

| Biology Mini-Exam | |
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| Section A. Multiple choice | |
| 1. At which stage of mitosis are chromosomes usually photographed in the preparation of a karyotype? | |
| a. Prophase b. Metaphase | c. Anaphase d. Telophase |
| 2. Human plasma proteins do not include which of the following? | |
| a. Fibrinogen b. Haemoglobin | c. Immunoglobulin d. Albumin |
| Section B. Fill the gaps. | |
| 1. All skeletal muscle fibres are striated and _____. Cardiac muscle is striated and _____. Skeletal muscle cells contain contractile filaments made of _____ and _____. | |
| 2. Ribosomes consist of two major components: the _____ ribosomal subunit, which reads the RNA, and the _____ subunit, which joins amino acids to form a polypeptide chain. Each subunit is composed of one or more _____ molecules and a variety of _____. | |
| Section C. Match the terms in pairs. | |
| 1. cell membrane 2. Ribosome 3. Lysosome 4. Nucleus 5. Mitochondrion | a. intracellular digestion b. hereditary information c. selective permeability d. cellular respiration e. protein synthesis |
| 1. Metaphase 2. Anaphase 3. Telophase 4. Cytokinesis 5. Prophase | a. First b. Second c. Third d. Fourth e. Fifth |
| Section D. True or false? | |
| 1. Sex-linked traits may be defined as those traits that affect the development of sex organs | |
| 2. The nerve tube derives from the ectoderm. | |
| Section E. Open questions. | |
| 1. Explain the different structural levels of organisation of proteins. | |
| 2. What are the main types of numerical disorders (mutations) in the human genome? Give the genotypes. | |

| Chemistry Mini-Exam | |
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| Section A. Multiple choice. | |
| 1. What are the products of the reaction $Zn + CuSO_4 \rightarrow ?$ | |
| a. Zinc sulphate and copper b. Zinc oxide and copper oxide | c. Zinc oxide, copper oxide, and sulphur dioxide d. Zinc oxide, copper oxide, and oxygen |
| 2. The electrons in a nonpolar covalent bond are: | |
| a. Gained b. Lost | c. Shared equally d. Shared unequally |
| Section B. Fill the gaps. | |
| 1. Amino acids are linked together by a(n) _____ bond, created when the carboxylic acid group of one amino acid reacts with the amine group of another amino acid to form a(n) _____ functional group. Condensation is a chemical reaction in which two substances combine to form a larger molecule with the release of a small molecule, such as _____. Protein molecules are described in terms of their primary, _____, and tertiary structures. | |
| 2. Rate of reaction is the change in _____ of a reactant or product per time unit. For a chemical reaction: $nA + mB \rightarrow C + D$ the rate equation or rate law is given by: _____. The main factors that affect the reaction rate are concentration and temperature. The higher the reactants' concentration, the _____ the reaction rate. Usually, an increase in temperature is accompanied by _____ in the reaction rate. | |
| Section C. Match the terms in pairs. | |
| 1. Na ₂ S 2. O ₂ 3. Br ₂ | a. Covalent polar bond, double bond b. Covalent nonpolar bond, single bond c. Covalent nonpolar bond, double bond |
| 4. NH ₃ 5. SO ₂ | d. Covalent polar bond, single bond e. Ionic bond |
| 1. $CH_3-C(=O)-H + 2[Ag(NH_3)_2]OH \rightarrow CH_3-C(=O)-OH + 4NH_3 \uparrow + H_2O + 2Ag \downarrow$ | a. Esterification reaction |
| 2. $CaCO_3 + 2H_2O \rightarrow CH_2=CH_2 + Ca(OH)_2$ | b. Photosynthesis |
| 3. $nCO_2 + nH_2O + \text{energy} \rightarrow C_nH_{2n}O_n + nO_2$ | c. Wohler reaction |
| 4. $R-C(=O)-H + R'OH \rightleftharpoons R-C(=O)-OR' + H_2O$ | d. Fehling's solution test |
| 5. $CH_3-C(=O)-H + 2Cu(OH)_2 \rightarrow CH_3-C(=O)-OH + Cu_2O \downarrow + 2H_2O$ | e. Silver mirror test |
| Section D. True or false? | |
| 1. The rate constant is the rate of reaction at a constant temperature. | |
| 2. CH ₃ CH ₂ CH ₂ CH ₃ is the formula for a saturated hydrocarbon. | |
| Section E. Open questions. | |
| 1. Define electrolytic dissociation. Explain the difference between weak and strong electrolytes. Give two examples of each. | |
| 2. Give a definition for esterification. Explain chemical conditions and present an example with a chemical equation. | |