

Biology 111**In-class Exam #1****Feb 4, 2011**

For each question or statement select the best answer or completion. Mark your selections on a scantron form using a pencil.

1. Science is concerned with:
 - a) anything that can be measured
 - b) issues of morality
 - c) the meaning of life
 - d) the existence of God
 - e) the meaning of art

2. The assumption of natural causality implies for scientists that, for example ...
 - a) monarch butterflies navigate by divinely inspired intuition
 - b) though rare, miracles happen
 - c) your astrological sign says quite a lot about your character
 - d) all of the above
 - e) none of the above

3. The winter habitat of the monarch butterflies of eastern North America is ...
 - a) at high elevation in southern Mexico.
 - b) all along the gulf coast.
 - c) a desert region of eastern Cuba
 - d) in the Costa Rican rain forest
 - e) the hills of southern Appalachia

4. An example(s) of discovery science would be
 - a) finding that the eastern spotted salamander actually also occurs in the west.
 - b) locating a new galaxy close to our own.
 - c) injecting mice with a bacteria to see if it causes disease.
 - d) both a and b
 - e) a, b, and c.

5. An example(s) of hypothetical science would be...
 - a) finding that the eastern spotted salamander actually also occurs in the west.
 - b) locating a new galaxy close to our own.
 - c) injecting mice with a bacteria to see if it causes disease.
 - d) both a and d
 - e) a, b, and c.

6. You come home to find your front door broken and open. This would best be described as a(n)...
 - a) theory
 - b) conclusion
 - c) control
 - d) hypothesis
 - e) observation

7. You come home to find your front door broken and open. Your first thought is, "I've been robbed!" Your suspicion could best be described as a(n)...
 - a) theory
 - b) conclusion
 - c) control
 - d) hypothesis
 - e) observation

8. In science, an experimental test intended to rule out a competing explanation is called a(n)...
 - a) theory
 - b) conclusion
 - c) control
 - d) hypothesis
 - e) observation

9. In order, the steps of the scientific method are ...
 - a) observation, experimentation, hypothesis, conclusion
 - b) experimentation, observation, , conclusion, hypothesis
 - c) observation, hypothesis, experimentation, conclusion
 - d) experimentation, observation, conclusion, hypothesis
 - e) experimentation, observation, hypothesis, conclusion

10. The 2005 Nobel Prize in medicine went to two Australians (Barry Marshall and Robin Warren) who discovered...
a) *Helicobacter pylori* b) early human fossils c) a cure for arthritis
d) a cure for cancer c) none of these
11. The two Australians did the work for which they received their award in...
a) eastern Europe b) a Harvard laboratory c) arctic Russia d) early 2003 e) the 1980s
12. The three most abundant elements in the human body are...
a) P, O, C b) H, K, P c) N, O, H d) O, C, H e) Ca, He, Ne
13. How many protons does an atom of carbon have?
a) 2 b) 4 c) 6 d) 8 e) 10
14. How many electrons does an atom of oxygen have?
a) 2 b) 4 c) 6 d) 8 e) 10
15. Which isotope of Carbon is most abundant in nature?
a) ^{12}C b) ^{13}C c) ^{14}C d) ^{15}C e) they are all about the same.
16. The half-life of ^{14}C is...
a) 10.6 minutes b) 36.4 days c) 12.9 weeks d) 29.1 months d) 5,730 years
17. The maximum electron capacity of successive atomic electron shells, beginning at the innermost, is...
a) 8,8,8,2 b) 2,4,2,4 c) 2,4,6,8, d) 8,8,8,8 e) 2,8,8,8
18. A charged atom, one that has given up or gained an electron, is called a(n)...
a) isotope b) ion c) proton d) neutron e) gluon
19. How many covalent bonds does Carbon form?
a) 1 b) 2 c) 3 d) 4 e) None
20. How many covalent bonds does Oxygen form?
a) 1 b) 2 c) 3 d) 4 e) None
21. An example(s) of non-polar covalent bond(s) include ...
a) O-H b) C-C c) C-H d) Na-Cl e) b and c
22. An example(s) of polar covalent bond(s) include ...
a) O-H b) C-C c) C-H d) Na-Cl e) b and c
23. Water molecules have a slight (but important) tendency to dissociate. This dissociation produces...
a) $\text{H}^+ + \text{H}^+$ b) $\text{H}^+ + \text{OH}^-$ c) $\text{OH}^- + \text{OH}^-$ d) $\text{H}_2\text{O} + \text{H}_2\text{O}$ e) $\text{H}_2\text{O} + \text{H}^+$
24. Molecules that don't dissolve easily in water are said to be...
a) amphiphilic b) hydrophobic c) hydrophilic d) agoraphobic c) pathetic
25. Molecules that do dissolve easily in water are said to be...
a) amphiphilic b) hydrophobic c) hydrophilic d) agoraphobic c) pathetic
26. Some molecules contain one end or part that is quite water soluble while the other end is not water soluble. The

term for such molecules is...

- a) amphiphilic b) hydrophobic c) hydrophilic d) agoraphobic e) pathetic

27. A molecule that contains both Carbon and Hydrogen and perhaps other atoms is ...
a) carbonaceous b) a hydrocarbon c) nutritious d) organic e) post-modern
28. _____ refers to a common functional group of biological molecules consisting of a Nitrogen atom bonded to two Hydrogen atoms.
a) amino b) carboxyl c) hydroxyl d) phosphate e) a and d
29. Which of the following functional groups is(are) acidic?
a) amino b) carboxyl c) hydroxyl d) phosphate e) b and d
30. _____ is the term that refers to the type of reaction that disassembles large biological molecules in which a water molecule is consumed.
a) defamation b) relaxation c) dehydration d) hydrolysis e) condensation
31. What class of biological molecule is composed of C, H, and O in a ratio of 1:2:1?
a) lipids b) proteins c) hydrocarbons d) nucleic acids e) carbohydrates
32. Which of the following is not a carbohydrate?
a) amylose b) sucrose c) cellulose d) glucose e) linoleic acid
33. An example of a polysaccharide is...
a) amylose b) cellulose c) glucose d) sucrose e) both a and b
34. An example of a disaccharide is...
a) amylose b) cellulose c) glucose d) sucrose e) both a and b
35. Lipids are defined as biological molecules that are...
a) of animal origin b) at least partially hydrophobic c) hydrophilic
d) entirely composed of N, O, and H e) both c and d
36. Triglycerides include...
a) oils b) fats c) steroids d) a and b but not c e) a, b, and c
37. A diet high in saturated fats will tend to ...
a) elevate blood low density lipoprotein (LDL) b) lower blood high density lipoprotein (HDL)
c) increase the risk of cardiovascular disease d) b and c but not a e) a, b, and c
38. The industrial “hydrogenation” process converts ...
a) cellulose to amylose b) cis fatty acids to trans fatty acids c) fats to water
d) vegetable oils to vegetable fats e) carbohydrates to fats
39. During hydrogenation, so called “partial hydrogenation” converts...
a) cellulose to amylose b) cis fatty acids to trans fatty acids c) fats to water
d) vegetable oils to vegetable fats e) carbohydrates to fats
40. Cells are bounded by membranes composed primarily of...
a) sucrose b) fats c) oils d) phospholipids e) carbohydrates

41. Which of the following steroids is not a hormone?
 a) testosterone b) cholesterol c) estradiol (an estrogen) d) ecdysone e) brassinolide
42. Abuse of synthetic anabolic steroids will often yield athletic benefits resulting from ...
 a) blood thickening b) quicker reaction times c) increased muscle mass
 d) increased stamina e) weight loss
43. Abuse of synthetic anabolic steroids is dangerous as it results in ...
 a) a rise in LDL (low density lipoprotein) b) a fall in HDL (high density lipoprotein)
 c) liver damage d) changes to heart structure e) all of these
44. Proteins are polymers assembled by bonding together ...
 a) sugars b) fats c) steroids d) amino acids e) phospholipids
45. Most proteins have _____ shape and function as _____.
 a) hexagonal lubricants b) rectangular coagulators c) globular enzymes
 d) star-shaped impeters e) fluffy dispersers
46. The tertiary structure of a protein refers to...
 a) the age of its constituent parts b) the number of its subunits
 c) its sequence of amino acids d) its repeating structures e) its overall shape
47. Nucleic acids include ...
 a) RNA and DNA b) proteins and DNA c) lipids and proteins
 d) carbohydrates and proteins e) triglycerides and proteins
48. The nucleotides of DNA include...
 a) AUGC b) UTAG c) ATGC d) UGCT e) AUTC
49. In nucleotides of DNA where is an O missing that is found in the nucleotides of RNA?
 a) at the 1' carbon b) at the 2' carbon c) at the 3' carbon
 d) at the 4' carbon e) at the 5' carbon
50. DNA also differs from RNA in that it is ...
 a) single stranded b) double stranded c) contains T
 d) both a and c e) both b and c