

This practice test is the same length as the lecture exam, and the questions are about the same level of difficulty. I wrote them all, so the style is similar too. You may find it useful to study the review questions at the end of the text chapters. Most test questions come from lecture, but you are responsible for both text and lecture material. Good luck!

1. Approximately how many different journals (technical periodicals) comprise the primary literature of biology?
 - a. 900
 - b. 9,000
 - c. 90,000
 - d. all of the above
 - e. none of the above
2. Our textbook is an example of:
 - a. primary scientific literature
 - b. secondary scientific literature
 - c. tertiary scientific literature
3. Objective information:
 - a. is the same for everyone.
 - b. depends upon faith alone.
 - c. is the only kind of knowledge.
 - d. depends upon opinion.
4. In the following example of the hypothetico-deductive method, which item is the hypothesis?
 - a. What is the shape is the earth?
 - b. The shape of the earth may be round.
 - c. If so, can reach east by sailing west.
 - d. Columbus' voyage.
 - e. none of the above.
5. Galileo's conflict with the Catholic Church occurred because he did not:
 - a. believe in God.
 - b. go to Church regularly.
 - c. accept that Scripture was divinely inspired.
 - d. accept the prevailing interpretation of Scripture.
6. Which of the following exhibits all seven characteristics of a living organism?
 - a. a crystal of salt
 - b. the HIV virus
 - c. dehydrated eggs of "sea monkeys"
 - d. all of the above
 - e. none of the above
7. An organism that obtains its energy and materials from organic molecules is called a(n):
 - a. autotroph.
 - b. heterotroph.
 - c. chemotroph.
 - d. cryptobiot.
8. Homeostasis refers to a constancy which is the result of:
 - a. no input or output.
 - b. imbalance of input and output.
 - c. controlled balance of input and output.
 - d. a dynamic equilibrium.
 - e. c and d.
9. Which properties are shared by both crystals and living organisms?
 - a. Homeostasis and energy use.
 - b. Growth and reproduction.
 - c. Responsiveness and evolution.
 - d. Random shapes.
 - e. None of the above.
10. Relative to those close to the nucleus, electrons occupying orbitals at greater distances from the nucleus possess:
 - a. higher energy.
 - b. lower energy.
 - c. the same energy
11. Which element is more electronegative, sodium (Na) or chlorine (Cl)? (Hint: a compound that contains both elements is NaCl).
 - a. Na is more electronegative.
 - b. Cl is more electronegative.
 - c. They do not differ.

12. Which statement is false?
- Elements are distinguished by their atomic number.
 - Isotopes are distinguished by their mass.
 - Two isotopes of an element have the same atomic number.
 - Isotopes of an element differ in their chemical properties.
13. ^{14}C spontaneously turns into N at a constant rate, with a half-life of 5,600 years. After 11,200 years, what proportion of the original ^{14}C will be left?
- 1.0
 - 0.5
 - 0.25
 - 0.1
 - 0
14. A mole of ethanol and a mole of hemoglobin (or any other molecule) will have an equal:
- weight in daltons
 - mass in grams
 - number of atoms
 - number of molecules
 - volume
15. Chemical reactions involve the making or breaking of bonds between:
- protons.
 - atoms.
 - electrons.
 - cells.
16. The element nitrogen has 7 protons in its nucleus. Using only this information, how many hydrogen atoms would you predict nitrogen to bind covalently?
- one
 - two
 - three
 - five
 - twelve
17. The covalent bonds between H and O in a water molecule are polar because:
- O and H are equally electronegative.
 - O is more electronegative than H.
 - H is more electronegative than O.
 - water molecules are cohesive.
 - hydrogen bonds form between H and O.
18. The weak electrostatic attraction between hydrogen covalently bound to an electronegative atom and another electronegative nucleus is called a:
- double covalent bond.
 - electronegative bond.
 - electrostatic bond.
 - hydrogen bond.
19. Which statement is true for cations?
- There are equal numbers of protons and electrons.
 - There are more protons than electrons.
 - There are more electrons than protons.
20. The energy required to heat ethanol is 0.6 cal/g $^{\circ}\text{C}$. Is this energy greater or less than that needed to heat water?
- greater than
 - less than
 - the same as
21. In "pure" water:
- pH is acidic.
 - pH is basic
 - pH is neutral.
 - no H^+ or OH^- are present.
22. Which kind of bonds are most easily broken in water?
- ionic
 - peptide
 - disulphide
 - single covalent
 - double covalent

23. Which is not a property of water?

- a. good solvent for electrolytes
- b. high specific heat
- c. adheres to polar compounds
- d. contracts during freezing

24. If the pH of a solution goes from 8 to 7, this means that the hydrogen ion concentration has:

- a. decreased by 1 mole/liter.
- b. increased by 1 mole/liter.
- c. decreased 10 fold.
- d. increased 10 fold.
- e. both a and c.

25. A molecule which releases hydrogen ion when added to a solution (thus raising the hydrogen ion concentration of the solution and lowering the pH) is called:

- a. a base
- b. an acid
- c. an antacid
- d. a pH
- e. a buffer

26. The meaning of the symbol Σ is:

- a. sum the set that follows.
- b. multiply by the mean.
- c. square root of the variance.
- d. amphipathic.
- e. Greek to me.

27. Statistics that describe a sample are called:

- a. descriptive statistics.
- b. inferential statistics.
- c. obfuscations.

28. A statistic that measures the scatter of a sample around the mean is the:

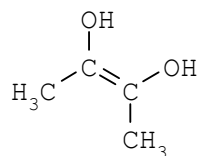
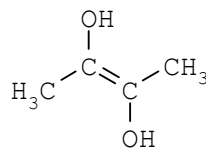
- a. confidence interval.
- b. average.
- c. standard deviation.
- d. population.
- e. none of the above

29. Which property is similar between carbon (${}^6\text{C}$) and silicon (${}^{14}\text{Si}$)?

- a. atomic number
- b. ambivalence
- c. specific heat
- d. atomic mass
- e. valence

30. Consider the two molecules below. Which label describes them accurately?

- a. Two isotopes
- b. Two structural isomers
- c. Two geometric isomers
- d. Two stereoisomers



31. Which of these functional groups is usually ionized at physiological pH?

- a. hydrogen.
- b. hydroxyl.
- c. carbonyl.
- d. carboxyl.
- e. all of the above.

32. Which functional group is found in both aldehydes and ketones?

- a. hydroxyl
- b. carbonyl
- c. carboxyl
- d. amino
- e. phosphate

33. Which is a monosaccharide?

- a. sucrose.

- b. maltose.
c. glucose.
d. starch.
e. cellulose.
34. The molecular mass of glucose is 180 grams. This means that:
- a. one gram of glucose contains 180 moles.
b. one mole of glucose weighs 180 grams.
c. one molecule of glucose weighs 180 grams.
d. each molecule of glucose contains 180 protons.
e. none of the above.
35. Which is the most abundant organic molecule?
- a. collagen
b. water
c. starch
d. cellulose
e. keratin
36. Which of the following is an important functional group in fatty acids?
- a. hydroxyl
b. phosphate
c. carboxyl
d. sulphide
e. carbonyl
37. Soap facilitates the mixing of oil and water, allowing us to remove grease from our skin, because the molecules of soap are:
- a. amphipathic.
b. hydrophobic.
c. hydrophilic.
d. polymeric
e. none of the above.
38. The compounds used by both animals and plants for lipid storage are called:
- a. polysaccharides.
b. triglycerides.
c. surfactants.
d. polypeptides.
- e. proteins.
39. The most abundant protein in the human body is:
- a. cellulose
b. keratin
c. hemoglobin
d. glycogen
e. collagen
40. Soaking fish in lemon juice or vegetables in vinegar is similar to cooking because it disrupts the:
- a. primary structure of the proteins.
b. peptide bonds of the proteins.
c. tertiary structure of the proteins.
d. all of the above.
41. Which best describes the alpha helix structure of proteins? It results from:
- a. covalent bonds between C and C
b. ionic bonds between N and H
c. covalent bonds between N and O
d. hydrogen bonds between H and O
e. hydrogen bonds between N and O
42. The difference between a peptide and a protein is the:
- a. degree of saturation
b. arrangement of the double bonds
c. position of the asymmetric carbon
d. number of amino acid residues
e. presence of carbonyl
43. Proteins are not:
- a. polymers of amino acids.
b. the genetic program.
c. important catalysts.
d. the expression of the genetic program.
e. good to eat.
44. The presence of disulfide bonds in proteins can contribute to the:
- a. primary structure

- b. secondary structure
- c. tertiary structure
- d. quaternary structure
- e. both c and d.

45. Heat is the most:

- a. organized form of potential energy.
- b. disorganized form of potential energy.
- c. organized form of kinetic energy.
- d. disorganized form of kinetic energy.

46. The heat necessary to raise the temperature of a kilogram of water by 1 degree Celcius is called a:

- a. kilocalorie.
- b. mole.
- c. kilometer.
- d. kilomole.

47. A concentration gradient and a chemical reaction that is not at equilibrium both possess:

- a. kinetic energy.
- b. potential energy.
- c. heat energy.
- d. entropy.

48. When diffusion occurs, so that molecules are arranged more randomly in a solution, which of the following would increase?

- a. heat
- b. gravity
- c. entropy
- d. magnetism
- e. potential energy

49. Free energy is defined as:

- a. heat.
- b. entropy.
- c. kinetic energy of molecules.
- d. energy which does not cost anything.
- e. energy which is available to do work.

50. The presence of a catalyst affects a chemical reaction by:

- a. increasing reaction rate.
- b. slowing reaction rate.
- c. changing the equilibrium of the reaction.

Answer Key: Remember- these questions won't do you any good if you don't understand why the answer is correct. Try to answer them from your notes or text before going to the key to check your work.

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