

Name _____

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

- 1) What tissue is a major component of bone, ligaments, and blood? 1) _____
A) epithelial B) connective C) nervous D) muscle E) endocrine

Answer: B

Explanation: A)
B)
C)
D)
E)

- 2) A patient has a high salt or sodium intake which draws fluid out of his cells to dilute the sodium. 2) _____
This process occurs as a result of

- A) negative feedback control.
B) reabsorption.
C) excretion.
D) positive feedback control.
E) absorption.

Answer: A

Explanation: A)
B)
C)
D)
E)

- 3) Which of the following is/are associated with the endocrine system? 3) _____

- A) esophagus
B) bronchi
C) adrenal gland
D) blood vessels
E) pancreas

Answer: C

Explanation: A)
B)
C)
D)
E)

- 4) What tissue is specialized for generating electrical signals? 4) _____

- A) epithelial B) connective C) nervous D) muscle E) endocrine

Answer: C

Explanation: A)
B)
C)
D)
E)

5) Which tissue below contracts to generate force?

5) _____

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

Answer: D

Explanation: A)
B)
C)
D)
E)

6) Epithelial cells are associated with a noncellular material called a(n)

6) _____

- A) basement membrane.
- B) muscle fiber.
- C) endocrine gland.
- D) connective tissue.
- E) fibroblast.

Answer: A

Explanation: A)
B)
C)
D)
E)

7) What percentage of adults in the United States is obese?

7) _____

- A) 10%
- B) 15%
- C) 35%
- D) 20%
- E) 25%

Answer: C

Explanation: A)
B)
C)
D)
E)

8) What are the structures that attach bone to muscle?

8) _____

- A) aponeuroses
- B) intracellular matrix proteins
- C) ligaments
- D) tendons
- E) extracellular matrix proteins

Answer: D

Explanation: A)
B)
C)
D)
E)

9) Where is most of our total body water located?

9) _____

- A) in the lumen of the gastrointestinal tract
- B) in blood
- C) inside cells
- D) in the lumen of the kidneys
- E) surrounding the cells

Answer: C

Explanation: A)
B)
C)
D)
E)

10) Which tissue below conducts signals primarily via electrical impulses?

10) _____

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

Answer: C

Explanation: A)
B)
C)
D)
E)

11) Luteinizing hormone-mediated regulation of estrogen during ovulation in women is an example of 11) _____

- A) a negative feedback loop.
- B) both a positive and a negative feedback loop.
- C) a quasi-negative feedback loop.
- D) a quasi-positive feedback loop.
- E) a positive feedback loop.

Answer: E

Explanation: A)
B)
C)
D)
E)

12) Total body water is composed of

12) _____

- A) extracellular fluid only.
- B) intracellular fluid only.
- C) intracellular and interstitial fluid.
- D) plasma and intracellular fluid.
- E) intracellular and extracellular fluid.

Answer: E

Explanation: A)
B)
C)
D)
E)

13) The _____ is the interior compartment of a hollow organ or vessel.

13) _____

- A) epithelium
- B) intracellular matrix
- C) basement membrane
- D) cavity
- E) lumen

Answer: E

Explanation: A)
B)
C)
D)
E)

14) 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.

14) _____

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

Answer: C

Explanation: A)
B)
C)
D)
E)

15) Which of the following is an example of negative feedback?

15) _____

- A) Consumption of caffeine increases urine output, causing dehydration.
- 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) 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.
- D) 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.
- E) During a blood clot, platelets release ADP, which stimulates platelet aggregation, causing platelets to release more ADP.

Answer: D

Explanation: A)
B)
C)
D)
E)

16) The process whereby fluid in the kidneys is transported from the tubules back into the bloodstream is called 16) _____

- A) filtration.
- B) reabsorption.
- C) secretion.
- D) absorption.
- E) excretion.

Answer: B

Explanation: A)
B)
C)
D)
E)

17) Homeostasis is a term which describes the process whereby the body 17) _____

- A) affects the external environment.
- B) maintains a constant internal and external environment.
- C) maintains a variable internal environment.
- D) maintains a constant external environment.
- E) maintains a constant internal environment.

Answer: E

Explanation: A)
B)
C)
D)
E)

18) What tissue is specialized to contract? 18) _____

- A) epithelial B) connective C) nervous D) muscle E) endocrine

Answer: D

Explanation: A)
B)
C)
D)
E)

19) What is the difference between diabetes mellitus and diabetes insipidus? 19) _____

- A) One causes diarrhea; the other causes diuresis.
- B) One is a lack of ADH secretion; the other a resistance to ADH.
- C) One is a lack of insulin secretion; the other a resistance to insulin.
- D) One causes increased fluid loss; the other causes increased thirst.
- E) One is a deficit in insulin activity; the other a deficit in ADH activity.

Answer: E

Explanation: A)
B)
C)
D)
E)

- 20) The process whereby fluid and ions that have not been reabsorbed by the kidneys exit the body as urine is called 20) _____
- A) absorption.
 - B) excretion.
 - C) reabsorption.
 - D) secretion.
 - E) filtration.
- Answer: B
- Explanation: A)
B)
C)
D)
E)
- 21) The fluid compartment with a high sodium concentration that contains only trace amounts of protein is called 21) _____
- A) intracellular fluid.
 - B) extracellular fluid.
 - C) intracellular and extracellular fluids.
 - D) interstitial fluid.
 - E) plasma.
- Answer: D
- Explanation: A)
B)
C)
D)
E)
- 22) Which of the following is/are associated with the gastrointestinal system? 22) _____
- A) blood vessels
 - B) esophagus
 - C) bronchi
 - D) adrenal gland
 - E) brain
- Answer: B
- Explanation: A)
B)
C)
D)
E)

23) What is the primary mechanism for maintaining homeostasis?

23) _____

- A) intrinsic control
- B) extrinsic control
- C) inherent control
- D) negative feedback
- E) positive feedback

Answer: D

Explanation: A)
B)
C)
D)
E)

24) What is the primary reason the prevalence of diabetes is increasing in the U.S. population?

24) _____

- A) lack of physical activity
- B) the U.S. diet
- C) an aging population
- D) obesity
- E) sedentary lifestyles

Answer: C

Explanation: A)
B)
C)
D)
E)

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

25) _____

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

Answer: C

Explanation: A)
B)
C)
D)
E)

26) _____ 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 _____.

- A) Epithelial : lumen
- B) Smooth muscle cells : cavity
- C) Connective tissues : basement membrane
- D) Endocrine cells : lumen
- E) Elastin cells : cavity

Answer: A

Explanation: A)
B)
C)
D)
E)

27) The lumen of which of the following systems is part of the internal environment? 27) _____

- A) cardiovascular system
- B) urinary system
- C) gastrointestinal system
- D) gastrointestinal and urinary systems
- E) respiratory system

Answer: A

Explanation: A)
B)
C)
D)
E)

28) The fluid compartment with a high protein and potassium concentration is called 28) _____

- A) interstitial fluid.
- B) intracellular fluid.
- C) extracellular fluid.
- D) the internal environment.
- E) total body water.

Answer: B

Explanation: A)
B)
C)
D)
E)

29) Which statement below lists the essential components of a feedback loop and describes their function? 29) _____

- A) 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
- B) 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.
- C) 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.
- D) 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.
- E) Integrator interprets the information; set point is the value of the regulated variable; effector alters the regulated variable.

Answer: D

Explanation: A)
B)
C)
D)
E)

30) What type of ductless gland secretes hormones into the bloodstream? 30) _____

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

Answer: E

Explanation: A)
B)
C)
D)
E)

31) The process whereby enzymes are moved into the gastrointestinal tract to digest nutrients is called 31) _____

- A) filtration.
- B) excretion.
- C) reabsorption.
- D) absorption.
- E) secretion.

Answer: E

Explanation: A)
B)
C)
D)
E)

32) The tissue type that generates mechanical force and movement, and whose activity is controlled both on a voluntary and involuntary level, is _____ tissue. 32) _____

- A) connective
- B) epithelial
- C) skeletal
- D) nervous
- E) muscle

Answer: E

Explanation: A)
B)
C)
D)
E)

33) The smallest living units capable of carrying out their own basic life functions are called 33) _____

- A) cells.
- B) organ systems.
- C) tissues.
- D) organelles.
- E) organs.

Answer: A

Explanation: A)
B)
C)
D)
E)

34) Movement from the lumen of the gastrointestinal tract to the blood would represent which of the following processes? 34) _____

- A) reabsorption
- B) filtration
- C) secretion
- D) excretion
- E) absorption

Answer: E

Explanation: A)
B)
C)
D)
E)

- 35) Which of the following statements about homeostasis is FALSE? 35) _____
- A) Homeostasis is the maintenance of the internal environment.
 - B) The primary mechanism to maintain homeostasis is positive feedback.
 - C) The organ systems work together to maintain homeostasis.
 - D) The extracellular fluid is maintained in a state compatible for life.
 - E) Illness can result if homeostasis is disrupted.
- Answer: B
- Explanation: A)
B)
C)
D)
E)
- 36) What cells secrete insulin? 36) _____
- A) exocrine cells
 - B) beta cells
 - C) collagen cells
 - D) neurons
 - E) alpha cells
- Answer: B
- Explanation: A)
B)
C)
D)
E)
- 37) What are the two extracellular fluid compartments of the body? 37) _____
- A) intracellular fluid and plasma
 - B) interstitial fluid and blood
 - C) intracellular fluid and interstitial fluid
 - D) interstitial fluid and plasma
 - E) intracellular fluid and blood
- Answer: D
- Explanation: A)
B)
C)
D)
E)
- 38) The maintenance of a stable internal environment compatible for life is called 38) _____
- A) homeostasis.
 - B) biochemistry.
 - C) microbiology.
 - D) physiology.
 - E) anatomy.
- Answer: A
- Explanation: A)
B)
C)
D)
E)

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

Answer: A

Explanation: A)
B)
C)
D)
E)

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

Answer: E

Explanation: A)
B)
C)
D)
E)

- 41) Pre-diabetics have fasting blood glucose levels of _____
A) 150-200 mg/dL
B) 200-210 mg/dL
C) 70-100 mg/dL
D) 100-125 mg/dL
E) 90-100 mg/dL

Answer: D

Explanation: A)
B)
C)
D)
E)

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

Answer: C

Explanation: A)
B)
C)
D)
E)

- 43) Which of the following compartments contain most of the water found in the human body? 43) _____
A) extracellular fluid
B) lumen of the intestinal tract
C) intracellular fluid
D) interstitial fluid
E) plasma
Answer: C
Explanation: A)
B)
C)
D)
E)
- 44) Cells are classified into which of the following four broad categories? 44) _____
A) atoms, tissues, organs, and organ systems
B) endocrine, nervous, integumentary, and reproductive
C) squamous, cuboidal, columnar, and basement membranes
D) skeletal, cardiac, endocrine, and nervous
E) neurons, muscle, epithelial, and connective tissue
Answer: E
Explanation: A)
B)
C)
D)
E)
- 45) The elimination of unabsorbed materials from the body refers to which of the processes below? 45) _____
A) excretion
B) reabsorption
C) secretion
D) filtration
E) absorption
Answer: A
Explanation: A)
B)
C)
D)
E)
- 46) What tissue is specialized for separating fluids? 46) _____
A) epithelial B) connective C) nervous D) muscle E) endocrine
Answer: A
Explanation: A)
B)
C)
D)
E)

47) Where is most of the water in the body found?

47) _____

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

Answer: B

Explanation: A)
B)
C)
D)
E)

48) Approximately what percentage of people living in the United States suffers from diabetes mellitus?

48) _____

- A) 1%
- B) 0.1%
- C) 15%
- D) 0.5%
- E) 8%

Answer: E

Explanation: A)
B)
C)
D)
E)

49) The portion of body water outside of cells that bathes most cells of the body is called

49) _____

- A) interstitial fluid.
- B) intracellular fluid.
- C) plasma.
- D) extracellular fluid.
- E) intercellular fluid.

Answer: A

Explanation: A)
B)
C)
D)
E)

50) 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.

50) _____

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

Answer: E

Explanation: A)
B)
C)
D)
E)

- 51) The cell types blood, bone, fat, and lymph would be categorized into which of the following major cell classes? 51) _____
- A) epithelial cells
 - B) connective tissue cells
 - C) endocrine cells
 - D) neurons
 - E) muscle cells
- Answer: B
- Explanation: A)
B)
C)
D)
E)
- 52) Which of the following types of diabetes mellitus was formerly referred to as insulin-dependent or juvenile-onset diabetes mellitus? 52) _____
- A) diabetes insipidus
 - B) prediabetes
 - C) type 1
 - D) gestational diabetes
 - E) type 2
- Answer: C
- Explanation: A)
B)
C)
D)
E)
- 53) 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? 53) _____
- A) negative feedback control
 - B) secretion
 - C) positive feedback control
 - D) homeostasis
 - E) reabsorption
- Answer: C
- Explanation: A)
B)
C)
D)
E)

54) The uptake of nutrients across the epithelial cells of the gastrointestinal tract and into the bloodstream is called

54) _____

- A) filtration.
- B) excretion.
- C) reabsorption.
- D) absorption.
- E) secretion.

Answer: D

Explanation: A)
B)
C)
D)
E)

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) random blood glucose test
- B) fasting blood glucose test
- C) hemoglobin A_{1c} test
- D) siphon test
- E) glucose tolerance test

Answer: C

Explanation: A)
B)
C)
D)
E)

56) What are the two major consequences for those who suffer from diabetes mellitus?

56) _____

- A) high blood glucose and excessive urination
- B) low blood sugar and fainting
- C) high blood glucose and excessive thirst
- D) high blood glucose and glucose in the urine
- E) high blood glucose and cells that cannot utilize that glucose for energy

Answer: E

Explanation: A)
B)
C)
D)
E)

57) Which of the following people would be more prone to develop diabetes mellitus type II? 57) _____

- A) an obese white adult
- B) a thin, malnourished, African American child
- C) an obese Hispanic child
- D) an obese Hispanic adult
- E) a thin white adult

Answer: D

Explanation: A)
B)
C)
D)
E)

58) Of the following conditions associated with excess heat, which is the most serious condition? 58) _____

- A) heat exhaustion
- B) dizziness
- C) dehydration
- D) excessive sweating
- E) heat stroke

Answer: E

Explanation: A)
B)
C)
D)
E)

59) 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? 59) _____

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

Answer: A

Explanation: A)
B)
C)
D)
E)

60) Which of the following is a protein found in connective tissue that provides the tensile strength to resist stretching? 60) _____

- A) vimentin
- B) collagen
- C) basement membrane
- D) erythropoietin
- E) elastin

Answer: B

Explanation: A)
B)
C)
D)
E)

61) Which statement below best defines homeostasis? 61) _____

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

Answer: E

Explanation: A)
B)
C)
D)
E)

62) The process of maintaining the internal environment in a state compatible for life is called _____, and it occurs primarily through _____. 62) _____

- A) negative feedback : intrinsic control
- B) intrinsic control : negative feedback
- C) intrinsic control : homeostasis
- D) homeostasis : negative feedback
- E) positive feedback : intrinsic control

Answer: D

Explanation: A)
B)
C)
D)
E)

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

Explanation: A)
B)
C)
D)
E)

64) The smallest living units, capable of carrying out their own basic life processes, are

64) _____

- A) tissues.
- B) cells.
- C) organs.
- D) atoms.
- E) molecules.

Answer: B

Explanation: A)
B)
C)
D)
E)

65) Organs of the body are defined as

65) _____

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

Answer: E

Explanation: A)
B)
C)
D)
E)

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

66) _____

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

Answer: A

Explanation: A)
B)
C)
D)
E)

67) The process whereby fluid from the bloodstream enters the tubules of the kidneys is called

67) _____

- A) secretion.
- B) reabsorption.
- C) excretion.
- D) filtration.
- E) absorption.

Answer: D

Explanation: A)
B)
C)
D)
E)

68) For a person weighing 150 pounds, how many liters of water are contained in all of the body's compartments?

68) _____

- A) 11
- B) 70
- C) 50
- D) 42
- E) 14

Answer: D

Explanation: A)
B)
C)
D)
E)

69) Cells that carry oxygen in the bloodstream are called

69) _____

- A) erythrocytes.
- B) karyocytes.
- C) hemoglobin.
- D) lymphocytes.
- E) leukocytes.

Answer: A

Explanation: A)
B)
C)
D)
E)

70) Movement from the blood into the kidney tubules would represent which of the following processes?

70) _____

- A) reabsorption
- B) absorption
- C) filtration
- D) excretion
- E) secretion

Answer: C

Explanation: A)
B)
C)
D)
E)

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

71) _____

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

Answer: C

Explanation: A)
 B)
 C)
 D)
 E)

72) Obesity is identified using what measurement?

72) _____

- A) waist circumference scale
- B) body type index
- C) ethnicity scale
- D) CDC disease scale
- E) body mass index (BMI)

Answer: E

Explanation: A)
 B)
 C)
 D)
 E)

73) Extracellular fluid is composed of

73) _____

- A) interstitial fluid and plasma.
- B) plasma and intracellular fluid.
- C) plasma only.
- D) intracellular fluid only.
- E) interstitial fluid only.

Answer: A

Explanation: A)
 B)
 C)
 D)
 E)

- 74) 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?
- A) insulin shots and exercise
 - B) insulin shots and a healthy diet
 - C) frequent monitoring of his blood glucose levels with insulin shots
 - D) measure his BMI, continued monitoring of his blood glucose levels with a hemoglobin A_{1c} test, and changes in lifestyle
 - E) a strict diet, frequent monitoring of his blood glucose, exercise, and oral glucose medication

74) _____

Answer: E

Explanation: A)
B)
C)
D)
E)

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

75) _____

Answer: A

Explanation: A)
B)
C)
D)
E)

- 76) 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?
- A) Vinnie's set point has changed telling him he needs more sugar.
 - B) Vinnie's sensors are detecting high levels of glucose and therefore are not secreting insulin due to positive feedback control.
 - C) Vinnie's negative feedback controls are not functioning properly.
 - D) An error signal has been sent to Vinnie's integrating center, which is not functioning properly.
 - E) Vinnie's positive feedback controls are not functioning properly.

76) _____

Answer: C

Explanation: A)
B)
C)
D)
E)

77) Which of the following accurately represents the order of complexity for the components of the body, from least to most complex?

77) _____

- A) organ systems, organs, tissues, cells
- B) cells, tissues, organs, organ systems
- C) organ systems, cells, tissues, organs
- D) cells, tissues, organ systems, organs
- E) tissues, cells, organs, organ systems

Answer: B

Explanation: A)
 B)
 C)
 D)
 E)

78) Which tissue type includes cells contained in an extracellular matrix composed of collagen and elastin?

78) _____

- A) endocrine tissue
- B) connective tissue
- C) nervous tissue
- D) muscle tissue
- E) epithelial tissue

Answer: B

Explanation: A)
 B)
 C)
 D)
 E)

79) What organ system includes the pituitary gland, adrenal gland, and thyroid gland?

79) _____

- A) endocrine
- B) nervous
- C) immune
- D) cardiovascular
- E) integumentary

Answer: A

Explanation: A)
 B)
 C)
 D)
 E)

80) Which of the following best describes intracellular fluid?

80) _____

- A) rich in sodium and chloride
- B) rich in sodium, potassium, and chloride
- C) rich in proteins and chloride
- D) rich in proteins and potassium
- E) rich in potassium and chloride

Answer: D

Explanation: A)
B)
C)
D)
E)

81) The specific structures that attach bone to bone are called

81) _____

- A) tendons.
- B) skeletal muscle.
- C) smooth muscle.
- D) sheathing.
- E) ligaments.

Answer: E

Explanation: A)
B)
C)
D)
E)

82) Although diabetes mellitus has many symptoms, the primary diagnostic symptoms of the disease are _____ and _____.

82) _____

- A) dizziness : dehydration
- B) elevated blood glucose : lethargy
- C) elevated blood glucose : poor healing
- D) elevated blood glucose : glucose in the urine
- E) lethargy : dizziness

Answer: D

Explanation: A)
B)
C)
D)
E)

83) Which of the following is a normal blood glucose level?

83) _____

- A) 100 mg/dL
- B) 100 gm/mL
- C) 50 mmolar
- D) 50 mg/dL
- E) 200 mmolar

Answer: A

Explanation: A)
B)
C)
D)
E)

84) Which of the following is/are associated with the nervous system?

84) _____

- A) esophagus
- B) brain
- C) adrenal cortex
- D) blood vessels
- E) bronchi

Answer: B

Explanation: A)
B)
C)
D)
E)

85) What percentage of women will develop type 2 diabetes after developing gestational diabetes?

85) _____

- A) 5-10%
- B) 25-30%
- C) 1-2%
- D) 3-4%
- E) 12-15%

Answer: A

Explanation: A)
B)
C)
D)
E)

86) Which of the following is/are a component of the cardiovascular system?

86) _____

- A) brain
- B) adrenal gland
- C) bronchi
- D) esophagus
- E) blood vessels

Answer: E

Explanation: A)
B)
C)
D)
E)

87) What cells secrete insulin?

87) _____

- A) G cells of the adrenal cortex
- B) beta cells of the pancreas
- C) several cells located throughout the body
- D) alpha cells of the pancreas
- E) I cells of the adrenal cortex

Answer: B

Explanation: A)
B)
C)
D)
E)

88) What is a general name for the noncellular material that holds the widely scattered cells of connective tissue together?

88) _____

- A) basement membrane
- B) extracellular matrix
- C) collagen
- D) elastin
- E) intracellular matrix

Answer: B

Explanation: A)
B)
C)
D)
E)

89) 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?

89) _____

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

Answer: B

Explanation: A)
B)
C)
D)
E)

90) The feedback loop involving luteinizing hormone and estrogen is terminated by

90) _____

- A) ovulation, which directly inhibits luteinizing hormone secretion.
- B) pregnancy.
- C) birth.
- D) nothing; the cycle cannot be terminated.
- E) ovulation, which decreases estrogen secretion.

Answer: E

Explanation: A)
B)
C)
D)
E)

91) The fluid (non-cellular) portion of blood is called

91) _____

- A) the internal environment.
- B) interstitial fluid.
- C) plasma.
- D) intracellular matrix.
- E) intracellular fluid.

Answer: C

Explanation: A)
B)
C)
D)
E)

92) Which of the following is/are associated with the respiratory system?

92) _____

- A) blood vessels
- B) brain
- C) esophagus
- D) adrenal gland
- E) bronchi

Answer: E

Explanation: A)
B)
C)
D)
E)

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

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

93) _____

Answer: True ☒ False

Explanation:

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

94) _____

Answer: True ☒ False

Explanation:

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

95) _____

Answer: True ☒ False

Explanation:

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

96) _____

Answer: True ☒ False

Explanation:

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

97) _____

Answer: True ☒ False

Explanation:

- 98) The most abundant substance in the body is carbon. 98) _____
Answer: True ☒ False
Explanation:
- 99) The immune system protects the body from invading microorganisms. 99) _____
Answer: ☒ True False
Explanation:
- 100) All forms of diabetes involve a decrease in plasma levels of insulin. 100) _____
Answer: True ☒ False
Explanation:
- 101) Effectors bring about a final response in a negative feedback loop. 101) _____
Answer: ☒ True False
Explanation:
- 102) Pathophysiology is what happens when normal body functions are disrupted. 102) _____
Answer: ☒ True False
Explanation:
- 103) Cases of diabetes mellitus are increasing throughout the world, not just in the United States. 103) _____
Answer: ☒ True False
Explanation:
- 104) Connective tissue forms both endocrine and exocrine glands. 104) _____
Answer: True ☒ False
Explanation:
- 105) Intracellular fluid and extracellular fluid are of the same ion composition. 105) _____
Answer: True ☒ False
Explanation:
- 106) Physiology is the study of function and can come in many forms, including plant physiology. 106) _____
Answer: ☒ True False
Explanation:
- 107) The internal and external environments are separated by the selectively permeable membranes of epithelial cells. 107) _____
Answer: ☒ True False
Explanation:
- 108) Positive feedback loops are impossible to stop once they have begun. 108) _____
Answer: True ☒ False
Explanation:
- 109) Exocrine glands secrete hormones. 109) _____
Answer: True ☒ False
Explanation:

110) Diabetes mellitus causes hyperglycemia.

110) _____

Answer: ☒ True ☐ False

Explanation:

111) Blood glucose is a regulated variable.

111) _____

Answer: ☒ True ☐ False

Explanation:

112) Diabetes mellitus requires insulin injections for maintenance.

112) _____

Answer: ☐ True ☒ False

Explanation:

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) 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.

115) 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.

116) 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.

Answer Key
Testname: C1

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

Answer Key
Testname: C1

- 51) B
- 52) C
- 53) C
- 54) D
- 55) C
- 56) E
- 57) D
- 58) E
- 59) A
- 60) B
- 61) E
- 62) D
- 63) B
- 64) B
- 65) E
- 66) A
- 67) D
- 68) D
- 69) A
- 70) C
- 71) C
- 72) E
- 73) A
- 74) E
- 75) A
- 76) C
- 77) B
- 78) B
- 79) A
- 80) D
- 81) E
- 82) D
- 83) A
- 84) B
- 85) A
- 86) E
- 87) B
- 88) B
- 89) B
- 90) E
- 91) C
- 92) E
- 93) FALSE
- 94) FALSE
- 95) FALSE
- 96) FALSE
- 97) FALSE
- 98) FALSE
- 99) TRUE
- 100) FALSE

Answer Key
Testname: C1

- 101) TRUE
- 102) TRUE
- 103) TRUE
- 104) FALSE
- 105) FALSE
- 106) TRUE
- 107) TRUE
- 108) FALSE
- 109) FALSE
- 110) TRUE
- 111) TRUE
- 112) FALSE

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