Exam

Name_____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) The smallest living units capable of carrying out their own basic life functions are called 1) _____
A) organelles.
B) organ systems.
C) organs.
D) tissues.
E) cells.

Answer: E

2) Cells are classified into which of the following four broad categories? 2) _____
A) squamous, cubodial, columnar, and basement membranes
B) atoms, tissues, organs, and organ systems
C) skeletal, cardiac, endocrine, and nervous
D) endocrine, nervous, integumentary, and reproductive
E) neurons, muscle, epithelial, and connective tissue

Answer: E

3) Epithelial cells are associated with a noncellular material called a(n) 3) _____
A) endocrine gland.
B) basement membrane.
C) muscle fiber.
D) fibroblast.
E) connective tissue.

Answer: B

4) _____ are found in the linings of hollow organs where they separate fluids in the interior cavity from the surrounding body fluids. The interior cavity of a hollow organ or vessel is known as a _____. 4) _____
A) Elastin cells : cavity
B) Endocrine cells : lumen
C) Epithelial : lumen
D) Connective tissues : basement membrane
E) Smooth muscle cells : cavity

Answer: C

5) The tissue type that generates mechanical force and movement, and whose activity is controlled both on a voluntary and involuntary level, is _____ tissue. 5) _____
A) epithelial
B) muscle
C) connective
D) nervous
E) skeletal

Answer: B

6) Glands are derived from what type of tissue? 6) _____
A) reticular B) connective C) epithelial D) nerve E) muscle

Answer: C

7) The cell types blood, bone, fat, and lymph would be categorized into which of the following major cell classes? 7) _____
A) endocrine cells
B) neurons
C) connective tissue cells
D) epithelial cells
E) muscle cells

Answer: C

8) Which tissue type includes cells contained in an extracellular matrix composed of collagen and elastin? 8) _____
A) connective tissue
B) epithelial tissue
C) muscle tissue
D) endocrine tissue
E) nervous tissue

Answer: A

9) What is a general name for the noncellular material that holds the widely scattered cells of connective tissue together? 9) _____
A) extracellular matrix
B) basement membrane
C) collagen
D) intracellular matrix
E) elastin

Answer: A

10) Which of the following is a protein found in connective tissue that provides the tensile strength to resist stretching? 10) _____
A) basement membrane
B) elastin
C) collagen
D) erythropoietin
E) vimentin

Answer: C

11) What are the structures that attach bone to muscle? 11) _____
A) intracellular matrix proteins
B) ligaments
C) tendons
D) aponeuroses
E) extracellular matrix proteins

Answer: C

12) Organs of the body are defined as 12) _____
A) a collection of tissues that function independently of one another.
B) a collection of cells that perform similar functions.
C) a collection of cells that function independently of one another.
D) two or more tissues combined to form a structure that allows each tissue to function independently.
E) a combination of two or more tissues that make up a structure which performs a specific function.

Answer: E

13) Which of the following accurately represents the order of complexity for the components of the body, from least to most complex? 13) _____
A) cells, tissues, organs, organ systems
B) organ systems, cells, tissues, organs
C) cells, tissues, organ systems, organs
D) organ systems, organs, tissues, cells
E) tissues, cells, organs, organ systems

Answer: A

14) The uptake of nutrients across the epithelial cells of the gastrointestinal tract and into the bloodstream is called 14) _____
A) reabsorption.
B) absorption.
C) excretion.
D) secretion.
E) filtration.

Answer: B

15) What organ system includes the pituitary gland, adrenal gland, and thyroid gland? 15) _____
A) integumentary
B) nervous
C) endocrine
D) cardiovascular
E) immune

Answer: C

16) The lumen of which of the following systems is part of the internal environment? 16) _____
A) gastrointestinal and urinary systems
B) respiratory system
C) gastrointestinal system
D) urinary system
E) cardiovascular system

Answer: E

17) The process whereby fluid from the bloodstream enters the tubules of the kidneys is called 17) _____
A) excretion.
B) reabsorption.
C) secretion.
D) absorption.
E) filtration.

Answer: E

18) The process whereby fluid in the kidneys is transported from the tubules back into the bloodstream is called 18) _____
A) filtration.
B) excretion.
C) reabsorption.
D) secretion.
E) absorption.

Answer: C

19) Referring to a membrane as "selectively permeable" describes its ability to 19) _____
A) provide a barrier that restricts the movement of all molecules across a membrane.
B) allow the movement of particular molecules across a membrane.
C) restrict only the movement of potassium across the membrane.
D) provide a minimal barrier that allows almost any molecule to move across a membrane.
E) restrict only the movement of sodium across a membrane.

Answer: B

20) Extracellular fluid is composed of 20) _____
A) interstitial fluid and plasma.
B) intracellular fluid only.
C) interstitial fluid only.
D) plasma only.
E) plasma and intracellular fluid.

Answer: A

21) Total body water is composed of 21) _____
A) intracellular fluid only.
B) plasma and intracellular fluid.
C) extracellular fluid only.
D) intracellular and interstitial fluid.
E) intracellular and extracellular fluid.

Answer: E

22) Where is most of our total body water located? 22) _____
A) in blood
B) surrounding the cells
C) inside cells
D) in the lumen of the gastrointestinal tract
E) in the lumen of the kidneys

Answer: C

23) Which of the following compartments contain most of the water found in the human body? 23) _____
A) extracellular fluid
B) plasma
C) intracellular fluid
D) lumen of the intestinal tract
E) interstitial fluid

Answer: C

24) What are the two extracellular fluid compartments of the body? 24) _____
A) intracellular fluid and plasma
B) interstitial fluid and plasma
C) intracellular fluid and blood
D) intracellular fluid and interstitial fluid
E) interstitial fluid and blood

Answer: B

25) The portion of body water outside of cells that bathes most cells of the body is called 25) _____
A) interstitial fluid.
B) plasma.
C) intercellular fluid.
D) extracellular fluid.
E) intracellular fluid.

Answer: A

26) The fluid compartment with a high sodium and protein concentration is called 26) _____
A) extracellular fluid.
B) interstitial fluid.
C) intracellular fluid.
D) intracellular and extracellular fluids.
E) plasma.

Answer: E

27) Which of the following best describes intracellular fluid? 27) _____
A) rich in proteins and potassium
B) rich in proteins and chloride
C) rich in sodium and chloride
D) rich in sodium, potassium, and chloride
E) rich in potassium and chloride

Answer: A

28) The fluid compartment with a high sodium concentration that contains only trace amounts of protein is called 28) _____
A) plasma.
B) intracellular and extracellular fluids.
C) extracellular fluid.
D) interstitial fluid.
E) intracellular fluid.

Answer: D

29) For a person weighing 150 pounds, how many liters of water are contained in all of the body's compartments? 29) _____
A) 11 B) 70 C) 50 D) 14 E) 42

Answer: E

30) Homeostasis is a term which describes the process whereby the body 30) _____
A) maintains a variable internal environment.
B) maintains a constant external environment.
C) maintains a constant internal and external environment.
D) affects the external environment.
E) maintains a constant internal environment.

Answer: E

31) Of the following conditions associated with excess heat, which is the most serious condition? 31) _____
A) heat stroke
B) dizziness
C) excessive sweating
D) dehydration
E) heat exhaustion

Answer: A

32) The maintenance of a stable internal environment compatible for life is called 32) _____
A) anatomy.
B) biochemistry.
C) physiology.
D) homeostasis.
E) microbiology.

Answer: D

33) What is the primary mechanism for maintaining homeostasis? 33) _____
A) negative feedback
B) inherent control
C) intrinsic control
D) positive feedback
E) extrinsic control

Answer: A

34) Which of the following statements about homeostasis is FALSE? 34) _____
A) The extracellular fluid is maintained in a state compatible for life.
B) The primary mechanism to maintain homeostasis is positive feedback.
C) Homeostasis is the maintenance of the internal environment.
D) Illness can result if homeostasis is disrupted.
E) The organ systems work together to maintain homeostasis.

Answer: B

35) Changes in the external environment alter the _____, which is detected by the _____, and that information is sent to the integrator. 35) _____
A) error signal : regulated variable
B) sensor : regulated variable
C) regulated variable : set point
D) regulated variable : sensor
E) set point : regulated variable

Answer: D

36) Lisinopril is a medication that lowers high blood pressure back to within a desired range of function. The action of this medication is similar to that of a(n) _____ in the human body. 36) _____

A) integrating center
B) regulated variable
C) set point
D) negative feedback response
E) positive feedback response

Answer: D

37) If you were to take the temperature of everyone in class, assuming no one is sick, you would find that not everyone has a temperature of 98.6°F. Which statement below best explains your findings? 37) _____

A) Most regulated variables, such as temperature, fluctuate continuously and oscillate about the set point due to negative feedback control.
B) The measuring instrument is not working properly; everyone has a set point of 98.6°F.
C) If the subject is not at 98.6°F then he or she is in a disease state
D) Their temperature is no doubt higher than 98.6°F because a positive feedback loop has increased the subjects' metabolism.
E) An error signal has occurred and a positive feedback response has put the persons in question out of the normal range of function.

Answer: A

38) When people cut themselves, they have clotting factors in their blood that will be released continuously in a cascade until their blood clots and terminates the bleeding. What mechanism caused their blood to clot? 38) _____

A) negative feedback control
B) positive feedback control
C) homeostasis
D) reabsorption
E) secretion

Answer: B

39) A _____ detects a change in a regulated variable and sends that information to a(n) _____ which relays signals to a(n) _____, usually a muscle or a gland. 39) _____

A) stimulus : receptor : organ system
B) sensor : integrating center : effector
C) receptor : integrating center : negative feedback control
D) sensor : effector : integrating center
E) receptor : stimulus : regulated variable

Answer: B

40) Vinnie has high blood glucose and must take insulin shots to control his blood sugar. Why must he override his normal homeostatic mechanisms by taking medication? 40) _____

A) Vinnie's negative feedback controls are not functioning properly.
B) An error signal has been sent to Vinnie's integrating center, which is not functioning properly.
C) Vinnie's sensors are detecting high levels of glucose and therefore are not secreting insulin due to positive feedback control.
D) Vinnie's positive feedback controls are not functioning properly.
E) Vinnie's set point has changed telling him he needs more sugar.

Answer: A

41) A patient has a high salt or sodium intake which draws fluid out of his cells to dilute the sodium. This process occurs as a result of 41) _____
A) negative feedback control.
B) excretion.
C) reabsorption.
D) positive feedback control.
E) absorption.

Answer: A

42) The process of maintaining the internal environment in a state compatible for life is called _____, and it occurs primarily through _____. 42) _____
A) homeostasis : negative feedback
B) positive feedback : intrinsic control
C) intrinsic control : negative feedback
D) negative feedback : intrinsic control
E) intrinsic control : homeostasis

Answer: A

43) Which of the following is an example of negative feedback? 43) _____
A) During a blood clot, platelets release ADP, which stimulates platelet aggregation, causing platelets to release more ADP.
B) During an infection, the body temperature set point is increased. The hypothalamus communicates to skeletal muscles to shiver and to blood vessels to decrease blood flow to the skin, causing a rise in body temperature.
C) Consumption of caffeine increases urine output, causing dehydration.
D) At the time of birth, uterine contractions push the baby toward the cervix. Receptors in the cervix detect the pressure caused by the baby and cause the release of a hormone called oxytocin. This hormone stimulates stronger uterine contractions, which push more on the baby, causing an increase in pressure and another increase in oxytocin. The cycle continues until the baby is delivered from the mother.
E) If blood pressure increases above normal, baroreceptors in major arteries detect the change and send signals to the brain. Certain areas of the brain then send signals to the nerves that control the heart and blood vessels to make the heart beat slower and the blood vessels increase in diameter, which in turn reduce the blood pressure.

Answer: E

44) Luteinizing hormone-mediated regulation of estrogen during ovulation in women is an example of 44) _____
A) both a positive and a negative feedback loop.
B) a negative feedback loop.
C) a quasi-negative feedback loop.
D) a quasi-positive feedback loop.
E) a positive feedback loop.

Answer: E

45) The feedback loop involving luteinizing hormone and estrogen is terminated by 45) _____
A) ovulation, which directly inhibits luteinizing hormone secretion.
B) pregnancy.
C) birth.
D) ovulation, which decreases estrogen secretion.
E) nothing; the cycle cannot be terminated.

Answer: D

46) Which of the following is a normal blood glucose level? 46) _____
A) 100 mg/dL
B) 50 mmolar
C) 100 gm/mL
D) 200 mmolar
E) 50 mg/dL

Answer: A

47) What is the difference between diabetes mellitus and diabetes insipidus? 47) _____
A) One causes diarrhea; the other causes diuresis.
B) One is a deficit in insulin activity; the other a deficit in ADH activity.
C) One is a lack of insulin secretion; the other a resistance to insulin.
D) One is a lack of ADH secretion; the other a resistance to ADH.
E) One causes increased fluid loss; the other causes increased thirst.

Answer: B

48) What cells secrete insulin? 48) _____
A) beta cells of the pancreas
B) alpha cells of the pancreas
C) G cells of the adrenal cortex
D) several cells located throughout the body
E) I cells of the adrenal cortex

Answer: A

49) Approximately what percentage of people living in the United States suffers from diabetes mellitus? 49) _____
A) 1% B) 0.5% C) 15% D) 8% E) 0.1%

Answer: D

50) Which of the following people would be more prone to develop diabetes mellitus type II? 50) _____
A) an obese Hispanic child
B) an obese white adult
C) an obese Hispanic adult
D) a thin, malnourished, African American child
E) a thin white adult

Answer: C

51) What percentage of adults in the United States is obese? 51) _____
A) 15% B) 20% C) 25% D) 10% E) 35%

Answer: E

52) Which of the following types of diabetes mellitus was formerly referred to as insulin-dependent or juvenile-onset diabetes mellitus? 52) _____
A) type 1
B) diabetes insipidus
C) type 2
D) prediabetes
E) gestational diabetes

Answer: A

53) What are the two major consequences for those who suffer from diabetes mellitus? 53) _____
A) low blood sugar and fainting
B) high blood glucose and glucose in the urine
C) high blood glucose and cells that cannot utilize that glucose for energy
D) high blood glucose and excessive urination
E) high blood glucose and excessive thirst

Answer: C

54) Although diabetes mellitus has many symptoms, the primary diagnostic symptoms of the disease are _____ and _____. 54) _____
A) elevated blood glucose : glucose in the urine
B) elevated blood glucose : lethargy
C) elevated blood glucose : poor healing
D) lethargy : dizziness
E) dizziness : dehydration

Answer: A

55) What lab test, often deemed the "lie detector test" by health care workers, measures the average blood glucose levels for the past 2-3 months? 55) _____
A) glucose tolerance test
B) hemoglobin A_{1c} test
C) random blood glucose test
D) siphon test
E) fasting blood glucose test

Answer: B

56) Obesity is identified using what measurement? 56) _____
A) ethnicity scale
B) CDC disease scale
C) body mass index (BMI)
D) waist circumference scale
E) body type index

Answer: C

57) What percentage of women will develop type 2 diabetes after developing gestational diabetes? 57) _____
A) 25-30% B) 3-4% C) 12-15% D) 5-10% E) 1-2%

Answer: D

58) What is the primary reason the prevalence of diabetes is increasing in the U.S. population? 58) _____
A) obesity
B) lack of physical activity
C) an aging population
D) sedentary lifestyles
E) the U.S. diet

Answer: C

59) Prediabetics have a fasting blood glucose level of _____ and, according to the Centers for Disease Control (CDC), approximately _____ million Americans are prediabetic. 59) _____

A) 500-1000 mg/dL : 300
B) 70-100 mg/dL : 10
C) 100-125 mg/dL : 80
D) 200-250 mg/dL : 50
E) 300-400 mg/dL : 100

Answer: C

60) John has type 2 diabetes. He has a sedentary lifestyle, is overweight, and recently went to the doctor who gave him a hemoglobin A_{1c} test which came back at 7%. What is the best course of treatment for John? 60) _____

A) insulin shots and a healthy diet
B) a strict diet, frequent monitoring of his blood glucose, exercise, and oral glucose medication
C) insulin shots and exercise
D) measure his BMI, continued monitoring of his blood glucose levels with a hemoglobin A_{1c} test, and changes in lifestyle
E) frequent monitoring of his blood glucose levels with insulin shots

Answer: B

61) Which tissue below is specialized for lining the lumen of vessels material? 61) _____

A) epithelial tissue
B) connective tissue
C) nervous tissue
D) muscle tissue
E) reticular tissue

Answer: A

62) Which tissue below conducts signals primarily via electrical impulses? 62) _____

A) epithelial tissue
B) connective tissue
C) nervous tissue
D) muscle tissue
E) reticular tissue

Answer: C

63) Which tissue below provides structural support? 63) _____

A) epithelial tissue
B) connective tissue
C) nervous tissue
D) muscle tissue
E) reticular tissue

Answer: B

64) Which tissue below contracts to generate force? 64) _____

A) epithelial tissue
B) connective tissue
C) nervous tissue
D) muscle tissue
E) reticular tissue

Answer: D

65) The elimination of unabsorbed materials from the body refers to which of the processes below? 65) _____
A) reabsorption
B) excretion
C) secretion
D) absorption
E) filtration

Answer: B

66) Movement from the lumen of the gastrointestinal tract to the blood would represent which of the following processes? 66) _____
A) absorption
B) filtration
C) excretion
D) reabsorption
E) secretion

Answer: A

67) Movement from the blood into the kidney tubules would represent which of the following processes? 67) _____
A) secretion
B) absorption
C) excretion
D) reabsorption
E) filtration

Answer: E

68) Which of the following is/are associated with the endocrine system? 68) _____
A) pancreas
B) esophagus
C) adrenal gland
D) blood vessels
E) bronchi

Answer: C

69) Which of the following is/are associated with the nervous system? 69) _____
A) bronchi
B) esophagus
C) adrenal cortex
D) blood vessels
E) brain

Answer: E

70) Which of the following is/are a component of the cardiovascular system? 70) _____
A) bronchi
B) esophagus
C) adrenal gland
D) brain
E) blood vessels

Answer: E

71) Which of the following is/are associated with the respiratory system? 71) _____
A) adrenal gland
B) esophagus
C) bronchi
D) brain
E) blood vessels
Answer: C

72) Which of the following is/are associated with the gastrointestinal system? 72) _____
A) blood vessels
B) brain
C) adrenal gland
D) esophagus
E) bronchi
Answer: D

73) The smallest living units, capable of carrying out their own basic life processes, are 73) _____
A) tissues. B) molecules. C) atoms. D) cells. E) organs.
Answer: D

74) Cells that carry oxygen in the bloodstream are called 74) _____
A) leukocytes.
B) erythrocytes.
C) lymphocytes.
D) karyocytes.
E) hemoglobin.
Answer: B

75) What tissue is specialized for separating fluids? 75) _____
A) epithelial B) connective C) nervous D) muscle E) endocrine
Answer: A

76) What tissue is a major component of bone, ligaments, and blood? 76) _____
A) epithelial B) connective C) nervous D) muscle E) endocrine
Answer: B

77) What tissue is specialized for generating electrical signals? 77) _____
A) epithelial B) connective C) nervous D) muscle E) endocrine
Answer: C

78) What tissue is specialized to contract? 78) _____
A) epithelial B) connective C) nervous D) muscle E) endocrine
Answer: D

79) The specific structures that attach bone to bone are called 79) _____
A) smooth muscle.
B) sheathing.
C) ligaments.
D) tendons.
E) skeletal muscle.

Answer: C

80) The _____ is the interior compartment of a hollow organ or vessel. 80) _____
A) lumen
B) intracellular matrix
C) epithelium
D) cavity
E) basement membrane

Answer: A

81) The process whereby enzymes are moved into the gastrointestinal tract to digest nutrients is called 81) _____
A) absorption.
B) filtration.
C) reabsorption.
D) secretion.
E) excretion.

Answer: D

82) The process whereby fluid and ions that have not been reabsorbed by the kidneys exit the body as urine is called 82) _____
A) filtration.
B) excretion.
C) secretion.
D) reabsorption.
E) absorption.

Answer: B

83) The fluid (non-cellular) portion of blood is called 83) _____
A) the internal environment.
B) interstitial fluid.
C) plasma.
D) intracellular matrix.
E) intracellular fluid.

Answer: C

84) The fluid compartment with a high protein and potassium concentration is called 84) _____
A) the internal environment.
B) extracellular fluid.
C) total body water.
D) intracellular fluid.
E) interstitial fluid.

Answer: D

85) Where is most of the water in the body found? 85) _____

A) in the extracellular fluid
B) in the interstitial fluid
C) in the plasma
D) in the intracellular fluid
E) in the lumen of the stomach

Answer: D

86) Insulin is a hormone that regulates blood glucose levels. It is released when glucose levels increase above normal. Based on the concept of negative feedback, what effect will insulin have on blood glucose levels? 86) _____

A) It will decrease them.
B) Insulin will not affect glucose levels.
C) It will increase them.
D) It makes them go both up and down.
E) Insulin does not regulate blood glucose levels.

Answer: A

87) What cells secrete insulin? 87) _____

A) exocrine cells
B) alpha cells
C) beta cells
D) collagen cells
E) neurons

Answer: C

88) Body mass index is a measure of weight in kilograms relative to 88) _____

A) gender.
B) height in meters (squared).
C) arm length.
D) weight (in kilograms in water).
E) waste circumference.

Answer: B

89) Pre-diabetics have fasting blood glucose levels of 89) _____

A) 100-125 mg/dL
B) 70-100 mg/dL
C) 90-100 mg/dL
D) 150-200 mg/dL
E) 200-210 mg/dL

Answer: A

90) What type of ductless gland secretes hormones into the bloodstream? 90) _____

A) salivary B) endocrine C) matrix D) sweat E) exocrine

Answer: B

91) Which statement below best defines homeostasis? 91) _____

A) Homeostasis is the process whereby the body changes with the external environment.
B) Homeostasis is the process whereby the body maintains the internal environment in a state compatible for life.
C) Homeostasis is maintained through positive feedback loops.
D) Homeostasis refers to the regulation of temperature in the human body.
E) Homeostasis means all regulated variables are at the set point.

Answer: B

92) Which statement below lists the essential components of a feedback loop and describes their function? 92) _____

A) Sensor detects a regulated variable; set point is the value of the regulated variable; integrator interprets the information and sends it to the appropriate effector; effector alters the regulated variable.
B) Sensor detects a regulated variable; integrator interprets the information and sends it to the appropriate effector; effector alters the regulated variable; organ system returns the body back to normal
C) Integrator interprets the information; set point is the value of the regulated variable; effector alters the regulated variable.
D) Set point detects the regulated variable; integrator interprets the information and sends it to the appropriate effector; effector decides if it will react or not to the signal.
E) Set point is the value of the regulated variable; integrator interprets the information and sends it to the appropriate effector; effector alters the regulated variable; set point is the point the variable must always return to.

Answer: A

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

93) Physiology is the study of function and can come in many forms, including plant physiology. 93) _____

Answer: True False

94) Pathophysiology is what happens when normal body functions are disrupted. 94) _____

Answer: True False

95) Connective tissue forms both endocrine and exocrine glands. 95) _____

Answer: True False

96) Exocrine glands secrete hormones. 96) _____

Answer: True False

97) The immune system protects the body from invading microorganisms. 97) _____

Answer: True False

98) Most of the cells of the body are able to directly exchange materials with the external environment. 98) _____

Answer: True False

99) The internal and external environments are separated by the selectively permeable membranes of epithelial cells. 99) _____

Answer: True False

100) The most abundant substance in the body is carbon. 100) _____

Answer: True False

101) Intracellular fluid and extracellular fluid are of the same ion composition. 101) _____

Answer: True False

102) The homeostatic mechanisms of the body are unlimited in their ability to respond to changes in the external environment. 102) _____

Answer: True False

103) Blood glucose is a regulated variable. 103) _____

Answer: True False

104) Effectors bring about a final response in a negative feedback loop. 104) _____

Answer: True False

105) Positive feedback loops are impossible to stop once they have begun. 105) _____

Answer: True False

106) All forms of diabetes involve a decrease in plasma levels of insulin. 106) _____

Answer: True False

107) Diabetes mellitus requires insulin injections for maintenance. 107) _____

Answer: True False

108) Once a woman develops gestational diabetes, she will have diabetes for life. 108) _____

Answer: True False

109) People with a body mass index (BMI) less than 25 are most prone to develop type 2 diabetes mellitus. 109) _____

Answer: True False

110) Cases of diabetes mellitus are increasing throughout the world, not just in the United States. 110) _____

Answer: True False

111) Obesity predisposes a person to develop type 1 diabetes mellitus. 111) _____

Answer: True False

112) Diabetes mellitus causes hyperglycemia. 112) _____

Answer: True False

ESSAY. Write your answer in the space provided or on a separate sheet of paper.

113) Describe the four general groups of cells (tissues) that are found in the body, outlining the important characteristics of each group and their functions.

Answer: Nervous tissue - Neurons are specialized for the transmission of information in the form of electrical signals. They typically possess a number of branches that function to receive or transmit those electrical signals. Some are even capable of detecting sensory information.
Muscle tissue - Muscle cells are involved in force development and movement. They tend to be elongated in shape and can be under either voluntary or involuntary control.
Epithelial tissue - Epithelial cells are arranged as a sheet-like layer of cells connected to a thin, non-cellular basement membrane. These cells are found in many shapes, sizes, and layer thicknesses. They are closely associated with their neighbors, providing a barrier separating body fluids from the external environment. Certain epithelial cells are specialized to transport specific molecules from one compartment to another.
Connective tissue - This tissue encompasses many cell types including blood cells, bone cells, and many others. In a narrow sense, these cells provide physical support for other structures like tendons and ligaments. In a broader sense, the term connective tissue encompasses fluids like blood and lymph that "connect" parts of the body by providing an avenue for communication.

114) Water is the most abundant molecule in the human body. Identify both the amount of water and its location within the body.

Answer: TBW represents the total volume of fluid within the body and is approximately 42 liters for an ideal human subject of 150 pounds. Most of the water in the body (28 liters) is found in intracellular fluid or the fluid found inside of cells. Extracellular fluid (14 liters of TBW), the fluid outside of cells, is composed of two compartments. One is the fluid component of blood (plasma), which is approximately 3 liters. The second is the fluid that bathes cells (interstitial fluid), which makes up 11 liters of TBW.

115) Blood glucose is a regulated variable controlled by a negative feedback loop. Explain what is meant by the term negative feedback and discuss how this mechanism would work in the case of high blood glucose.

Answer: Negative feedback systems reverse the response of an increasing variable back to the set point for that variable. In this case, the rising blood glucose levels are detected by the sensors or beta cells within the pancreas. The beta cells also act as the integrating center and release the hormone insulin into the blood stream. Insulin causes glucose to move from the plasma of the blood into the cells of the body or effectors therefore driving down the levels of glucose back to within normal ranges.

116) Compare and contrast the different forms of diabetes.

Answer: There are several types of diabetes, including diabetes mellitus type 1, diabetes mellitus type 2, diabetes insipidus, and gestational diabetes. Diabetes mellitus types 1 and 2 are associated with insufficient actions of insulin causing hyperglycemia and a number of other symptoms.
Diabetes mellitus type 1 is caused by decreased secretion of insulin. Without sufficient insulin, cells do not uptake glucose to meet their metabolic needs. Liver and muscle cells do not uptake insulin to store energy for later needs. Thus hyperglycemia and fatigue are common symptoms.
In diabetes mellitus type 2, beta cells of the pancreas secrete insulin, but effector cells do not respond to the insulin. Thus symptoms are similar to that of diabetes mellitus type 1.
Diabetes insipidus is a disease affecting the release of antidiuretic hormone (ADH). ADH promotes water reabsorption from the kidneys, and in its absence (or a decrease in tissue responsiveness to it), excessive water is lost in the urine causing dehydration.
Gestational diabetes develops in some pregnant women. It is similar to type 2 diabetes mellitus, with hormones of pregnancy thought to induce the insulin resistance. Gestational diabetes often reverses following delivery of the baby.