

Science CPT Review and Practice Test

The Science CPT exam: The test you are being asked to take covers the same content as the BIO 070, Basic Biological Concepts Course described below. The test has 20 multiple choice questions covering the 16 competencies. If you score 12/20, 60% or better you do not need to take BIO 070. This Science placement test or BIO 070 is only a prerequisite to Nutrition, BIO 151 and Anatomy and Physiology I, BIO 169.

BIO 070 Basic Biological Concepts Course Description: This is a developmental course that provides a basic foundation for further course work in biological sciences designed for the student with little or no background in biology or chemistry, or for students who need a refresher course. Topics covered include cell structure and function, enzymes, biochemical pathways, DNA and RNA, mitosis and meiosis and biologically emphasized chemistry. **Credit for this class does not apply to graduation requirements.**

Course Competencies:

At the conclusion of the course the student will be able to:

1. Name inorganic compounds and molecules and provide their chemical formula.
2. Predict Bohr's model of the atom using the periodic table.
3. Apply the definition of an acid, a base, a buffer and the pH scale.
4. Recognize the organic functional groups: hydroxyl, carbonyl, carboxyl and amino in a chemical structure or name.
5. Identify the number of carbons in the longest continuous carbon chain of an organic compound given its IUPAC name.
6. Use the electronegativity differences of atoms in a molecule to predict the physical properties of molecules.
7. Categorize molecules within each classification and differentiate between the classes of macromolecules: nucleic acids, carbohydrates, lipids, and proteins.
8. Differentiate between the levels of protein structure.
9. Describe the differences between DNA and RNA.
10. Recognize enzymes by name.
11. Explain how factors such as temperature, pH and substrate concentration affect enzymatic activity.
12. Describe the key events in DNA replication, transcription and translation.
13. Match cell structures with their function.
14. Predict the flow of material in osmosis and diffusion.
15. Describe the steps involved in mitosis and meiosis and identify similarities and differences.
16. Summarize the metabolic processes; glycolysis, Krebs cycle (TCA cycle) and the electron transport chain in terms of the starting reactant(s), end product(s) and energy storage compounds produced.

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1. PCl_3 is called?
 - a. Phosphorous chloride
 - b. Potassium chloride
 - c. Phosphorous trichloride
 - d. Potassium trichloride
2. CaBr_2 is called?
 - a. calcium dibromide
 - b. carbon dibromide
 - c. monocalcium dibromide
 - d. calcium bromide
3. Barium fluoride has the formula...
 - a. BaF
 - b. BF
 - c. BaFl
 - d. BaF_2
4. Dinitrogen pentoxide has the formula...
 - a. NO
 - b. N_2O_5
 - c. N_2O
 - d. N_2O_7
5. How many valence shell electrons does a neutral atom of oxygen have?
 - a. 2
 - b. 4
 - c. 6
 - d. 12
6. How many valence shell electrons does a neutral atom of strontium have?
 - a. 2
 - b. 4
 - c. 38
 - d. 88
7. An aqueous solution with a pH of 12 is classified as a/an
 - a. acid
 - b. base
 - c. neutral
 - d. none of the above
8. If most colas have a pH 2.2 they are classified as a/an
 - a. acid
 - b. base
 - c. neutral
 - d. none of the above

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9. What functional group is present in an amide?
- OH
 - CONH₂
 - CHO
 - COOH
10. What functional group is present in an alcohol?
- OH
 - NH₂
 - CHO
 - COOH
11. Butane is a hydrocarbon containing _____ carbons?
- 3
 - 4
 - 5
 - 6
12. Ethanol is an alcohol containing _____ carbons?
- 1
 - 2
 - 3
 - 4
13. What is the intermolecular force present between molecules of water?
- Covalent bonds
 - Ionic bonds
 - Hydrogen bonds
 - London dispersion forces
14. What is the intermolecular force present between molecules of methane, CH₄?
- Covalent bonds
 - Ionic bonds
 - Hydrogen bonds
 - London dispersion forces
15. Lactose is an example of a
- lipid
 - carbohydrate
 - nucleic acid
 - protein
16. Glycogen is an example of a
- monosaccharide
 - polysaccharide
 - trisaccharide
 - disaccharide

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17. Cholesterol is an example of a
- lipid
 - carbohydrate
 - nucleic acid
 - protein
18. The amino acid sequence, His-Lys-Pro-Gly-Ala-Ser-Pro-Phe-Arg....describes a protein's
- primary structure
 - secondary structure
 - tertiary structure
 - quarternary structure
19. Beta sheets are examples of protein
- primary structure
 - secondary structure
 - tertiary structure
 - quarternary structure
20. DNA differs from RNA because
- DNA is double stranded and RNA is single stranded
 - DNA has the nitrogenous bases A,C, G, and T, RNA has the bases A,C, G and U.
 - DNA has 2'deoxyribose sugar, RNA has ribose sugar
 - all of the above
21. Lactase is a/an
- carbohydrate
 - lipid
 - enzyme
 - hormone
22. Carboxypeptidase is a/an
- carbohydrate
 - lipid
 - enzyme
 - hormone
23. An enzyme's activity is affected by
- temperature
 - pH
 - concentration of substrate
 - all of the above
24. Transcription ends at the _____ .
- rho protein or a hairpin loop in the DNA or RNA
 - promoter
 - origin of replication
 - terminator codon

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25. The product of transcription is
- DNA
 - Protein
 - RNA
 - Carbohydrates
26. Translation ends at
- the origin of replication
 - one of 3 stop codons
 - the codon, AUG
 - an exon
27. The product of translation is
- DNA
 - Protein
 - RNA
 - Carbohydrates
28. The organelle where translation and some posttranslational modification occurs
- smooth endoplasmic reticulum
 - rough endoplasmic reticulum
 - nucleus
 - mitochondria
29. The "power house" of the cell where aerobic respiration takes place is called
- smooth endoplasmic reticulum
 - rough endoplasmic reticulum
 - nucleus
 - mitochondria
30. A solution that contains a higher solute concentration (less water) than the cytoplasm of a cell is called a _____ solution.
- merotonic
 - hypertonic
 - isotonic
 - hypotonic
31. If the reference solution has a concentration of 0.9% NaCl, a solution that is 2% NaCl would be
- merotonic
 - hypertonic
 - isotonic
 - hypotonic
32. The process defined as the movement of solvent from low concentration of solution to high concentration of solution through a semipermeable membrane is

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- a. diffusion
- b. active transport
- c. phagocytosis
- d. osmosis

33. Mitosis produces

- a. 4 nonidentical haploid cells
- b. a cell with smaller number chromosomes
- c. 2 identical diploid daughter cells
- d. a cell with larger number chromosomes

34. Glycolysis begins with _____ and ends with _____.

- a. glucose, acetyl CoA
- b. glucose, pyruvate
- c. pyruvate, NAD
- d. pyruvate, glucose.

35. The metabolic process that occurs in the mitochondrial matrix is called?

- a. TCA cycle (Krebs cycle, citric acid cycle)
- b. glycolysis
- c. Electron transport chain
- d. Cori cycle

Answers:

1. c, 2. d., 3d, 4b, 5c, 6a, 7b, 8a, 9b, 10a, 11b, 12b, 13c, 14d, 15b, 16b, 17a, 18a, 19b, 20d, 21c, 22c, 23d, 24a, 25c, 26b, 27b, 28b, 29d, 30b, 31b, 32d, 33c, 34b, 35a.