Midterm#2 Exam

1. Acetylcholine is neurotransmitter for preganglionic fibers in
    a. Only the sympathetic division of the autonomic nervous system
    b. Only the parasympathetic division of the autonomic nervous system
    c. Both the sympathetic and parasympathetic divisions of the autonomic nervous system
    d. Neither the sympathetic or parasympathetic divisions of the autonomic nervous system

2. Which of the following statements is FALSE?
    a. Under stressful conditions, the sympathetic nervous system dominates over the parasympathetic.
    b. Sympathetic cardiac nerves stimulate heart rate whereas parasympathetic cardiac nerves slow down the heart rate
    c. The sympathetic nervous system has a more widespread effect on the body that does the parasympathetic nervous system
    d. The blood vessels of the skin are one of the few areas of the body were the vessels are innervated by both sympathetic and parasympathetic nervous system.

3. The purpose of positive feedback is to:
    a. Prevent sudden and severe changes in the body
    b. To regulate a process around a set-point
    c. To push a process toward the achievement of a goal
    d. To allow for the maintenance of a steady-state

4. Which of the following is TRUE about erythropoietin?
    a. It is produced in red bone marrow in response to increased blood oxygen levels
    b. It induces production of platelets
    c. It is produced only under conditions of severe blood loss
    d. Its production increases at higher altitudes

5. What happens to the iron (Fe^{3+}) that is released during the breakdown of damaged red blood cells?
    a. It is used to synthesize proteins
    b. It is transported to the liver when it becomes part of bile
    c. It is converted into urobilin and excreted in urine
    d. It attaches to transferrin and is transported to bone marrow for use in hemoglobin synthesis
    e. It is utilized by intestinal bacteria to convert bilirubin into urobilinogen

6. The father is Rh- and the mother is Rh+. They have had one child without a problem due to the Rh factor and now the mother is pregnant again. In terms of Rh factor, the risk to the fetus now within the uterus:

a. Is less than before
b. Is greater than before
c. Never was a problem
d. Is not the same and remains relatively moderate
e. Is nonexistent because the mother was given RhoGAM when delivering the first infant.

7. Which blood type is called the universal donor?

a. A
b. B
c. AB
d. O

8. Together, leukocytes and platelets comprise approximately……. Percent of total blood volume.

a. 1
b. 10
c. 25
d. 45
e. 75

9. A type of anemia in which hemoglobin molecules assume rod shapes that alter shape of RBCs is:

a. Iron-deficiency
b. Sickle cell
c. Hemorrhagic
d. Pernicious

10. Each hemoglobin molecules consists of

a. A single polypeptide chain plus 4 heme groups
b. 4 polypeptide chains plus a single central heme group
c. 4 polypeptide chains, each of which has a central heme group
d. A single polypeptide chain with a central heme group
e. None of the above

11. After erythrocytes have circulated for about 120 days, they are removed by macrophages found chiefly in the:

a. Liver
b. Spleen
c. Appendix
d. Bone marrow
e. heart

12. Which of the following chemicals is an enzyme that converts fibrinogen to fibrin

a. Heparin
b. Thrombin
c. Prothrombin
d. Coagulation factor VI
e. Tissue factor

13. When red blood cells wear out, the iron is saved and the heme portion of the hemoglobin molecule is:

a. Also saved
b. Excreted as bile pigments
c. Rearranged into gamma globulins
d. Broken down by plasmin
e. Used as an anticoagulant

14. How long do erythrocytes normally stay in the circulation?

a. Only a few hours
b. 50 days
c. 120 days
d. One year

15. Sam's blood was determined to be O negative. What does this mean?

a. There are no antibodies to A, to B, or to Rh antigens in his plasma.
b. His red blood cells do not have A or B antigens on their surface
c. His plasma contains antibodies to Rh factor
d. Sam can give blood only to someone with the AB negative blood type.

16. Which sequence correctly represents the order of events?

1)Fibrinogen → Fibrin 2)activation of plasmin 3) formation of prothrombin activator 4)prothrombin → thrombin

a. 3, 4, 1, 2
b. 1, 2, 3, 4
c. 4, 3, 1, 2
d. 3, 2,1, 4

17. Which of the following statements about the end diastolic volume (EDV) is NOT true?
    a. EDV can be decreased by dehydration
    b. EDV can be increased by running
    c. EDV can be increased by sympathetic stimulation
    d. Increase in EDV stretches the heart muscle and increases stroke volume
    e. Increase in EDV increases heart rate

18. Which of the following is true about the autorhythmic cardiac cells?
    a. Their autorhythmicity can be modulated by the autonomic nervous system
    b. Their action potentials have a plateau
    c. Their depolarization is initiated by the influx of calcium via leaky channels
    d. They have stable resting potentials

19. Which of the events below do NOT occur when the aortic semilunar valve is open?
    a. The left ventricle is diastole
    b. Blood is entering the aorta
    c. The bicuspid (mitral valve is closed
    d. Pressure in the left ventricle is higher than in the aorta

20. The P wave of a normal electrocardiogram indicates_____.
    a. Ventricular repolarization
    b. Ventricular depolarization
    c. Atrial repolarization
    d. Atrial depolarization

21. If the length of the absolute refractory period in cardiac muscle cells was the same as it is for skeletal muscle cells _____.
    a. It would be much longer before cardiac cells could respond to a second stimulation
    b. Contractions would last as long as the refractory period
    c. Tetanic contractions might occur, which would stop the heart's pumping action
    d. It would be less than 0. 5 ms.

22. What causes the opening and closing of the heart valves.
    a. Stimulation by the sympathetic and parasympathetic nerves
    b. A pressure difference one the 2 sides of the valve
    c. Na+ and K+ during ventricular depolarization
    d. Turbulent flow in the atria and ventricles
    e. The action of the papillary muscles and chordae tendineae

23. Which of the following statements regarding the cardiac cycle is TRUE?
    a. The AV valves are closed during mid-to-late diastole
    b. The aortic valve is open during isovolumetric contraction
    c. The first heart sound is caused by the closing of the semilunar valves
    d. The dicrotic notch is a result of closure of the aortic valve
    e. Closure of the AV valves occur when the ventricles reach end-systolic volume.

24. The circumflex artery and the anterior interventricular artery are branches of the:
    a. Right coronary artery
    b. Left coronary artery
    c. Marginal artery
    d. Coronary sinus
    e. Aorta

25. The term afterload refers to:
    a. End systolic volume
    b. End diastolic volume
    c. The pressure that must be overcome before the semilunar valves can open
    d. The pressure in the blood vessels necessary to cause the semilunar valves to close
    e. The maximum possible cardiac output above resting cardiac output

26. The left ventricular wall of the heart is thicker than the right ventricular wall in order to:
    a. Accommodate a greater volume of blood
    b. Expand the thoracic cage during diastole
    c. Pump blood with greater pressure
    d. Pump blood through a smaller valve

27. The fossa ovalis is a prominent depression seen in the:
    a. Wall of the aorta
    b. Interventricentricular septum
    c. Coronary sinus
    d. Semilunar valves
    e. Interatrial septum

28. If a patient has a stenosis of the tricuspid valve, there is a reduced rate of blood flow:
    a. From the left ventricle into the aorta
    b. Form the left atrium into the left ventricle
    c. From the inferior vena cava into the right atrium
    d. From the right atrium into the right ventricle
    e. From the right ventricle into the pulmonary artery

29. The Frank Starling Law of the heart states that:
    a. The heart is dependent on the autonomic nervous system in order to contract
    b. The heart contracts to the fullest extent possible or not at all
    c. Cardiac output equals heart rate times stroke volume
    d. The absolute refractory period of cardiac muscle cells must be longer than the duration of contraction of efficient heart functioning
    e. Stroke volume is directly related to venous return

30. Compared to skeletal muscle, cardiac muscle:
    a. Has a gap junctions that allow it to act as a functional syncytium
    b. Lacks striations
    c. Has more nuclei per cell
    d. Cells are larger than skeletal muscle cells

31. Isovolumetric contraction:
    a. Refers to the short period during ventricular systole when the ventricles are completely closed chambers
    b. Occurs while the AV valves are open
    c. Occurs immediately after the semilunar valve close
    d. Occurs only in people with heart valve defects

32. The space between the parietal and visceral layers of the pericardium is normally filled with:
    a. Air
    b. Blood
    c. Adipose tissue
    d. Serous fluid
    e. Serum

33. Normal resting cardiac output for an average adult is approximately:
    a. 70 ml/min
    b. 1 L/min
    c. 2 L/min
    d. 5 L/min
    e. 10 L/min

34. The coronary sinus empties into the:
    a. Right atrium
    b. Left atrium
    c. Right ventricle
    d. Left ventricle

35. The effect of endurance-type athletic training may be to lower the heart rate. This phenomenon:

a. Is a sign of dangerous overexertion
b. Is caused by hypertrophy of the heart muscle
c. Results in decreased cardiac output
d. Does not occur in aerobic training

36. When the cardiac out=15 L/min and the HR = 100 beats/min, the stroke volume equals…..

a. ~70 mL
b. 100 mL
c. 1500 mL
d. 150 mL

37. Which of these correctly states differences between a trained athlete and a sedentary individual at rest?

a. The athlete would have a lower heart rate and a larger stroke volume
b. The athlete would have a higher heart rate and a larger stroke volume
c. The athlete would have a lower heart rate and a smaller stroke volume
d. The athlete would have a higher heart rate and a smaller stroke volume
e. There would be no differences when the individuals were at rest

38. Of the following muscle types, which has only one nucleus, no sarcomeres, and no gap junctions?

a. Unitary smooth muscle
b. Multiunit smooth muscle
c. Cardiac muscle
d. Skeletal muscle

39. The mechanism of contraction in smooth muscle parallels that of skeletal muscle in the following ways:

a. Actin and myosin interact by the sliding filament mechanism
b. The trigger for contraction is a rise in intracellular calum
c. ATP energizes the sliding process
d. All of the above are correct

40. Which of the following statements about smooth muscle is TRUE?

a. Contractions are rapid and forceful
b. Branching fibers are characteristics
c. Nuclei are peripheral located in the fibers
d. Smooth muscle is striated and involuntary
e. Fibers are small and spindle-shaped

41. A single, thick, heavily myelinated axon from spinal cord to skeletal muscle is found in:
    a. Only the sympathetic division of the autonomic nervous system
    b. Only the parasympathetic division of the autonomic nervous system
    c. Both the sympathetic and parasympathetic division of the autonomic nervous system
    d. Neither the sympathetic or parasympathetic divisions of the autonomic nervous system

42. A major difference between neurotransmitters and hormones is that hormones are secreted:
    a. Directly into their target cell
    b. Into the cerebrospinal fluid
    c. Into the extracellular fluid
    d. Into ducts

43. Which of the following is TRUE about hormones?
    a. Steroid hormones are fat soluble and thus easily cross cellular membranes
    b. All hormones are released from the cells producing them via exocytosis
    c. Steroid hormones act via G-proteins and a second messenger system
    d. Protein and peptide hormones directly stimulate gene transcription via binding to DNA associated receptors

44. The integration centre of the autonomic nervous system is the:
    a. Cortex
    b. Hypothalamus
    c. Vagus nerve
    d. Brain stem
    e. None of the above

45. The ability of a specific tissue or organ to respond to the presence of a hormone is dependent on:
    a. The location of that tissue or organ with respect to the circulatory pathway
    b. The membrane potential of the cells of the target organ
    c. The presence of the appropriate receptors on the cells of the target tissue or organ
    d. Nothing→ all hormones of the human body are able to stimulate any all cell types

46. The endocrine control system that directly responds to changing blood levels of ions and nutrients is:
    a. The rapid oxidation of carbohydrates
    b. Catabolic inhibition
    c. Protein synthesis
    d. Humoral stimulation
    e. Hemo-regulatory mechanism

47. The posterior pituitary:
    a. Is the site of release of TSH (thyroid stimulating hormone)
    b. Is composed of neural tissue
    c. Is linked to the hypothalamus via the hypophyseal portal system
    d. Is the site of release of oxytocin
    e. B and D

48. In a feedback system, what are the organs that change the internal environment of the body called?
    a. Hormones
    b. Stimulators
    c. Regulators
    d. Receptors
    e. Effectors

49. The 2 hormones released from the posterior pituitary are synthesized in the:
    a. Anterior pituitary
    b. Posterior pituitary
    c. Hypothalamus
    d. Infundibulum
    e. None of the above

50. A good example of a positive feedback-driven mechanism would be?
    a. Regulation of blood clotting
    b. Body temperature regulation
    c. Regulation of blood sugar levels
    d. Regulation of blood calcium levels