

Exam

Name _____

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

- 1) What is the term for the pseudoscience that attempted to discover a universal cure for disease and a magic elixir for immortality? 1) _____
 - A) biochemistry
 - B) alchemy
 - C) inorganic chemistry
 - D) organic chemistry
 - E) none of the above

- 2) What is the term for the study of chemical substances derived from plants and animals? 2) _____
 - A) green chemistry
 - B) organic chemistry
 - C) biochemistry
 - D) inorganic chemistry
 - E) none of the above

- 3) What is the term for the study of the composition and properties of matter? 3) _____
 - A) alchemy
 - B) chemistry
 - C) science
 - D) biochemistry
 - E) none of the above

- 4) What is the term for the procedure of collecting data and recording observations under controlled conditions? 4) _____
 - A) experiment
 - B) chemistry
 - C) alchemy
 - D) science
 - E) none of the above

- 5) What is the term for the design of products and processes that reduce or eliminate hazardous chemical substances? 5) _____
 - A) inorganic chemistry
 - B) green chemistry
 - C) biochemistry
 - D) organic chemistry
 - E) none of the above

- 6) What is the term for a tentative proposal of a scientific principle that attempts to explain the meaning of a set of data collected in an experiment? 6) _____
- A) theory
 - B) estimation
 - C) natural law
 - D) hypothesis
 - E) none of the above
- 7) What is the term for the study of chemical substances that do NOT contain the element carbon? 7) _____
- A) organic chemistry
 - B) green chemistry
 - C) inorganic chemistry
 - D) biochemistry
 - E) none of the above
- 8) What is the term for an extensively tested proposal of a scientific principle that states a measurable relationship at different conditions? 8) _____
- A) experiment
 - B) hypothesis
 - C) theory
 - D) natural law
 - E) none of the above
- 9) What is the term for the study of chemical substances that contain the element carbon? 9) _____
- A) inorganic chemistry
 - B) biochemistry
 - C) organic chemistry
 - D) green chemistry
 - E) none of the above
- 10) What is the term for the methodical exploration of nature and the logical explanation of the observations? 10) _____
- A) alchemy
 - B) chemistry
 - C) science
 - D) experiment
 - E) none of the above

- 11) What is the term for an investigation that entails performing an experiment, proposing a hypothesis, testing the hypothesis, and stating a theory or law? 11) _____
- A) alchemy
 - B) chemistry
 - C) scientific method
 - D) science
 - E) none of the above
- 12) What is the term for an extensively tested proposal of a scientific principle that explains the behavior of nature? 12) _____
- A) natural law
 - B) hypothesis
 - C) scientific theory
 - D) experiment
 - E) none of the above
- 13) What two forces were responsible for bringing the natural world into existence according to the beliefs of the ancient Chinese? 13) _____
- A) yin and yang
 - B) positive and negative
 - C) shiva and vishnu
 - D) male and female
 - E) none of the above
- 14) What four elements composed everything in nature according to the beliefs of the ancient Greeks? 14) _____
- A) air, ashes, fire, and water
 - B) air, earth, fire, and water
 - C) smoke, earth, fire, and water
 - D) air, earth, salt, and water
 - E) none of the above
- 15) Which of the following was a basic element in nature according to Aristotle? 15) _____
- A) salt
 - B) smoke
 - C) ashes
 - D) ether
 - E) none of the above
- 16) Who is generally considered the founder of the scientific method? 16) _____
- A) Robert Boyle
 - B) Aristotle
 - C) John Dalton
 - D) Antoine Lavoisier
 - E) none of the above

- 17) What book led to the scientific method by arguing that theories are no better than the experiments on which they are based? 17) _____
- A) *Methods of Chemical Research*
 - B) *Elementary Treatise on Chemistry*
 - C) *Scientific Investigations of Gases*
 - D) *The Sceptical Chymist*
 - E) none of the above
- 18) Which of the following is a basic step in the scientific method? 18) _____
- A) test a hypothesis and state a theory or law
 - B) perform an experiment and collect data
 - C) analyze experimental data and propose a hypothesis
 - D) all of the above
 - E) none of the above
- 19) What is the difference between a hypothesis and a scientific theory? 19) _____
- A) A theory requires an experiment and a hypothesis does not.
 - B) A theory is a tentative proposal and a hypothesis is a tested proposal.
 - C) A hypothesis requires an experiment and a theory does not.
 - D) A hypothesis is a tentative proposal and a theory is a tested proposal.
 - E) none of the above
- 20) What is the difference between a scientific theory and a natural law? 20) _____
- A) A theory is a tentative proposal and a law is a tested proposal.
 - B) A law is a tentative proposal and a theory is a tested proposal.
 - C) A law explains behavior and a theory states a measurable relationship.
 - D) A theory explains behavior and a law states a measurable relationship.
 - E) none of the above
- 21) What question can we ask in order to distinguish between a theory and a law? 21) _____
- A) Does the statement concern gases?
 - B) Does the statement concern atoms?
 - C) Is the statement comprehensible?
 - D) Is the statement measurable?
 - E) none of the above
- 22) Which of the following statements is a scientific theory? 22) _____
- A) The energy of two gas molecules is the same before and after a collision.
 - B) Atoms contain protons, neutrons, and electrons.
 - C) Equal volumes of gases contain the same number of molecules.
 - D) all of the above
 - E) none of the above

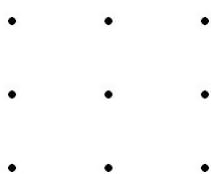
- 23) Which of the following statements is a natural law? 23) _____
- A) If the volume of a gas doubles, the pressure decreases by a factor of two.
 - B) The mass of substances, before and after a chemical change, is the same.
 - C) The energy derived from a change in mass is found by $E = mc^2$.
 - D) all of the above
 - E) none of the above
- 24) Who is generally considered the founder of modern chemistry? 24) _____
- A) Robert Boyle
 - B) Antoine Lavoisier
 - C) John Dalton
 - D) Aristotle
 - E) none of the above
- 25) Which of the following is a branch of chemistry? 25) _____
- A) organic chemistry
 - B) inorganic chemistry
 - C) biochemistry
 - D) all of the above
 - E) none of the above
- 26) Which of the following is a branch of chemistry? 26) _____
- A) physical chemistry
 - B) analytical chemistry
 - C) environmental chemistry
 - D) all of the above
 - E) none of the above
- 27) In which of the following industries does chemistry play an important role? 27) _____
- A) agriculture
 - B) pharmaceutical
 - C) medicine
 - D) petrochemical
 - E) all of the above
- 28) In which of the following industries does chemistry play an important role? 28) _____
- A) paper
 - B) electronics
 - C) construction
 - D) transportation
 - E) all of the above

- 29) Petrochemicals are derived from which of the following of resources? 29) _____
A) trees
B) petroleum
C) seawater
D) atmosphere
E) none of the above
- 30) Which of the following is derived from a petrochemical? 30) _____
A) pesticides
B) fuels
C) paints
D) all of the above
E) none of the above
- 31) Which of the following is derived from a petrochemical? 31) _____
A) plastics
B) dyes
C) detergents
D) textiles
E) all of the above
- 32) Which of the following professions requires a knowledge of chemistry? 32) _____
A) nurse
B) sports trainer
C) dentist
D) pharmacist
E) all of the above
- 33) In a survey by the *American Chemical Society*, how did entering college students rate chemistry in their daily lives? 33) _____
A) rarely relevant
B) somewhat relevant
C) moderately relevant
D) highly relevant
E) irrelevant
- 34) In a survey by the *American Chemical Society*, what percentage of entering college students thought that chemistry is a difficult subject? 34) _____
A) 100% B) 83% C) 10% D) 1% E) 5%

35) Is it possible to observe one visual image and have two different perceptions? 35) _____
A) It is only possible if the image is in black and white.
B) no
C) yes
D) It is only possible if the image is in color.
E) It is only possible if the image is large.

36) Why would a student at first find a problem impossible to solve when later the solution is obvious? 36) _____
A) The student did not have chemistry.
B) The student did not have biology.
C) The student did not have physics.
D) The student had an unconscious assumption.
E) none of the above

37) What is the unconscious assumption that prevents connecting the following nine dots with four straight, continuous lines? 37) _____



- A) A line cannot be drawn at a 45° angle.
- B) A line cannot be longer than 1 inch.
- C) A line cannot be drawn at a 90° angle.
- D) A line cannot be drawn past a dot.
- E) none of the above

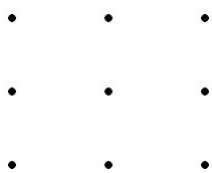
38) Which of the following is a positive association with the study of chemistry? 38) _____
A) Chemistry offers career opportunities.
B) Chemistry is relevant to our daily lives.
C) Chemistry benefits society.
D) Chemistry has biomedical applications.
E) all of the above

39) Which of the following is a positive association with the practice of chemistry? 39) _____
A) Chemistry experiments may be fun.
B) Chemistry experiments may be foul smelling.
C) Chemistry experiments may cause injury.
D) Chemistry experiments may produce toxic waste.
E) none of the above

40) What subject is referred to as the central science? 40) _____
A) geology
B) chemistry
C) biology
D) physics
E) none of the above

41) What subject is said to be at the crossroads of biology, physics, and geology? 41) _____
A) chemistry
B) biochemistry
C) environmental chemistry
D) geochemistry
E) none of the above

42) What is the minimum number of straight, continuous lines that are necessary to connect the following nine dots? 42) _____



A) 1 B) 2 C) 3 D) 4 E) 5

43) Who was the Greek founder of medicine and recommended soaking patients in salt water to cure various ailments? 43) _____
A) Aristotle
B) Hippocrates
C) Archimedes
D) Plato
E) none of the above

44) What are the natural sources of ordinary table salt? 44) _____
A) evaporation of salt water
B) salt mining
C) solution mining
D) all of the above
E) none of the above

- 45) What is the recommended daily allowance (RDA) for sodium? 45) _____
A) ~ 1 teaspoon of salt
B) ~ 1 crystal of salt
C) ~ 1 tablespoon of salt
D) ~ 1 cup of salt
E) none of the above
- 46) What is the recommended daily allowance (RDA) for sodium? 46) _____
A) ~ 2300 mg
B) ~ 23 mg
C) ~ 230 mg
D) ~ 2300 g
E) none of the above
- 47) Table salt contains which of the following for proper thyroid metabolism? 47) _____
A) potassium oxide
B) potassium iodide
C) potassium bromide
D) potassium chloride
E) none of the above
- 48) Which common inexpensive metal was more valuable than gold in the nineteenth century? 48) _____
A) aluminum
B) silver
C) copper
D) zinc
E) nickel
- 49) Although aluminum metal is not found free in nature, it is very common in which of the following minerals? 49) _____
A) bauxite B) quartz C) cinnabar D) galena E) halite
- 50) Who was the American chemistry student that discovered an inexpensive method for producing aluminum metal from its ore? 50) _____
A) Thomas Edison
B) Charles Martin Hall
C) Alexander Graham Bell
D) Linus Pauling
E) Charles Goodyear

51) Who was the French chemist that discovered an inexpensive method for producing aluminum metal from its ore? 51) _____

- A) André Michelin
- B) Frederick Alum
- C) Paul Héroult
- D) Joseph Gay-Lussac
- E) Jacques Charles

52) What is the approximate price of aluminum metal in today's market? 52) _____

- A) ~ \$10 per pound
- B) ~ 1¢ per pound
- C) ~ 10¢ per pound
- D) ~ \$100 per pound
- E) ~ \$1 per pound

Answer Key

Testname: UNTITLED1

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

Answer Key

Testname: UNTITLED1

43) B

44) D

45) A

46) A

47) B

48) A

49) A

50) B

51) C

52) E