the control of motility of the gastrointestinal tract
 - made available largely by the action of intestinal bacteria; also prevalent in a wide variety of foods, and necessary for the proper clotting of blood
 - a constituent of orange-pigmented vegetables (carrots) and fruits (tomatoes), and part of the photoreceptor pigment involved in vision
48. The suture that connects the two parietal bones together is the _____ suture, whereas the suture that connects the parietal bones to the occipital bone is the _____ suture.
- sagittal; lambdoid**
 - coronal; sagittal
 - squamosal; lambdoid
 - lambdoid; squamosal
 - sagittal; coronal
49. The posterior side of the leg and foot is served by which nerve:
- peroneal
 - tibial**
 - median
 - femoral
 - obturator

50. The path of blood flow within the systemic vascular system is:
- a. arterioles, arteries, venules, veins, capillary beds
 - b. arteries, arterioles, capillary beds, veins, venules
 - c. arteries, arterioles, capillary beds, venules, veins**
 - d. arterioles, arteries, capillary beds, veins, venules
 - e. arterioles, arteries, capillary beds, venules, veins

Name _____ Date _____

Anatomy and Physiology Mid-Term Exam (Alternate)

Multiple Choice

Directions: Circle the letter of the answer that best answers the question and/or completes the statement.

1. Sebaceous glands are important for:
 - a. body heat regulation
 - b. production of vitamin D
 - c. keeping skin and hair cells soft and flexible
 - d. production of keratin
 - e. production of sweat

2. Place the four steps in DNA replication in the proper sequence:
 1. DNA separates into its two nucleotide chains
 2. two DNA molecules are formed that are identical to the original DNA helix
 3. DNA helix unwinds
 4. each strand acts as a template for building a new complementary strand
 - a. 4, 1, 3, 2
 - b. 2, 4, 1, 3
 - c. 3, 1, 4, 2
 - d. 4, 3, 1, 2
 - e. 1, 2, 4, 3

3. Cholesterol is used in the cell membrane to:
 - a. help make the membrane more rigid
 - b. allow carbohydrates to pass through the membrane
 - c. assist in cell recognition by the immune system
 - d. provide the medium in which protein molecules float
 - e. help make the membrane more fluid

4. Which of the following do not involve the movement of molecules from an area of greater concentration to an area of lower concentration:
 - a. simple diffusion
 - b. osmosis
 - c. diffusion
 - d. facilitated diffusion
 - e. filtration

5. Which of the following substances below is matched with its correct organic group:
 - a. enzymes — proteins
 - b. DNA — lipids
 - c. steroids — carbohydrates
 - d. glycerol — proteins
 - e. monosaccharides — nucleic acids

6. Which one of the following DNA bases are complementary?
 - a. guanine and uracil
 - b. thymine and guanine
 - c. adenine and guanine
 - d. cytosine and adenine
 - e. adenine and thymine

7. Which of the following is a dorsal body landmark:
 - a. sternal region
 - b. patellar region
 - c. scapular region
 - d. pubic region
 - e. thoracic region

8. Which of the following is NOT a ventral cavity:
 - a. pelvic cavity
 - b. thoracic cavity
 - c. abdominal cavity
 - d. oral cavity
 - e. spinal cavity

9. The cell connections that allow substances to pass directly from one cell into another are called:
- microvilli
 - tight junctions
 - desmosomes
 - gap junctions
 - inclusions
10. Which of the following statements is correct regarding the electrical charge of subatomic particles:
- protons are neutral, electrons are negatively charged, and neutrons are positively charged
 - protons are positively charged, electrons are neutral, and neutrons are negatively charged
 - protons are negatively charged, electrons are neutral, and neutrons are negatively charged
 - protons are negatively charged, electrons are positively charged, and neutrons are neutral
 - protons are positively charged, electrons are negatively charged, and neutrons are neutral
11. The ribs are located in the:
- right and left lumbar regions
 - right and left pubic regions
 - right and left hypochondriac regions
 - right and left iliac regions
 - right and left inguinal regions
12. The occipital region is the:
- shoulder blade region
 - posterior knee area
 - curve of the shoulder
 - buttock
 - posterior surface of the head
13. Blood cell formation in adults occurs in all of the following EXCEPT the:
- the epiphyseal plates
 - flat bones of the skull
 - proximal epiphyses of the humerus and femur
 - flat bones of the pelvis
 - shaft of the femur

14. The sciatic nerve is the largest nerve in the body resulting from a combination of which two nerves:
- femoral and tibial nerves
 - common fibular and tibial nerves
 - pubdental and tibial nerves
 - pubdental and femoral nerves
 - pubdental and common peroneal nerves
15. Which of the following is the correct sequence in a typical reflex arc:
- effector, efferent neuron, integration center, afferent neuron, receptor
 - effector, afferent neuron, integration center, efferent neuron, receptor
 - receptor, afferent neuron, efferent neuron, integration center, effector
 - receptor, afferent neuron, integration center, efferent neuron, effector
 - receptor, efferent neuron, integration center, afferent neuron, effector
16. The mechanical force of contraction is generated by:
- shortening of the thick filaments
 - the temporary disappearance of thin filaments
 - the "accordion-like" folding of thin and thick filaments
 - shortening of the thin filaments
 - a sliding of thin filaments past thick ones
17. There are _____ lumbar vertebra, whereas there are _____ thoracic vertebra.
- 7; 5
 - 5; 7
 - 5; 12
 - 12; 7
 - 12; 5
18. The axial skeleton contains:
- the shoulder and pelvic girdles
 - only flat bones
 - the skull, vertebral column, and pelvis
 - the skull, vertebral column, ribs, and sternum
 - arms, legs, hands, and feet

19. Examples of cartilaginous joints are the _____, whereas examples of fibrous joints are the _____.
- pubic symphyses; syndesmoses
 - sutures; intervertebral joints
 - syndesmoses; pubic symphyses
 - diarthroses; sutures
 - pubic symphyses; diarthroses
20. Which of the following is NOT a function of the muscular system:
- production of movement
 - stabilization of joints
 - generation of heat
 - maintenance of posture
 - hematopoiesis
21. Which of the following is found in the dermis:
- stratum corneum
 - melanocytes
 - adipose cells
 - keratin
 - sweat and oil glands
22. The right lymphatic duct drains lymph from the
- left lower quadrant
 - left upper quadrant
 - right upper quadrant
 - right lower quadrant
 - right upper and lower quadrants
23. A muscle located on the dorsal side of the body is the:
- external intercostals
 - pectoralis major
 - rectus abdominis
 - trapezius
 - rectus femoris

24. Vertebrae are considered _____ bones, whereas ankle bones are considered _____.
- a. flat; short
 - b. short; flat
 - c. irregular; short
 - d. short; irregular
 - e. compact; spongy
25. Which of the following is NOT connective tissue:
- a. adipose
 - b. blood
 - c. skeletal muscle
 - d. cartilage
 - e. bone

Name _____ Date _____

Anatomy and Physiology Mid-Term Exam Answers (Alternate)

Multiple Choice

Directions: Circle the letter of the answer that best answers the question and/or completes the statement.

1. Sebaceous glands are important for:
 - a. body heat regulation
 - b. production of vitamin D
 - c. keeping skin and hair cells soft and flexible**
 - d. production of keratin
 - e. production of sweat

2. Place the four steps in DNA replication in the proper sequence:
 1. DNA separates into its two nucleotide chains
 2. two DNA molecules are formed that are identical to the original DNA helix
 3. DNA helix unwinds
 4. each strand acts as a template for building a new complementary strand
 - a. 4, 1, 3, 2
 - b. 2, 4, 1, 3
 - c. 3, 1, 4, 2**
 - d. 4, 3, 1, 2
 - e. 1, 2, 4, 3

3. Cholesterol is used in the cell membrane to:
 - a. help make the membrane more rigid
 - b. allow carbohydrates to pass through the membrane
 - c. assist in cell recognition by the immune system
 - d. provide the medium in which protein molecules float
 - e. help make the membrane more fluid**

4. Which of the following do not involve the movement of molecules from an area of greater concentration to an area of lower concentration:
- a. simple diffusion
 - b. osmosis
 - c. diffusion
 - d. facilitated diffusion
 - e. filtration**
5. Which of the following substances below is matched with its correct organic group:
- a. enzymes — proteins**
 - b. DNA — lipids
 - c. steroids — carbohydrates
 - d. glycerol — proteins
 - e. monosaccharides — nucleic acids
6. Which one of the following DNA bases are complementary?
- a. guanine and uracil
 - b. thymine and guanine
 - c. adenine and guanine
 - d. cytosine and adenine
 - e. adenine and thymine**
7. Which of the following is a dorsal body landmark:
- a. sternal region
 - b. patellar region
 - c. scapular region**
 - d. pubic region
 - e. thoracic region
8. Which of the following is NOT a ventral cavity:
- a. pelvic cavity
 - b. thoracic cavity
 - c. abdominal cavity
 - d. oral cavity
 - e. spinal cavity**

9. The cell connections that allow substances to pass directly from one cell into another are called:
- a. microvilli
 - b. tight junctions
 - c. desmosomes
 - d. gap junctions**
 - e. inclusions
10. Which of the following statements is correct regarding the electrical charge of subatomic particles:
- a. protons are neutral, electrons are negatively charged, and neutrons are positively charged
 - b. protons are positively charged, electrons are neutral, and neutrons are negatively charged
 - c. protons are negatively charged, electrons are neutral, and neutrons are negatively charged
 - d. protons are negatively charged, electrons are positively charged, and neutrons are neutral
 - e. protons are positively charged, electrons are negatively charged, and neutrons are neutral**
11. The ribs are located in the:
- a. right and left lumbar regions
 - b. right and left pubic regions
 - c. right and left hypochondriac regions**
 - d. right and left iliac regions
 - e. right and left inguinal regions
12. The occipital region is the:
- a. shoulder blade region
 - b. posterior knee area
 - c. curve of the shoulder
 - d. buttock
 - e. posterior surface of the head**
13. Blood cell formation in adults occurs in all of the following EXCEPT the:
- a. the epiphyseal plates
 - b. flat bones of the skull
 - c. proximal epiphyses of the humerus and femur
 - d. flat bones of the pelvis
 - e. shaft of the femur**

14. The sciatic nerve is the largest nerve in the body resulting from a combination of which two nerves:
- a. femoral and tibial nerves
 - b. common fibular and tibial nerves**
 - c. pudendal and tibial nerves
 - d. pudendal and femoral nerves
 - e. pudendal and common peroneal nerves
15. Which of the following is the correct sequence in a typical reflex arc:
- a. effector, efferent neuron, integration center, afferent neuron, receptor
 - b. effector, afferent neuron, integration center, efferent neuron, receptor
 - c. receptor, afferent neuron, efferent neuron, integration center, effector
 - d. receptor, afferent neuron, integration center, efferent neuron, effector**
 - e. receptor, efferent neuron, integration center, afferent neuron, effector
16. The mechanical force of contraction is generated by:
- a. shortening of the thick filaments
 - b. the temporary disappearance of thin filaments
 - c. the "accordion-like" folding of thin and thick filaments
 - d. shortening of the thin filaments
 - e. a sliding of thin filaments past thick ones**
17. There are _____ lumbar vertebra, whereas there are _____ thoracic vertebra.
- a. 7; 5
 - b. 5; 7
 - c. 5; 12**
 - d. 12; 7
 - e. 12; 5
18. The axial skeleton contains:
- a. the shoulder and pelvic girdles
 - b. only flat bones
 - c. the skull, vertebral column, and pelvis
 - d. the skull, vertebral column, ribs, and sternum**
 - e. arms, legs, hands, and feet

19. Examples of cartilaginous joints are the _____, whereas examples of fibrous joints are the _____.
- pubic symphyses; syndesmoses**
 - sutures; intervertebral joints
 - syndesmoses; pubic symphyses
 - diarthroses; sutures
 - pubic symphyses; diarthroses
20. Which of the following is NOT a function of the muscular system:
- production of movement
 - stabilization of joints
 - generation of heat
 - maintenance of posture
 - hematopoiesis**
21. Which of the following is found in the dermis:
- stratum corneum
 - melanocytes
 - adipose cells
 - keratin
 - sweat and oil glands**
22. The right lymphatic duct drains lymph from the
- left lower quadrant
 - left upper quadrant
 - right upper quadrant**
 - right lower quadrant
 - right upper and lower quadrants
23. A muscle located on the dorsal side of the body is the:
- external intercostals
 - pectoralis major
 - rectus abdominis
 - trapezius**
 - rectus femoris

24. Vertebrae are considered _____ bones, whereas ankle bones are considered _____.
- a. flat; short
 - b. short; flat
 - c. irregular; short**
 - d. short; irregular
 - e. compact; spongy
25. Which of the following is NOT connective tissue:
- a. adipose
 - b. blood
 - c. skeletal muscle**
 - d. cartilage
 - e. bone

Name _____ Date _____

Anatomy and Physiology Final Exam (Alternate)

Multiple Choice

Directions: Circle the letter of the answer that best answers the question and/or completes the statement.

1. Although you get wet while swimming, a tough protein within the skin prevents it from soaking up moisture like a sponge. This substance is:
 - a. melanin
 - b. keratin
 - c. carotene
 - d. mucus
 - e. serous fluid

2. Which of the following relationships is incorrect:
 - a. visceral pleura — lines the surface of the lungs
 - b. visceral peritoneum — covers the outer surface of the small intestine
 - c. parietal peritoneum — lines the wall of the abdominal cavity
 - d. parietal pericardium — covers the outer surface of the heart
 - e. parietal pleura — lines the wall of thoracic cavity

3. The structure that delivers digestive enzymes to the small intestine is/are the:
 - a. adrenal glands
 - b. liver
 - c. pharynx
 - d. pancreas
 - e. lymphoid organs

4. In describing the relationship between the patellar and femoral regions:
 - a. the patellar region is lateral to the femoral region
 - b. the patellar region is distal to the femoral region
 - c. the patellar region is proximal to the femoral region
 - d. the patellar region is superior to the femoral region
 - e. the patellar region is dorsal to the femoral region

5. Which one of the following best describes the waxy-appearing material called myelin:
 - a. a mass of white lipid material that insulates the axon of a neuron
 - b. a lipid-protein (lipoprotein) cell membrane on the outside of axons
 - c. a mass of white lipid material that surrounds the dendrites of a neuron
 - d. an outer membrane on a neuroglial cell
 - e. a mass of white lipid material that surrounds the cell body of a neuron

6. Neurotransmitters are stored within:
 - a. motor neuron endings
 - b. myofibrils
 - c. synaptic clefts
 - d. motor units
 - e. motor end plates

7. Paralysis of which of the following would make an individual unable to flex the knee:
 - a. hamstring muscle group
 - b. iliopsoas
 - c. sartorius
 - d. gluteal muscle group
 - e. gastrocnemius

8. A narrow, slitlike opening on a bone is a:
 - a. foramen
 - b. meatus
 - c. fossa
 - d. facet
 - e. fissure

9. Which of the following is correct of the female pelvis when comparing it with the male pelvis:
 - a. the distance between the female ischial spines is greater
 - b. the distance between the female ischial tuberosities is less
 - c. the female iliac bones are less flared
 - d. the angle of the female pubic arch is smaller
 - e. the female pelvis as a whole is deeper, and the bones are heavier and thicker

10. The hormone that triggers ovulation of an egg from the female ovary is:
- interstitial cell-stimulating hormone
 - luteinizing hormone
 - progesterone
 - follicle-stimulating hormone
 - prolactin
11. Tetany resulting from uncontrolled muscle spasms may indicate a malfunction of the:
- thymus
 - pineal gland
 - parathyroid glands
 - adrenal cortex
 - posterior pituitary
12. The middle coat of the eyeball that contains pigment which prevents light from scattering in the eyeball is the:
- retina
 - sclera
 - cornea
 - pupil
 - choroid
13. Immediately after an action potential is propagated, which one of the following ions rapidly diffuses out of the cell into the tissue fluid:
- calcium
 - magnesium
 - chloride
 - sodium
 - potassium
14. The cerebrospinal fluid:
- is continually formed mostly by the choroid plexuses
 - is secreted by the arachnoid villi
 - is identical in composition to whole blood
 - enters the four ventricles after filling and circulating through the subarachnoid space
 - is secreted mostly by the ependymal cells lining the brain ventricles

15. Which one of the following is the main function of renin and aldosterone:
- they are produced when blood pressure rises and have no long-term effect on blood volume and blood pressure
 - they are produced whenever blood pressure rises and ultimately cause an increase in blood volume and blood pressure
 - they are produced whenever blood pressure falls and ultimately cause a decrease in blood volume and blood pressure
 - they are produced whenever blood pressure falls and ultimately cause an increase in blood volume and blood pressure
 - they are produced whenever blood pressure rises and ultimately cause a decrease in blood volume and blood pressure
16. The brachial vein:
- drains blood from the popliteal vein, then empties that blood into the femoral vein
 - drains blood from the internal jugular vein, then empties that blood into the superior vena cava
 - drains blood from the radial and ulnar veins, then empties that blood into the axillary vein
 - drains blood from the axillary vein, then empties that blood into the superior vena cava
 - drains blood from the popliteal vein, then empties that blood into the external iliac vein
17. In ABO blood typing, type B blood would:
- clump with anti-A serum
 - clump with anti-B serum
 - clump with anti-AB serum
 - clump with anti-O serum
 - never clump with antibody serums
18. The ion essential for blood clotting is:
- potassium
 - calcium
 - sodium
 - iodine
 - hydrogen
19. In men, luteinizing hormone is also called:
- interstitial cell-stimulating hormone
 - adrenocorticotrophic hormone
 - testosterone
 - androgen
 - follicle-stimulating hormone

20. Which one of the following is NOT true of the lungs:
- a. the right lung has three lobes
 - b. the left lung has two lobes
 - c. the bases rest on the diaphragm
 - d. the narrower portion of each lung is called the apex
 - e. both lungs have two lobes
21. Lymph node structure includes all of the following EXCEPT:
- a. trabeculae that divide the node into compartments
 - b. Peyer's patches found within the fibrous capsule
 - c. sinuses
 - d. an outer cortex
 - e. a central medulla
22. Which one of the following is NOT one of the nonspecific body defenses:
- a. the inflammatory response
 - b. natural killer cells
 - c. fever
 - d. antibody production
 - e. intact skin
23. Which one of the following blood vessels carries oxygenated blood:
- a. superior vena cava
 - b. pulmonary vein
 - c. coronary sinus
 - d. pulmonary artery
 - e. inferior vena cava
24. Which of the following blood vessels is a direct branch of the ascending aorta:
- a. carotid artery
 - b. both the right and left coronary arteries
 - c. right coronary artery
 - d. left coronary artery
 - e. right subclavian artery

25. Many home pregnancy tests assay for _____ within a woman's urine.
- a. estrogen
 - b. human chorionic gonadotropin
 - c. progesterone
 - d. testosterone
 - e. luteinizing hormone
26. The primary function of the small intestine is:
- a. absorption of water
 - b. waste secretion
 - c. absorption of nutrients
 - d. mineral secretion
 - e. vitamin conversion
27. Intrinsic factor in digestion is a stomach secretion needed for absorption of _____ from the small intestine.
- a. vitamin D
 - b. vitamin B12
 - c. vitamin K
 - d. vitamin A
 - e. vitamin C
28. Air moving in and out of the lungs is called:
- a. inspiration
 - b. pulmonary ventilation
 - c. expiration
 - d. internal respiration
 - e. external respiration
29. The respiratory conducting passageways perform all of the following functions EXCEPT:
- a. humidify air
 - b. exchange gases
 - c. purify air
 - d. warm incoming air
 - e. allow air to reach the lungs

30. Insulin has a(n):
- a. tropic effect
 - b. hypoglycemic effect
 - c. hyperglycemic effect
 - d. enzymatic effect
 - e. neurologic effect
31. The hypothalamus:
- a. is an important auditory and visual relay center
 - b. is the somatic sensory area
 - c. mediates sensations
 - d. contains reflex centers involved with vision and hearing
 - e. is the thermostat of the body since it regulates body temperature
32. A compound fracture can be described as when:
- a. the bone is crushed
 - b. the broken bone is exposed to the outside
 - c. the broken bone ends are forced into each other
 - d. adjacent bones fracture simultaneously
 - e. the bone is broken into many fragments
33. Mucous membranes are located in the:
- a. covering of the brain
 - b. lining of the stomach cavity
 - c. covering of the heart
 - d. lining of the abdominal cavity wall
 - e. joint cavities
34. Of the capillary beds associated with each nephron, the one that is both fed and drained by arterioles is the:
- a. Bowman's capillaries
 - b. pyramidal capillaries
 - c. peritubular capillaries
 - d. glomerulus
 - e. Henle capillaries

35. Which one of the following is NOT true of spermatids:
- they are nonmotile
 - they have no tail
 - they have large amounts of cytoplasm
 - they have 23 chromosomes
 - they are functional sperm
36. Which one of the following is NOT an organ of the alimentary canal:
- pharynx
 - stomach
 - mouth
 - teeth
 - esophagus
37. How does the wall of a vein differ when compared to an artery:
- it is lined by a thin layer of endothelium
 - it consists of three coats
 - it contains smooth muscle
 - the middle coat is relatively thin
 - the outer coat is composed largely of collagen fibers
38. The mitral valve is normally closed:
- when the ventricle is contracting
 - when the ventricle is in systole
 - when the ventricle is in diastole
 - by the movement of blood from the atrium to the ventricle
 - when the atrium is contracting
39. A neuron with a cell body located in the CNS whose primary function is connecting other neurons is called a(n):
- glial cell
 - satellite cell
 - afferent neuron
 - association neuron
 - efferent neuron

40. Which one of the following is the middle section of the small intestine:
- a. ascending colon
 - b. descending colon
 - c. ileum
 - d. duodenum
 - e. jejunum
41. The umbilical vein carries:
- a. metabolic wastes and carbon dioxide from the fetus to the placenta
 - b. oxygen and nutrients from the placenta to the fetus
 - c. oxygen and nutrients from the fetus to the placenta
 - d. metabolic wastes and carbon dioxide from the placenta to the fetus
 - e. blood from the navel into the inferior vena cava
42. The point at which an impulse from one nerve cell is communicated to another nerve cell is the:
- a. receptor
 - b. collateral branch
 - c. synapse
 - d. cell body
 - e. effector
43. The type of tissue that has a matrix that consists of rows of fibroblasts that manufacture collagen fibers is:
- a. dense connective tissue
 - b. adipose tissue
 - c. osseous tissue
 - d. areolar tissue
 - e. loose connective tissue
44. The nonselective, passive process performed by the glomerulus that forms blood plasma without blood proteins is called:
- a. tubular reabsorption
 - b. secretion
 - c. absorption
 - d. filtration
 - e. glomerular reabsorption

45. The path of blood flow within the systemic vascular system is:
- arterioles, arteries, venules, veins, capillary beds
 - arteries, arterioles, capillary beds, veins, venules
 - arteries, arterioles, capillary beds, venules, veins
 - arterioles, arteries, capillary beds, veins, venules
 - arterioles, arteries, capillary beds, venules, veins
46. The posterior side of the leg and foot is served by which nerve:
- peroneal
 - tibial
 - median
 - femoral
 - obturator
47. The suture that connects the two parietal bones together is the _____ suture, whereas the suture that connects the parietal bones to the occipital bone is the _____ suture.
- sagittal; lambdoid
 - coronal; sagittal
 - squamosal; lambdoid
 - lambdoid; squamosal
 - sagittal; coronal
48. Vitamin D can be described as:
- taken in via plant products such as wheat germ and green leafy vegetables; may promote wound healing and contribute to fertility (though not proven in humans)
 - produced in the skin from a modified cholesterol molecule on exposure to UV radiation; necessary for normal bone growth and function
 - derivatives of fatty acids found in cell membranes; various functions include the stimulation of uterine contractions, the regulation of blood pressure, and the control of motility of the gastrointestinal tract
 - made available largely by the action of intestinal bacteria; also prevalent in a wide variety of foods, and necessary for the proper clotting of blood
 - a constituent of orange-pigmented vegetables (carrots) and fruits (tomatoes), and part of the photoreceptor pigment involved in vision
49. The most potent of all mechanisms and substances that the body uses to regulate blood pH are:
- the respiratory system controls
 - the buffer system
 - enzymes
 - hormones
 - the kidneys

50. Which one of the following is NOT a feature of COPD:
- a. most patients have a genetic predisposition to COPD
 - b. most COPD victims are hypoxic
 - c. most patients have a history of smoking
 - d. dyspnea becomes progressively more severe
 - e. frequent pulmonary infections are common

Name _____ Date _____

Anatomy and Physiology Final Exam Answers (Alternate)

Multiple Choice

Directions: Circle the letter of the answer that best answers the question and/or completes the statement.

1. Although you get wet while swimming, a tough protein within the skin prevents it from soaking up moisture like a sponge. This substance is:
 - a. melanin
 - b. keratin**
 - c. carotene
 - d. mucus
 - e. serous fluid

2. Which of the following relationships is incorrect:
 - a. visceral pleura — lines the surface of the lungs
 - b. visceral peritoneum — covers the outer surface of the small intestine
 - c. parietal peritoneum — lines the wall of the abdominal cavity
 - d. parietal pericardium — covers the outer surface of the heart**
 - e. parietal pleura — lines the wall of thoracic cavity

3. The structure that delivers digestive enzymes to the small intestine is/are the:
 - a. adrenal glands
 - b. liver
 - c. pharynx
 - d. pancreas**
 - e. lymphoid organs

4. In describing the relationship between the patellar and femoral regions:
 - a. the patellar region is lateral to the femoral region
 - b. the patellar region is distal to the femoral region**
 - c. the patellar region is proximal to the femoral region
 - d. the patellar region is superior to the femoral region
 - e. the patellar region is dorsal to the femoral region

5. Which one of the following best describes the waxy-appearing material called *myelin*:
- a. **a mass of white lipid material that insulates the axon of a neuron**
 - b. a lipid-protein (lipoprotein) cell membrane on the outside of axons
 - c. a mass of white lipid material that surrounds the dendrites of a neuron
 - d. an outer membrane on a neuroglial cell
 - e. a mass of white lipid material that surrounds the cell body of a neuron
6. Neurotransmitters are stored within:
- a. **motor neuron endings**
 - b. myofibrils
 - c. synaptic clefts
 - d. motor units
 - e. motor end plates
7. Paralysis of which of the following would make an individual unable to flex the knee:
- a. **hamstring muscle group**
 - b. iliopsoas
 - c. sartorius
 - d. gluteal muscle group
 - e. gastrocnemius
8. A narrow, slitlike opening on a bone is a:
- a. foramen
 - b. meatus
 - c. fossa
 - d. facet
 - e. **fissure**
9. Which of the following is correct of the female pelvis when comparing it with the male pelvis:
- a. **the distance between the female ischial spines is greater**
 - b. the distance between the female ischial tuberosities is less
 - c. the female iliac bones are less flared
 - d. the angle of the female pubic arch is smaller
 - e. the female pelvis as a whole is deeper, and the bones are heavier and thicker

10. The hormone that triggers ovulation of an egg from the female ovary is:
- a. interstitial cell-stimulating hormone
 - b. luteinizing hormone**
 - c. progesterone
 - d. follicle-stimulating hormone
 - e. prolactin
11. Tetany resulting from uncontrolled muscle spasms may indicate a malfunction of the:
- a. thymus
 - b. pineal gland
 - c. parathyroid glands**
 - d. adrenal cortex
 - e. posterior pituitary
12. The middle coat of the eyeball that contains pigment which prevents light from scattering in the eyeball is the:
- a. retina
 - b. sclera
 - c. cornea
 - d. pupil
 - e. choroid**
13. Immediately after an action potential is propagated, which one of the following ions rapidly diffuses out of the cell into the tissue fluid:
- a. calcium
 - b. magnesium
 - c. chloride
 - d. sodium
 - e. potassium**
14. The cerebrospinal fluid:
- a. is continually formed mostly by the choroid plexuses**
 - b. is secreted by the arachnoid villi
 - c. is identical in composition to whole blood
 - d. enters the four ventricles after filling and circulating through the subarachnoid space
 - e. is secreted mostly by the ependymal cells lining the brain ventricles

15. Which one of the following is the main function of renin and aldosterone:
- they are produced when blood pressure rises and have no long-term effect on blood volume and blood pressure
 - they are produced whenever blood pressure rises and ultimately cause an increase in blood volume and blood pressure
 - they are produced whenever blood pressure falls and ultimately cause a decrease in blood volume and blood pressure
 - they are produced whenever blood pressure falls and ultimately cause an increase in blood volume and blood pressure**
 - they are produced whenever blood pressure rises and ultimately cause a decrease in blood volume and blood pressure
16. The brachial vein:
- drains blood from the popliteal vein, then empties that blood into the femoral vein
 - drains blood from the internal jugular vein, then empties that blood into the superior vena cava
 - drains blood from the radial and ulnar veins, then empties that blood into the axillary vein**
 - drains blood from the axillary vein, then empties that blood into the superior vena cava
 - drains blood from the popliteal vein, then empties that blood into the external iliac vein
17. In ABO blood typing, type B blood would:
- clump with anti-A serum
 - clump with anti-B serum**
 - clump with anti-AB serum
 - clump with anti-O serum
 - never clump with antibody serums
18. The ion essential for blood clotting is:
- potassium
 - calcium**
 - sodium
 - iodine
 - hydrogen
19. In men, luteinizing hormone is also called:
- interstitial cell-stimulating hormone**
 - adrenocorticotrophic hormone
 - testosterone
 - androgen
 - follicle-stimulating hormone

20. Which one of the following is NOT true of the lungs:
- a. the right lung has three lobes
 - b. the left lung has two lobes
 - c. the bases rest on the diaphragm
 - d. the narrower portion of each lung is called the apex
 - e. both lungs have two lobes**
21. Lymph node structure includes all of the following EXCEPT:
- a. trabeculae that divide the node into compartments
 - b. Peyer's patches found within the fibrous capsule**
 - c. sinuses
 - d. an outer cortex
 - e. a central medulla
22. Which one of the following is NOT one of the nonspecific body defenses:
- a. the inflammatory response
 - b. natural killer cells
 - c. fever
 - d. antibody production**
 - e. intact skin
23. Which one of the following blood vessels carries oxygenated blood:
- a. superior vena cava
 - b. pulmonary vein**
 - c. coronary sinus
 - d. pulmonary artery
 - e. inferior vena cava
24. Which of the following blood vessels is a direct branch of the ascending aorta:
- a. carotid artery
 - b. both the right and left coronary arteries**
 - c. right coronary artery
 - d. left coronary artery
 - e. right subclavian artery

25. Many home pregnancy tests assay for _____ within a woman's urine.
- a. estrogen
 - b. human chorionic gonadotropin**
 - c. progesterone
 - d. testosterone
 - e. luteinizing hormone
26. The primary function of the small intestine is:
- a. absorption of water
 - b. waste secretion
 - c. absorption of nutrients**
 - d. mineral secretion
 - e. vitamin conversion
27. Intrinsic factor in digestion is a stomach secretion needed for absorption of _____ from the small intestine.
- a. vitamin D
 - b. vitamin B12**
 - c. vitamin K
 - d. vitamin A
 - e. vitamin C
28. Air moving in and out of the lungs is called:
- a. inspiration
 - b. pulmonary ventilation**
 - c. expiration
 - d. internal respiration
 - e. external respiration
29. The respiratory conducting passageways perform all of the following functions EXCEPT:
- a. humidify air
 - b. exchange gases**
 - c. purify air
 - d. warm incoming air
 - e. allow air to reach the lungs

30. Insulin has a(n):
- a. tropic effect
 - b. hypoglycemic effect**
 - c. hyperglycemic effect
 - d. enzymatic effect
 - e. neurologic effect
31. The hypothalamus:
- a. is an important auditory and visual relay center
 - b. is the somatic sensory area
 - c. mediates sensations
 - d. contains reflex centers involved with vision and hearing
 - e. is the thermostat of the body since it regulates body temperature**
32. A compound fracture can be described as when:
- a. the bone is crushed
 - b. the broken bone is exposed to the outside**
 - c. the broken bone ends are forced into each other
 - d. adjacent bones fracture simultaneously
 - e. the bone is broken into many fragments
33. Mucous membranes are located in the:
- a. covering of the brain
 - b. lining of the stomach cavity**
 - c. covering of the heart
 - d. lining of the abdominal cavity wall
 - e. joint cavities
34. Of the capillary beds associated with each nephron, the one that is both fed and drained by arterioles is the:
- a. Bowman's capillaries
 - b. pyramidal capillaries
 - c. peritubular capillaries
 - d. glomerulus**
 - e. Henle capillaries

35. Which one of the following is NOT true of spermatids:
- a. they are nonmotile
 - b. they have no tail
 - c. they have large amounts of cytoplasm
 - d. they have 23 chromosomes
 - e. they are functional sperm**
36. Which one of the following is NOT an organ of the alimentary canal:
- a. pharynx
 - b. stomach
 - c. mouth
 - d. teeth**
 - e. esophagus
37. How does the wall of a vein differ when compared to an artery:
- a. it is lined by a thin layer of endothelium
 - b. it consists of three coats
 - c. it contains smooth muscle
 - d. the middle coat is relatively thin**
 - e. the outer coat is composed largely of collagen fibers
38. The mitral valve is normally closed:
- a. when the ventricle is contracting
 - b. when the ventricle is in systole**
 - c. when the ventricle is in diastole
 - d. by the movement of blood from the atrium to the ventricle
 - e. when the atrium is contracting
39. A neuron with a cell body located in the CNS whose primary function is connecting other neurons is called a(n):
- a. glial cell
 - b. satellite cell
 - c. afferent neuron
 - d. association neuron**
 - e. efferent neuron

40. Which one of the following is the middle section of the small intestine:
- a. ascending colon
 - b. descending colon
 - c. ileum
 - d. duodenum
 - e. jejunum**
41. The umbilical vein carries:
- a. metabolic wastes and carbon dioxide from the fetus to the placenta
 - b. oxygen and nutrients from the placenta to the fetus**
 - c. oxygen and nutrients from the fetus to the placenta
 - d. metabolic wastes and carbon dioxide from the placenta to the fetus
 - e. blood from the navel into the inferior vena cava
42. The point at which an impulse from one nerve cell is communicated to another nerve cell is the:
- a. receptor
 - b. collateral branch
 - c. synapse**
 - d. cell body
 - e. effector
43. The type of tissue that has a matrix that consists of rows of fibroblasts that manufacture collagen fibers is:
- a. dense connective tissue**
 - b. adipose tissue
 - c. osseous tissue
 - d. areolar tissue
 - e. loose connective tissue
44. The nonselective, passive process performed by the glomerulus that forms blood plasma without blood proteins is called:
- a. tubular reabsorption
 - b. secretion
 - c. absorption
 - d. filtration**
 - e. glomerular reabsorption

45. The path of blood flow within the systemic vascular system is:
- arterioles, arteries, venules, veins, capillary beds
 - arteries, arterioles, capillary beds, veins, venules
 - arteries, arterioles, capillary beds, venules, veins**
 - arterioles, arteries, capillary beds, veins, venules
 - arterioles, arteries, capillary beds, venules, veins
46. The posterior side of the leg and foot is served by which nerve:
- peroneal
 - tibial**
 - median
 - femoral
 - obturator
47. The suture that connects the two parietal bones together is the _____ suture, whereas the suture that connects the parietal bones to the occipital bone is the _____ suture.
- sagittal; lambdoid**
 - coronal; sagittal
 - squamosal; lambdoid
 - lambdoid; squamosal
 - sagittal; coronal
48. Vitamin D can be described as:
- taken in via plant products such as wheat germ and green leafy vegetables; may promote wound healing and contribute to fertility (though not proven in humans)
 - produced in the skin from a modified cholesterol molecule on exposure to UV radiation; necessary for normal bone growth and function**
 - derivatives of fatty acids found in cell membranes; various functions include the stimulation of uterine contractions, the regulation of blood pressure, and the control of motility of the gastrointestinal tract
 - made available largely by the action of intestinal bacteria; also prevalent in a wide variety of foods, and necessary for the proper clotting of blood
 - a constituent of orange-pigmented vegetables (carrots) and fruits (tomatoes), and part of the photoreceptor pigment involved in vision
49. The most potent of all mechanisms and substances that the body uses to regulate blood pH are:
- the respiratory system controls
 - the buffer system
 - enzymes
 - hormones
 - the kidneys**

50. Which one of the following is NOT a feature of COPD:

- a. **most patients have a genetic predisposition to COPD**
- b. most COPD victims are hypoxic
- c. most patients have a history of smoking
- d. dyspnea becomes progressively more severe
- e. frequent pulmonary infections are common