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| 1. Name the following:   |  |  |  | | --- | --- | --- | |  | a. | isopropane | |  | b. | methylpentane | |  | c. | methylbutane | |  | d. | *n*-pentane | |  | e. | dodecane |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.1 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkane | Chemistry | nomenclature | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:32 PM | | *DATE MODIFIED:* | 3/4/2016 4:32 PM | |

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| 2. Name the following:   |  |  |  | | --- | --- | --- | |  | a. | *n*-heptane | |  | b. | 2-methyl-2-ethylbutane | |  | c. | 3,3-dimethylpentane | |  | d. | 2,2-diethylpropane | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.1 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkane | Chemistry | IUPAC nomenclature | nomenclature | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:32 PM | | *DATE MODIFIED:* | 3/4/2016 4:32 PM | |

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| 3. Name the following: CH3 –CH2 –CH3   |  |  |  | | --- | --- | --- | |  | a. | ethane | |  | b. | propane | |  | c. | butane | |  | d. | pentane | |  | e. | hexane |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.1 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkane | Chemistry | nomenclature | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:32 PM | | *DATE MODIFIED:* | 3/4/2016 4:32 PM | |

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| 4. Name the following:   |  |  |  | | --- | --- | --- | |  | a. | 2,4-diethylpentane | |  | b. | 3,5-dimethylheptane | |  | c. | secondary ethylpentane | |  | d. | 2,3-dimethyl-2,3-diethylpropane | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.1 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkane | Chemistry | IUPAC nomenclature | nomenclature | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:32 PM | | *DATE MODIFIED:* | 3/4/2016 4:32 PM | |

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| 5. Name the following:   |  |  |  | | --- | --- | --- | |  | a. | *n*-hexane | |  | b. | isohexane | |  | c. | 1,2,3-trimethylpropane | |  | d. | methyl-diethylmethane | |  | e. | 3-methylpentane |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.1 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkane | Chemistry | IUPAC nomenclature | nomenclature | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:32 PM | | *DATE MODIFIED:* | 3/4/2016 4:32 PM | |

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| 6. Name the following:                CH3–(CH2)6 –CH3   |  |  |  | | --- | --- | --- | |  | a. | pentane | |  | b. | hexane | |  | c. | heptane | |  | d. | octane | |  | e. | ethane |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.1 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | alkane | Chemistry | nomenclature | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:32 PM | | *DATE MODIFIED:* | 3/4/2016 4:32 PM | |

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| 7. A student gave a molecule the following name:                2-methyl-4-t-butylpentane However, the teacher pointed out that, although the molecule could be correctly drawn from this name, the name violates the IUPAC rules. What is the correct (IUPAC) name of the molecule?   |  |  |  | | --- | --- | --- | |  | a. | 2-t-butyl-4-methylpentane | |  | b. | 2,2,3,5-tetramethylhexane | |  | c. | 2,4,5,5-tetramethylhexane | |  | d. | 1-sec-butyl-1,2,2-trimethylpentane | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.1 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkane | Chemistry | IUPAC nomenclature | nomenclature | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 8. Which of the following names is a correct one?   |  |  |  | | --- | --- | --- | |  | a. | 3-methyl-4-isopropylpentane | |  | b. | 2-ethyl-4-tertiary-butylpentane | |  | c. | 2,2,3,5-tetramethylheptane | |  | d. | t-butylethane | |  | e. | *trans*-1,2-dimethylethane |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.1 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkane | Chemistry | IUPAC nomenclature | nomenclature | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 9. What is the compound whose carbon skeleton (minus any hydrogen atoms) appears below?   |  |  |  | | --- | --- | --- | |  | a. | 2,4-diethyl-3,6-dimethylheptane | |  | b. | 2,5-dimethyl-4,6-diethylheptane | |  | c. | 1,4-diethyl-3,6-dimethyl-tridecane | |  | d. | 5-ethyl-3,6-trimethyloctane | |  | e. | 4-ethyl-2,5,6-trimethyloctane |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.1 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkane | Chemistry | IUPAC nomenclature | nomenclature | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 10. A student gave a molecule the following name: 2-ethyl-3-methyl-5-isopropylhexane However, his TA pointed out that, although the molecule could be correctly drawn from this name, the name violates the systematic rules. What is the correct (systematic) name of the molecule?   |  |  |  | | --- | --- | --- | |  | a. | 3,4-dimethyl-6-isopropylheptane | |  | b. | 2-isopropyl-4,5-dimethylheptane | |  | c. | 3,4,6,7-tetramethyloctane | |  | d. | 1,2-diethyl-3,6,7-trimethylheptane | |  | e. | 2,3,5,6-tetramethyloctane |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.1 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkane | Chemistry | IUPAC nomenclature | nomenclature | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 11. In lecture, the professor named a molecule 4-ethylpentane. An alert student pointed out that although the correct structure could be drawn, the name did not follow systematic rules. What is the correct systematic name for the molecule?   |  |  |  | | --- | --- | --- | |  | a. | 2-ethylpentane | |  | b. | 1-methyl-1-propylpropane | |  | c. | 3-methylhexane | |  | d. | 4-methylhexane | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.1 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkane | Chemistry | IUPAC nomenclature | nomenclature | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 12. The compound below is the carbon skeleton (minus any hydrogen atoms) of  Which of these phrases could be used to describe this compound?   |  |  |  | | --- | --- | --- | |  | I. | C12H26 | |  | II. | a substituted octane | |  | III. | a compound with 3 tertiary carbons | |  | IV. | a compound with 3 secondary carbons | |  | V. | a compound with 2 isopropyl groups |   ​   |  |  |  | | --- | --- | --- | |  | a. | I, II, III | |  | b. | II, III, IV | |  | c. | III, IV, V | |  | d. | II, IV, V | |  | e. | I, II, III, IV |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.1 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | carbon atom | Chemistry | classification of carbon in compounds | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/7/2017 4:16 AM | |

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| 13. Which of the following pairs is incorrect?   |  |  |  | | --- | --- | --- | |  | a. | ethane – C2H4 | |  | b. | pentane – C5H12 | |  | c. | hexane – C6H14 | |  | d. | heptane – C7H16 | |  | e. | octane – C8H18 |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.1 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkane | Chemistry | organic chemistry | structural characteristic | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 14. Why does octane have a higher boiling point than ethane, 126°C versus –89°C?   |  |  |  | | --- | --- | --- | |  | a. | Octane exhibits hydrogen bonding and ethane does not. | |  | b. | Octane has a higher vapor pressure than ethane. | |  | c. | Octane contains more double bonds than ethane. | |  | d. | Octane has stronger London dispersion forces than ethane. | |  | e. | At least two of the above are correct. |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.1 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkane | Chemistry | organic chemistry | physical properties | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 15. How many isomers of C3H8 are there?   |  |  |  | | --- | --- | --- | |  | a. | 1 | |  | b. | 2 | |  | c. | 3 | |  | d. | 5 | |  | e. | 6 |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.1 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkane | Chemistry | isomerism | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 16. Which is a possible product of the chlorination of butane in the presence of light?   |  |  |  | | --- | --- | --- | |  | a. | C4H9Cl | |  | b. | C4H8Cl | |  | c. | C4H10Cl2 | |  | d. | C4H6Cl2 | |  | e. | C4H9Cl2 |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.1 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkane | chemical reaction | Chemistry | halogenation | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 17. Which of the following, upon reacting with oxygen, would form the greatest amount of carbon dioxide?   |  |  |  | | --- | --- | --- | |  | a. | *n*-pentane | |  | b. | isopentane | |  | c. | neopentane | |  | d. | Two of the above would form equal amounts. | |  | e. | All (A-C) of the above would form equal amounts. |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.1 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkane | chemical reaction | Chemistry | combustion | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 18. Cyclobutane has 109° bond angles like all alkanes.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.1 | | *QUESTION TYPE:* | True / False | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | cycloalkane | organic chemistry | structural characteristic | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 19. Name the following:   |  |  |  | | --- | --- | --- | |  | a. | 1-hexyne | |  | b. | 2-ethynyl butane | |  | c. | 2-ethyl-3-butyne | |  | d. | 3-methyl-1-pentyne | |  | e. | 3-methyl-4-pentyne |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.2 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkyne | Chemistry | IUPAC nomenclature | nomenclature | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 20. Name the following:   |  |  |  | | --- | --- | --- | |  | a. | 1,1,1-trichloro-5-bromo-3-pentene | |  | b. | 1-bromo-5,5,5-trichloro-2-pentene | |  | c. | 1,1,1-trichloro-5-bromo-2-pentene | |  | d. | 1,1,1-trichloro-5-bromo-3-pentyne | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.2 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkene | Chemistry | IUPAC nomenclature | nomenclature | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 21. CH3C ≡ CCH2CH2Cl is named:   |  |  |  | | --- | --- | --- | |  | a. | 1-chloro-3-pentyne | |  | b. | 5-chloro-2-pentene | |  | c. | 1-acetylenyl-3-chloropropane | |  | d. | 5-chloro-2-pentyne | |  | e. | 1-chloro-3-pentene |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.2 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkyne | Chemistry | IUPAC nomenclature | nomenclature | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 22. One of the ingredients on a margarine container is listed as "polyunsaturated corn oil." This means that:   |  |  |  | | --- | --- | --- | |  | a. | All the carbon bonds in the oil are single bonds. | |  | b. | Many of the polymer bonds are unsaturated. | |  | c. | All the carbon–carbon bonds are triple bonds. | |  | d. | Many of the carbon–carbon bonds are multiple bonds. | |  | e. | None of these. |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.2 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkene | Chemistry | organic chemistry | structural characteristic | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 23. Consider the following four compounds:   Which are the same molecule?   |  |  |  | | --- | --- | --- | |  | a. | I and II | |  | b. | I and III | |  | c. | II and III | |  | d. | III and IV | |  | e. | I and IV |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.2 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkene | Chemistry | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 24. Consider the molecule *trans*-2-butene. Which statement is true?   |  |  |  | | --- | --- | --- | |  | a. | The molecule has two π bonds. | |  | b. | There is free rotation around every bond in the molecule. | |  | c. | *Cis*-2-butene is its structural isomer. | |  | d. | Carbon #2 exhibits *sp*2 hybridization. | |  | e. | None of the above. |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.2 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkene | Chemistry | organic chemistry | structural characteristic | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 25. Hydrocarbons containing a carbon–carbon triple bond are called   |  |  |  | | --- | --- | --- | |  | a. | alkynes | |  | b. | alkenes | |  | c. | cyclic alkanes | |  | d. | aldehydes | |  | e. | alkanes |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.2 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkyne | Chemistry | organic chemistry | structural characteristic | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 26. How many of the following molecules exist?   |  |  |  | | --- | --- | --- | |  | I. | methene | |  | II. | cycloethane | |  | III. | cyclopropyne | |  | IV. | neobutane |   ​   |  |  |  | | --- | --- | --- | |  | a. | 0 | |  | b. | 1 | |  | c. | 2 | |  | d. | 3 | |  | e. | 4 |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.2 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | carbon atom | Chemistry | hydrocarbons and hydrocarbon derivative | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/7/2017 4:43 AM | |

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| 27. How many isomers are there of "dichloroethene"?   |  |  |  | | --- | --- | --- | |  | a. | 2 | |  | b. | 3 | |  | c. | 4 | |  | d. | 5 | |  | e. | 6 |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.2 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkene | Chemistry | isomerism | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 28. Propane undergoes dehydrogenation. The product of this is   |  |  |  | | --- | --- | --- | |  | a. | 1-propene | |  | b. | 2-propene | |  | c. | *cis*-1-propene | |  | d. | *trans*-1-propene | |  | e. | *cis*-2-propene |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.2 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkene | Chemistry | organic chemistry | sources | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 29. Chemical reactions involving alkanes in which hydrogen atoms are removed and the product is an unsaturated hydrocarbon are called   |  |  |  | | --- | --- | --- | |  | a. | combustion reactions | |  | b. | dehydrogenation reactions | |  | c. | substitution reactions | |  | d. | addition reactions | |  | e. | polymerization reactions |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.2 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkene | Chemistry | organic chemistry | sources | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 30. Name the following:   |  |  |  | | --- | --- | --- | |  | a. | 2-chloro-3-chloro-*cis*-2-butene | |  | b. | 2,3-dichloro-*cis*-2-butene | |  | c. | 2,3-dichloro-*trans*-2-butene | |  | d. | 1-chloro-1-methyl-2-chloro-propene | |  | e. | 2,3-dichloro-1-methyl-propene |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.2 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkene | Chemistry | cis-trans isomer | isomerism | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 31. Which of the following compounds can exhibit geometrical isomerism?   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.2 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkene | Chemistry | cis-trans isomer | isomerism | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 32. How many structural and geometrical isomers are there of chloropropene?   |  |  |  | | --- | --- | --- | |  | a. | 2 | |  | b. | 3 | |  | c. | 4 | |  | d. | 5 | |  | e. | more than 5 |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.2 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkene | Chemistry | isomerism | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 33. How many geometric isomers can be drawn for the following compound: CH3CH=CHCH2CH=C(CH3)2   |  |  |  | | --- | --- | --- | |  | a. | 2 | |  | b. | 3 | |  | c. | 4 | |  | d. | 5 | |  | e. | 6 |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.2 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkene | Chemistry | cis-trans isomer | isomerism | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 34. Which of the following is not a structural isomer of 1-pentene?   |  |  |  | | --- | --- | --- | |  | a. | 2-pentene | |  | b. | 2-methyl-2-butene | |  | c. | cyclopentane | |  | d. | 3-methyl-1-butene | |  | e. | 1-methyl-cyclobutene |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.2 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkene | Chemistry | isomerism | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 35. What is the compound represented by the following structure?   |  |  |  | | --- | --- | --- | |  | a. | cyclohexene, C6H10 | |  | b. | cyclohexane, C6H12 | |  | c. | cyclohexatriene, C6H9 | |  | d. | cyclohexatriene, C6H12 | |  | e. | benzene, C6H6 |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.3 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | aromatic hydrocarbons | Chemistry | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 36. How many different possible dimethylbenzenes exist?   |  |  |  | | --- | --- | --- | |  | a. | 2 | |  | b. | 3 | |  | c. | 4 | |  | d. | 5 | |  | e. | 6 |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.3 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | aromatic hydrocarbons | Chemistry | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 37. What is the most characteristic reaction of benzene?   |  |  |  | | --- | --- | --- | |  | a. | oxidation | |  | b. | reduction | |  | c. | substitution | |  | d. | addition | |  | e. | addition and elimination |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.3 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | aromatic hydrocarbons | chemical reaction | Chemistry | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 38. Mothballs contain what aromatic hydrocarbon?   |  |  |  | | --- | --- | --- | |  | a. | naphthalene | |  | b. | benzene | |  | c. | anthracene | |  | d. | phenanthrene | |  | e. | toluene |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.3 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | aromatic hydrocarbons | Chemistry | fused-ring aromatic compound | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 39. Name the following:   |  |  |  | | --- | --- | --- | |  | a. | methyl alcohol | |  | b. | ethyl alcohol | |  | c. | propyl alcohol | |  | d. | isopropyl alcohol | |  | e. | butanol |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alcohol | Chemistry | nomenclature | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 40. Which of the following is known as wood alcohol?   |  |  |  | | --- | --- | --- | |  | a. | methanol | |  | b. | ethanol | |  | c. | propanol | |  | d. | isopropanol | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alcohol | Chemistry | common name | nomenclature | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 41. Which of the following is known as rubbing alcohol?   |  |  |  | | --- | --- | --- | |  | a. | methanol | |  | b. | ethanol | |  | c. | propanol | |  | d. | isopropanol | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alcohol | Chemistry | common name | nomenclature | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 42. What alcohols have the greatest commercial value?   |  |  |  | | --- | --- | --- | |  | a. | methanol and ethanol | |  | b. | methanol and phenol | |  | c. | ethanol and phenol | |  | d. | 1-propanol and ethanol | |  | e. | 1-propanol and methanol |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alcohol | Chemistry | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 43. Which of the following has only one single C-O bond?   |  |  |  | | --- | --- | --- | |  | a. | ketone | |  | b. | alcohol | |  | c. | ether | |  | d. | ester | |  | e. | aldehyde |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alcohol | Chemistry | organic chemistry | structural characteristic | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 44. The boiling point of methanol is much higher than that of ethane. This is primarily due to   |  |  |  | | --- | --- | --- | |  | a. | the difference in molar masses of methanol and ethane | |  | b. | the hydrogen bonding in methanol | |  | c. | the significant molecular size difference between methanol and ethane | |  | d. | the carbon oxygen double bond in the methanol | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alcohol | Chemistry | organic chemistry | structural characteristic | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 45. Classify the following molecule:   |  |  |  | | --- | --- | --- | |  | a. | primary alcohol | |  | b. | secondary alcohol | |  | c. | tertiary alcohol | |  | d. | ether | |  | e. | phenol |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alcohol | Chemistry | organic chemistry | structural characteristic | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 46. Which of the following is found in beverages such as wine?   |  |  |  | | --- | --- | --- | |  | a. | methanol | |  | b. | ethanol | |  | c. | propanol | |  | d. | isopropanol | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alcohol | Chemistry | organic chemistry | sources | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 47. When C4H8 is treated with water and H2SO4, a tertiary alcohol is produced. Which of the following structures could represent C4H8 in this reaction?   |  |  |  | | --- | --- | --- | |  | a. | CH3CH=CHCH3 | |  | b. | CH3CH2CH=CH2 | |  | c. |  | |  | d. | CH3CH2CH2CH3 | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkene | chemical reaction | Chemistry | hydration | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 48. Oxidation of a primary alcohol results in a(n) \_\_\_\_\_\_\_\_\_\_ and oxidation of a secondary alcohol results in a(n) \_\_\_\_\_\_\_\_\_.   |  |  |  | | --- | --- | --- | |  | a. | carboxylic acid, amine | |  | b. | aldehyde, ketone | |  | c. | ester, ether | |  | d. | ketone, aldehyde | |  | e. | amine, carboxylic acid |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alcohol | chemical reaction | Chemistry | organic chemistry | oxidation | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 49. When the following organic compound is oxidized, what is the major organic product?   |  |  |  | | --- | --- | --- | |  | a. | 3-pentanoic acid | |  | b. | 3-pentanol | |  | c. | 3-pentanone | |  | d. | 3-pentanal | |  | e. | No reaction takes place. |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alcohol | chemical reaction | Chemistry | organic chemistry | oxidation | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 50. Name the following:   |  |  |  | | --- | --- | --- | |  | a. | acetone | |  | b. | butyraldehyde | |  | c. | diethylketone | |  | d. | diethyl ether | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | common name | ethers | nomenclature | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 51. Identify the functional group present in the following organic compound:   |  |  |  | | --- | --- | --- | |  | a. | ester | |  | b. | aldehyde | |  | c. | ether | |  | d. | ketone | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | cyclic ether | ethers | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 52. Which molecule is an ether?   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. | CH3CH2OCH3 | |  | c. |  | |  | d. | CH3CH2NH2 | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | ethers | organic chemistry | structural characteristic | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 53. Name the following:   |  |  |  | | --- | --- | --- | |  | a. | 2-chloro-3-ethyl-1-isopropylbutanone | |  | b. | isopropyl-chloro,methylbutyl ketone | |  | c. | 2-butyl,chloro,isobutanoyl methane | |  | d. | 4-chloro-2,5-dimethyl-3-heptanone | |  | e. | 3-methyl-4-chloro-1-isopropylpentanone |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | IUPAC nomenclature | ketone | nomenclature | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 54. Identify the type of organic compound shown:   |  |  |  | | --- | --- | --- | |  | a. | aldehyde | |  | b. | ester | |  | c. | amine | |  | d. | alcohol | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | ketone | organic chemistry | structural characteristic | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 55. Identify the type of organic compound shown:   |  |  |  | | --- | --- | --- | |  | a. | aldehyde | |  | b. | ester | |  | c. | amine | |  | d. | ketone | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | aldehyde | Chemistry | organic chemistry | structural characteristic | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 56. Which molecule is a ketone?   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. | CH3CH2OCH3 | |  | c. |  | |  | d. | CH3CH2NH2 | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | ketone | organic chemistry | structural characteristic | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 57. Classify the following molecule:   |  |  |  | | --- | --- | --- | |  | a. | acid | |  | b. | aldehyde | |  | c. | amine | |  | d. | ketone | |  | e. | carbonyl |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | aldehyde | Chemistry | organic chemistry | structural characteristic | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 58. Classify the following molecule:   |  |  |  | | --- | --- | --- | |  | a. | acid | |  | b. | aldehyde | |  | c. | amine | |  | d. | ketone | |  | e. | carbonyl |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | ketone | organic chemistry | structural characteristic | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 59. Which of the following yields a primary alcohol upon reduction?   |  |  |  | | --- | --- | --- | |  | a. | a ketone | |  | b. | an alkene | |  | c. | an amine | |  | d. | an aldehyde | |  | e. | an ether |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Difficult | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | aldehyde | chemical reaction | Chemistry | organic chemistry | reduction | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 60. Which of the following becomes more soluble in water upon addition of NaOH?   |  |  |  | | --- | --- | --- | |  | a. | an amine | |  | b. | a carboxylic acid | |  | c. | an aromatic hydrocarbon | |  | d. | an alkane | |  | e. | two of these |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | carboxylic acid salt | carboxylic acids | Chemistry | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 61. Which of the following will yield a carboxylic acid upon oxidation?   |  |  |  | | --- | --- | --- | |  | a. | a secondary alcohol | |  | b. | an aldehyde | |  | c. | a cycloalkane | |  | d. | a ketone | |  | e. | tertiary alcohol |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | carboxylic acids | Chemistry | organic chemistry | preparation | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 62. What organic molecules have the general formula RCOOH?   |  |  |  | | --- | --- | --- | |  | a. | esters | |  | b. | alcohols | |  | c. | carboxylic acids | |  | d. | ketones | |  | e. | aldehydes |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | carboxylic acids | Chemistry | organic chemistry | structural characteristic | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 63. Name the following:   |  |  |  | | --- | --- | --- | |  | a. | *n*-propyl acetate | |  | b. | isopropyl formate | |  | c. | isopropyl acetate | |  | d. | ethyl propanoate | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | esters | nomenclature | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 64. What is the common name for acetylsalicylic acid?   |  |  |  | | --- | --- | --- | |  | a. | orange juice | |  | b. | aspirin | |  | c. | acetone | |  | d. | bananas | |  | e. | vinegar |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | common name | esters | nomenclature | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 65. What organic compounds often have pleasant fruity odors?   |  |  |  | | --- | --- | --- | |  | a. | ethers | |  | b. | alkynes | |  | c. | carboxylic acids | |  | d. | esters | |  | e. | amines |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | esters | organic chemistry | physical properties | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 66. Which of the following has a double C-O bond and a single C-O bond?   |  |  |  | | --- | --- | --- | |  | a. | aldehyde | |  | b. | carboxylic acid | |  | c. | alcohol | |  | d. | amine | |  | e. | ether |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | True | | *KEYWORDS:* | Chemistry | esters | organic chemistry | structural characteristic | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 67. Referring to the structures below, which statement is true?   |  |  |  | | --- | --- | --- | |  | I. |  | |  | II. |  | |  | III. |  |   ​   |  |  |  | | --- | --- | --- | |  | a. | I and II have different molecular formulas. | |  | b. | I and III are structural isomers of each other. | |  | c. | II and III are stereoisomers of each other. | |  | d. | II and III are different conformations of the same compound. | |  | e. | I and III are the same compound. |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | esters | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/7/2017 5:07 AM | |

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| 68. Identify the type of organic compound shown:   |  |  |  | | --- | --- | --- | |  | a. | aldehyde | |  | b. | ester | |  | c. | amine | |  | d. | ketone | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | esters | organic chemistry | structural characteristic | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 69. Which molecule is an ester?   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. | CH3CH2OCH3 | |  | c. |  | |  | d. | CH3CH2NH2 | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | esters | organic chemistry | structural characteristic | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 70. If you were to heat pentanoic acid and 2-butanol with a catalytic amount of strong acid, you would most likely discover in your flask:   |  |  |  | | --- | --- | --- | |  | a. | a ketone | |  | b. | an ester | |  | c. | an amine | |  | d. | an alkane | |  | e. | an aldehyde |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | esterification reaction | esters | organic chemistry | preparation | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 71. A carboxylic acid will react with an alcohol to form a(n) \_\_\_\_\_\_\_\_\_\_ and a water molecule.   |  |  |  | | --- | --- | --- | |  | a. | ester | |  | b. | amine | |  | c. | polymer | |  | d. | ketone | |  | e. | aldehyde |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | esterification reaction | esters | organic chemistry | preparation | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 72. Aspirin is formed via a(n) \_\_\_\_\_\_\_\_\_\_ reaction.   |  |  |  | | --- | --- | --- | |  | a. | combustion | |  | b. | hydrogenation | |  | c. | addition | |  | d. | condensation | |  | e. | substitution |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | esterification reaction | esters | organic chemistry | preparation | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 73. Which of the following types of compounds must have an *sp*2-hybridized carbon center?   |  |  |  | | --- | --- | --- | |  | a. | ethers | |  | b. | ketones | |  | c. | alcohols | |  | d. | alkanes | |  | e. | amines |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | True | | *KEYWORDS:* | bonding characteristics | carbon atom | Chemistry | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/9/2017 4:57 AM | |

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| 74. Which of the following functional groups does *not* contain a doubly bonded oxygen (C=O)?   |  |  |  | | --- | --- | --- | |  | a. | Aldehyde. | |  | b. | Carboxyl. | |  | c. | Ketone. | |  | d. | Carboxylic acid. | |  | e. | All contain a double bond. |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 75. H2CCHCH2N(CH3)2 is   |  |  |  | | --- | --- | --- | |  | a. | an alkyne and a secondary amine | |  | b. | an alkene and a primary amine | |  | c. | an alkene and a tertiary amine | |  | d. | an alkyne and a tertiary amine | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | amines | Chemistry | classification | organic chemistry | structural characteristic | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 76. Identify the type of organic compound shown: (CH3)3N   |  |  |  | | --- | --- | --- | |  | a. | aldehyde | |  | b. | ester | |  | c. | amine | |  | d. | ketone | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | amines | Chemistry | organic chemistry | structural characteristic | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 77. Which molecule is an amine?   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. | CH3CH2OCH3 | |  | c. |  | |  | d. | CH3CH2NH2 | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | amines | Chemistry | organic chemistry | structural characteristic | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 78. Classify the following molecule:   |  |  |  | | --- | --- | --- | |  | a. | primary amine | |  | b. | secondary amine | |  | c. | tertiary amine | |  | d. | amino acid | |  | e. | peptide |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | amines | Chemistry | classification | organic chemistry | structural characteristic | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 79. Identify the secondary amine.   |  |  |  | | --- | --- | --- | |  | a. | CH3NH2 | |  | b. | (CH3)2NH | |  | c. |  | |  | d. | NH3 | |  | e. | (CH3)3N |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | amines | Chemistry | classification | organic chemistry | structural characteristic | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 80. For which of the following compound(s) are *cis* and *trans* isomers possible?   |  |  |  | | --- | --- | --- | |  | a. | 2,3-dimethyl-2-butene | |  | b. | 3-methyl-2-pentene | |  | c. | 4,4-dimethylcyclohexanol | |  | d. | *ortho*-chlorotoluene | |  | e. | All can exhibit *cis*/*trans* isomers. |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | geometric isomer | organic chemistry | stereochemistry | stereoisomer | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 81. Which of the following has an optical isomer?   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | chirality | organic chemistry | stereochemistry | stereoisomer | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 82. Which structure represents an optically active aldehyde?   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | chirality | organic chemistry | stereochemistry | stereoisomer | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 83. Pick the optically active molecule from the following.   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | chirality | organic chemistry | stereochemistry | stereoisomer | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 84. Which of the following molecules exhibits chirality?   |  |  |  | | --- | --- | --- | |  | a. | CH4 | |  | b. | CH3OH | |  | c. | CH3CH2OH | |  | d. |  | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | chirality | organic chemistry | stereochemistry | stereoisomer | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 85. Which of the following is optically active (i.e., chiral)?   |  |  |  | | --- | --- | --- | |  | a. | HN(CH3)2 | |  | b. | CH2Cl2 | |  | c. | 2-chloropropane | |  | d. | 2-chlorobutane | |  | e. | 3-chloropentane |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | chirality | organic chemistry | stereochemistry | stereoisomer | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 86. Identify all the functional groups present in the following organic compound: 1) ketone, 2) aldehyde, 3) acid, 4) alcohol, 5) ether, 6) ester, 7) amine.   |  |  |  | | --- | --- | --- | |  | a. | 2,6 | |  | b. | 2,5 | |  | c. | 1,2 | |  | d. | 1,2,5 | |  | e. | 3,4 |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 87. Teflon is an example of a   |  |  |  | | --- | --- | --- | |  | a. | copolymer | |  | b. | homopolymer | |  | c. | dimer | |  | d. | two of these | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.5 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | addition polymer | alkene | Chemistry | organic chemistry | polymerization | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 88. Teflon is a type of   |  |  |  | | --- | --- | --- | |  | a. | nylon | |  | b. | PVC | |  | c. | elastomer | |  | d. | polymer | |  | e. | synthetic rubber |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.5 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | general chemistry | polymer | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 89. Consider the polymer drawn below:            What monomer(s) is (are) needed to produce the above polymer?   |  |  |  | | --- | --- | --- | |  | a. | CH2 = CH2 and CH3CH = CH2 | |  | b. | CH2 = C(CH3)2 | |  | c. | CH3CH = CHCH3 | |  | d. | CO and CH2 = CH2 | |  | e. | none of the above |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.5 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | addition polymer | alkene | Chemistry | organic chemistry | polymerization | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 90. The polymer  is formed by addition of   |  |  |  | | --- | --- | --- | |  | a. | CH2=CH-CH3 | |  | b. | CH3CH2CH3 | |  | c. | CH3–CH=CH–CH3 | |  | d. | H2C=CH–CH=CH2 | |  | e. | CH3CH=C(CH3)2 |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.5 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | addition polymer | alkene | Chemistry | organic chemistry | polymerization | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 91. Which of the following pairs of substances could form an addition copolymer?   |  |  |  | | --- | --- | --- | |  | a. | H2C=CHCH3 + HOCH2CH2COOH | |  | b. | HO(CH2)4COOH + HOCH2CH=CHCH3 | |  | c. | H2C=CHCH + H2C=CHCH3 | |  | d. | HOCH2CH2OH + HOOCCOOH | |  | e. | H2NCH2COOH + H2NCH2CH2COOH |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.5 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | addition copolymer | alkene | Chemistry | organic chemistry | polymerization | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 92. The structure of the polymer used in a freezer wrap can mainly be described as follows:                [CCl2 –CH2 –CCl2–CH2 –CCl2 –CH2 –CCl2 –CH2]*n* The chief monomer of this wrap would have which structure?   |  |  |  | | --- | --- | --- | |  | a. | CCl2=CH2 | |  | b. | Cl2C–CH2 | |  | c. | Cl2C=CH2=CCl2 | |  | d. | CCl2 | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.5 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | addition polymer | alkene | Chemistry | organic chemistry | polymerization | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 93. Which of the following polymers is not based on a substituted ethylene monomer?   |  |  |  | | --- | --- | --- | |  | a. | nylon | |  | b. | polyvinylchloride | |  | c. | Teflon | |  | d. | polystyrene | |  | e. | polypropylene |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.5 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | addition copolymer | alkene | Chemistry | organic chemistry | polymerization | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 94. The greatest single use for PVC is   |  |  |  | | --- | --- | --- | |  | a. | credit cards | |  | b. | table cloths and mats | |  | c. | pipe and pipe fittings | |  | d. | garden hose | |  | e. | toys |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.5 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkene | Chemistry | organic chemistry | polymerization | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 95. No atoms are lost from starting material in making which kind of polymer?   |  |  |  | | --- | --- | --- | |  | a. | condensation polymer | |  | b. | polyester polymer | |  | c. | addition polymer | |  | d. | vulcanized polymer | |  | e. | branched polymer |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.5 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | addition polymer | Chemistry | general chemistry | polymer | synthesis of organic polymer | synthetic polymer | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 96. The formula below is the repeating unit of a   |  |  |  | | --- | --- | --- | |  | a. | homopolymer formed by an addition reaction | |  | b. | homopolymer formed by a condensation reaction | |  | c. | copolymer formed by an addition reaction | |  | d. | copolymer formed by a condensation reaction | |  | e. | polyester formed by an addition reaction |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.5 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | condensation polymer | general chemistry | polymer | synthesis of organic polymer | synthetic polymer | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 97. Which of the following pairs of substances could form a polyester?   |  |  |  | | --- | --- | --- | |  | a. | H2C=CHCH3 + HOCH2CH2COOH | |  | b. | HO(CH2)4COOH + HOCH2CH=CHCH3 | |  | c. | H2C=CHCN + H2C=CHCH3 | |  | d. | HOCH2CH2OH + HOOCCOOH | |  | e. | H2NCH2COOH + H2NCH2CH2COOH |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.5 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | esters | organic chemistry | polyester | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 98. Which of the following monomers are used to produce the polymer:   |  |  | | --- | --- | | I. |  | | II. |  | | III. |  |  |  |  |  | | --- | --- | --- | |  | a. | I | |  | b. | II | |  | c. | III | |  | d. | I and III | |  | e. | II and III |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.5 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | esters | organic chemistry | polyester | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 99. What monomer(s) is (are) needed to make the polymer shown below?   |  |  |  | | --- | --- | --- | |  | I. | HOCH2CH2OH | |  | II | HOOCCH2CH2COOH | |  | III. | HOCH2CH2COOH | |  | IV. | HOCH=CHOH | |  | V. | HOOCCH=CHCOOH |   ​   |  |  |  | | --- | --- | --- | |  | a. | II | |  | b. | III | |  | c. | I and II | |  | d. | IV and V | |  | e. | II and III |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.5 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | esters | organic chemistry | polyester | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/7/2017 5:24 AM | |

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| 100. In condensation polymerization, a common by-product is:   |  |  |  | | --- | --- | --- | |  | a. | ethylene | |  | b. | alcohol | |  | c. | aldehyde | |  | d. | water | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.5 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | condensation polymer | general chemistry | polymer | synthesis of organic polymer | synthetic polymer | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 101. Dacron is an example of a   |  |  |  | | --- | --- | --- | |  | a. | copolymer | |  | b. | homopolymer | |  | c. | dimer | |  | d. | two of these | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.5 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | general chemistry | polymer | synthesis of organic polymer | synthetic polymer | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 102. In each pair below the relative strength of the polymer types is indicated with the stronger polymer on the right. Which comparison is wrong?   |  |  |  | | --- | --- | --- | |  | a. | low molecular weight < high molecular weight | |  | b. | polyamide (e.g., nylon) < polyhydrocarbon (e.g., polyethylene) | |  | c. | branched < linear | |  | d. | low density < high density | |  | e. | atactic < isotactic |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Difficult | | *REFERENCES:* | 22.5 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | general chemistry | polymer | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 103. When sulfur is added to rubber and the mixture is heated, the resulting rubber is still elastic but much stronger. This process is called   |  |  |  | | --- | --- | --- | |  | a. | addition polymerization | |  | b. | isomerization | |  | c. | oligomerization | |  | d. | vulcanization | |  | e. | halogenation |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.5 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | general chemistry | polymer | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 104. Which factor is not characteristic of a strong polymer?   |  |  |  | | --- | --- | --- | |  | a. | high crystallinity | |  | b. | branching | |  | c. | strong intermolecular forces | |  | d. | high molecular weight | |  | e. | isotactic |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Difficult | | *REFERENCES:* | 22.5 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | general chemistry | polymer | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 105. The major use for linear low-density polyethylene (LDPE) is in the manufacturing of   |  |  |  | | --- | --- | --- | |  | a. | pipes | |  | b. | film for packaging | |  | c. | Teflon | |  | d. | rubber | |  | e. | carpets |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.5 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | general chemistry | polymer | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 106. HDPE, or high-density polyethylene, is a highly recyclable material because:   |  |  |  | | --- | --- | --- | |  | a. | It has a high molecular weight (molar mass). | |  | b. | It is both strong and tough. | |  | c. | It is a thermoplastic polymer. | |  | d. | It is a thermoset polymer. | |  | e. | None of these. |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.5 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | general chemistry | polymer | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 107. Which of the following will increase the rigidity of a polymer?   |  |  |  | | --- | --- | --- | |  | a. | shorter polymer chains | |  | b. | making chains more branched | |  | c. | decreasing cross-linking | |  | d. | introducing the possibility of hydrogen bonding between chains | |  | e. | using atactic instead of isotactic chains |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.5 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | general chemistry | polymer | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 108. Polystyrene is an addition polymer of styrene. What would be the effect if some divinylbenzene was added to styrene and then polymerized?   |  |  |  | | --- | --- | --- | |  | a. | The second polymer would be made less flammable than pure polystyrene. | |  | b. | The polymer would be more flexible. Divinylbenzene acts as a plasticizer. | |  | c. | Divinylbenzene would act as a cross-linking agent, making the polymer stronger. | |  | d. | There would be no effect on the properties of the polymer. | |  | e. | There would be an effect, but it cannot be predicted. |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.5 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | general chemistry | polymer | synthesis of organic polymer | synthetic polymer | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 109. How many of the following apply to globular proteins?   |  |  |  | | --- | --- | --- | |  | I. | Provide structural integrity and strength for many types of tissues. | |  | II. | Transport and store oxygen and nutrients. | |  | III. | Act as catalysts. | |  | IV. | Are the main components of muscle, hair, and cartilage. | |  | V. | Fight invasion of the body by foreign objects. |  |  |  |  | | --- | --- | --- | |  | a. | 1 | |  | b. | 2 | |  | c. | 3 | |  | d. | 4 | |  | e. | 5 |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | globular | protein classification | proteins and amino acids | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 110. How many of the following apply to fibrous proteins?   |  |  |  | | --- | --- | --- | |  | I. | Provide structural integrity and strength for many types of tissues. | |  | II. | Transport and store oxygen and nutrients. | |  | III. | Act as catalysts. | |  | IV. | Are the main components of muscle, hair, and cartilage. | |  | V. | Fight invasion of the body by foreign objects. |  |  |  |  | | --- | --- | --- | |  | a. | 1 | |  | b. | 2 | |  | c. | 3 | |  | d. | 4 | |  | e. | 5 |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | fibrous | protein classification | proteins and amino acids | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 111. Which of the following is *not* a function of proteins?   |  |  |  | | --- | --- | --- | |  | a. | Structure. | |  | b. | Catalysis. | |  | c. | Oxygen transport. | |  | d. | Energy transformation. | |  | e. | All of these are functions of proteins. |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | proteins and amino acids | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 112. Which one of the following statements about the structure of proteins is incorrect?   |  |  |  | | --- | --- | --- | |  | a. | Disulfide bonds provide strong intrachain interactions. | |  | b. | Hydrogen bonding stabilizes the α-helix proteins. | |  | c. | Nonpolar groups tend to face the outside of a protein in an aqueous solution. | |  | d. | Ionized amino acid side chains can form salt bridges within a protein. | |  | e. | Heat can disrupt tertiary structure. |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | physical structure of protein | proteins and amino acids | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 113. The building blocks of all proteins are   |  |  |  | | --- | --- | --- | |  | a. | pleated sheets | |  | b. | alpha amino acids | |  | c. | alpha helices | |  | d. | tertiary structures | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | amino acid | biochemistry | Chemistry | proteins and amino acids | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 114. What are the building blocks of proteins?   |  |  |  | | --- | --- | --- | |  | a. | nucleotides | |  | b. | glucose and sucrose | |  | c. | lipids | |  | d. | amino acids | |  | e. | esters |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | amino acid | biochemistry | Chemistry | proteins and amino acids | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 115. A polypeptide is   |  |  |  | | --- | --- | --- | |  | a. | an addition polymer of amino acids | |  | b. | a condensation polymer of amino acids | |  | c. | a polymer of sugar molecules | |  | d. | a part of nucleic acids | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | amino acid | biochemistry | Chemistry | peptide formation | proteins and amino acids | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 116. The condensation product of two amino acids is a(n)   |  |  |  | | --- | --- | --- | |  | a. | dipeptide | |  | b. | glycol | |  | c. | ether | |  | d. | ester | |  | e. | diastereomer |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | amino acid | biochemistry | Chemistry | peptide formation | proteins and amino acids | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 117. Nonpolar amino acid side chains contain substituents made mostly of what atoms?   |  |  |  | | --- | --- | --- | |  | a. | carbon and hydrogen | |  | b. | nitrogen and oxygen | |  | c. | carbon and nitrogen | |  | d. | carbon and oxygen | |  | e. | nitrogen and hydrogen |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | amino acid | biochemistry | Chemistry | classification | proteins and amino acids | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 118. Polar amino acid side chains contain functional groups containing mostly what atoms?   |  |  |  | | --- | --- | --- | |  | a. | carbon and hydrogen | |  | b. | nitrogen and oxygen | |  | c. | carbon and nitrogen | |  | d. | carbon and oxygen | |  | e. | nitrogen and hydrogen |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | amino acid | biochemistry | Chemistry | classification | proteins and amino acids | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 119. Which of the following is incorrect?   |  |  |  | | --- | --- | --- | |  | a. | Nonpolar amino acid side chains are hydrophobic. | |  | b. | Polar amino acid side chains are hydrophilic. | |  | c. | Nonpolar amino acid side chains contain hydrogen. | |  | d. | Polar amino acid side chains contain nitrogen. | |  | e. | Both polar and nonpolar amino acid side chains contain oxygen atoms. |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | amino acid | biochemistry | Chemistry | classification | proteins and amino acids | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 120. Consider the two amino acids below. The circled portion of each amino acid represents their R groups, or side chains.                  Leucine                 Asparagine Which of the following statements are true?   |  |  |  | | --- | --- | --- | |  | a. | Leucine's side chain is polar and asparagine's side chain is nonpolar. | |  | b. | The side chain on asparagine is hydrophilic. | |  | c. | Asparagine is used to make polypeptides, but leucine is not. | |  | d. | Leucine's large side chain makes it very reactive and unstable. | |  | e. | At least two of the above statements are true. |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | amino acid | biochemistry | Chemistry | proteins and amino acids | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 121. Which of the following is the best description of a protein?   |  |  |  | | --- | --- | --- | |  | a. | an alternating chain of amino acids and nucleic acids | |  | b. | a chain of amino acids connected by ester bonds | |  | c. | two antiparallel chains of nucleic acids connected by hydrogen bonding | |  | d. | a chain of amino acids formed by condensation polymerization | |  | e. | a chain of nucleotides connected by phosphodiester bonds |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | proteins and amino acids | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 122. The structures of proteins are partially determined by the order of various amino acids in the macromolecule. This level of structural determination is known as   |  |  |  | | --- | --- | --- | |  | a. | primary structure | |  | b. | secondary structure | |  | c. | tertiary structure | |  | d. | quaternary structure | |  | e. | order of bases |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | physical structure of protein | primary structure | proteins and amino acids | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 123. The analysis of a protein for its amino acid content is valuable in determining the protein's   |  |  |  | | --- | --- | --- | |  | a. | tertiary structure | |  | b. | secondary structure | |  | c. | quaternary structure | |  | d. | primary structure | |  | e. | main structure |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | physical structure of protein | primary structure | proteins and amino acids | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 124. The primary structure of a protein chain is   |  |  |  | | --- | --- | --- | |  | a. | the order of amino acids | |  | b. | the arrangement of the chain in the long molecule | |  | c. | the overall shape of the protein | |  | d. | determined by the types of bonds it contains | |  | e. | determined by the side chains |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | physical structure of protein | primary structure | proteins and amino acids | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 125. How many possible sequences can be made for a polypeptide with six different amino acids?   |  |  |  | | --- | --- | --- | |  | a. | 6 | |  | b. | 36 | |  | c. | 64 | |  | d. | 720 | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | amino acid | biochemistry | Chemistry | peptide formation | proteins and amino acids | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/29/2017 12:24 PM | |

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| 126. Hydrogen bonding between C=O groups and NH groups in the backbone of a protein determines the   |  |  |  | | --- | --- | --- | |  | a. | primary structure | |  | b. | secondary structure | |  | c. | tertiary structure | |  | d. | quaternary structure | |  | e. | all of these |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | physical structure of protein | proteins and amino acids | secondary structure | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 127. The alpha helix of a protein is held in a coiled conformation partly because of   |  |  |  | | --- | --- | --- | |  | a. | hydrogen bonding | |  | b. | optical activity | |  | c. | active sites | |  | d. | double bonding | |  | e. | ionization energies |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | physical structure of protein | proteins and amino acids | secondary structure | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 128. A pleated sheet arrangement of proteins   |  |  |  | | --- | --- | --- | |  | a. | is found in muscle fibers | |  | b. | contains interchain hydrogen bonds | |  | c. | is found in silk fibers | |  | d. | results when hydrogen bonds occur between protein chains | |  | e. | all of these |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | physical structure of protein | proteins and amino acids | secondary structure | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 129. An example of a secondary structure of a protein is   |  |  |  | | --- | --- | --- | |  | a. | an alpha amino acid | |  | b. | a peptide linkage | |  | c. | a pleated sheet | |  | d. | serine | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | physical structure of protein | proteins and amino acids | secondary structure | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 130. In order to give someone a "permanent" (permanent waving of hair), these must be broken and reformed.   |  |  |  | | --- | --- | --- | |  | a. | disulfide linkages | |  | b. | pleated sheets | |  | c. | alpha helices | |  | d. | alpha amino acids | |  | e. | globular proteins |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | physical structure of protein | proteins and amino acids | tertiary structure | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 131. The overall shape of a protein is maintained by   |  |  |  | | --- | --- | --- | |  | a. | hydrogen bonding | |  | b. | ionic bonds | |  | c. | dipole-dipole bonding | |  | d. | covalent bonds | |  | e. | all of these |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | physical structure of protein | proteins and amino acids | tertiary structure | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 132. Which statement (A–D) is false with respect to proteins?   |  |  |  | | --- | --- | --- | |  | a. | Primary structure refers to the sequence of nucleotides. | |  | b. | Secondary structure includes α-helixes. | |  | c. | Tertiary structure includes disulfide bonds. | |  | d. | The overall shape of a protein is related to the tertiary structure. | |  | e. | All are false. |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | physical structure of protein | proteins and amino acids | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 133. The secondary and tertiary structures of most biomolecules are determined by   |  |  |  | | --- | --- | --- | |  | a. | hydrophobic bonding | |  | b. | hydrogen bonding | |  | c. | salt bridges | |  | d. | disulfide bonds | |  | e. | all of these |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | physical structure of protein | proteins and amino acids | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 134. When heat is added to proteins, the hydrogen bonding in the secondary structure breaks apart. What are the algebraic signs of Δ*H* and Δ*S* for the denaturation process?   |  |  |  | | --- | --- | --- | |  | a. | Both Δ*H* and Δ*S* are positive. | |  | b. | Both Δ*H* and Δ*S* are negative. | |  | c. | Δ*H* is positive and Δ*S* is negative. | |  | d. | Δ*H* is negative and Δ*S* is positive. | |  | e. | Δ*H* is positive and Δ*S* is 0. |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | protein denaturation | proteins and amino acids | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 135. The process of breaking down the three-dimensional structure of a protein is called   |  |  |  | | --- | --- | --- | |  | a. | degradation | |  | b. | denaturation | |  | c. | decomposition | |  | d. | fission | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | protein denaturation | proteins and amino acids | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 136. Which of the following is *not* a monosaccharide?   |  |  |  | | --- | --- | --- | |  | a. | Sucrose. | |  | b. | Glucose. | |  | c. | Fructose. | |  | d. | Galactose. | |  | e. | All of these are monosaccharides. |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | carbohydrates | Chemistry | monosaccharide | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 137. The following represents the structure of a carbohydrate. Which of the choices would more specifically classify this compound?   |  |  |  | | --- | --- | --- | |  | a. | Hexose and ketose | |  | b. | Pentose and aldose | |  | c. | Hexose and aldose | |  | d. | Pentose and ketose | |  | e. | Tetrose and aldose |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | aldose | biochemistry | carbohydrates | Chemistry | monosaccharide | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 138. Which of the following would be the correct classification of the carbohydrate shown below?   |  |  |  | | --- | --- | --- | |  | a. | monosaccharide | |  | b. | disaccharide | |  | c. | polysaccharide | |  | d. | starch | |  | e. | cellulose |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | carbohydrates | Chemistry | disaccharide | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 139. The monomers that make up a starch molecule are:   |  |  |  | | --- | --- | --- | |  | I. | optically active | |  | II. | not optically active | |  | III. | aldehydes | |  | IV. | ketones | |  |  | and the polymer itself is formed primarily by: | |  | V. | addition. | |  | VI. | condensation. |  |  |  |  | | --- | --- | --- | |  | a. | I, III, V | |  | b. | II, IV, VI | |  | c. | I, III, VI | |  | d. | II, IV, V | |  | e. | I, IV, VI |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | carbohydrates | Chemistry | common disaccharide | disaccharide | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 140. Table sugar is a disaccharide formed from   |  |  |  | | --- | --- | --- | |  | a. | alpha-D-glucose and fructose | |  | b. | beta-D-glucose and fructose | |  | c. | D-galactose and D-ribose | |  | d. | D-galactose and fructose | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | carbohydrates | Chemistry | common disaccharide | disaccharide | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 141. All of the following statements about carbohydrates are true except which one?   |  |  |  | | --- | --- | --- | |  | a. | They serve as a food source for most organisms. | |  | b. | They are used as a structural material for plants. | |  | c. | Many have the empirical formula CH2O. | |  | d. | Starch and cellulose are two important carbohydrates made of monosaccharides. | |  | e. | Fructose, a sugar found in fruit, has five carbon atoms. |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | carbohydrates | Chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 142. Which of the following pairs is incorrect?   |  |  |  | | --- | --- | --- | |  | a. | sucrose – disaccharide | |  | b. | starch – polysaccharide | |  | c. | glycogen – disaccharide | |  | d. | cellulose – polysaccharide | |  | e. | fructose – monosaccharide |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | carbohydrates | Chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 143. What carbohydrate is the form in which plants store glucose for future use as cellular fuel?   |  |  |  | | --- | --- | --- | |  | a. | starch | |  | b. | cellulose | |  | c. | glycogen | |  | d. | sucrose | |  | e. | fructose |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | carbohydrates | Chemistry | common polysaccharide | polysaccharide | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 144. Which of the following is a carbohydrate reservoir for animals?   |  |  |  | | --- | --- | --- | |  | a. | starch | |  | b. | cellulose | |  | c. | glycogen | |  | d. | two of these | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | metabolism of carbohydrates | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 145. What carbohydrate breaks down rapidly when energy is needed?   |  |  |  | | --- | --- | --- | |  | a. | starch | |  | b. | cellulose | |  | c. | glycogen | |  | d. | sucrose | |  | e. | fructose |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | metabolism of carbohydrates | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 146. Which of the following can be found both in DNA and RNA?   |  |  |  | | --- | --- | --- | |  | a. | ribose | |  | b. | deoxyribose | |  | c. | uracil | |  | d. | phosphate | |  | e. | thymine |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | nucleic acids | nucleotide | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 147. What does a nucleotide contain?   |  |  |  | | --- | --- | --- | |  | a. | a sugar and a phosphate only | |  | b. | a sugar, a phosphate, and an organic base | |  | c. | amino acids | |  | d. | a sugar | |  | e. | four organic bases |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | nucleic acids | nucleotide | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 148. Protein synthesis in a human occurs   |  |  |  | | --- | --- | --- | |  | a. | in the nucleus | |  | b. | on the ribosomes in the cytoplasm | |  | c. | on the cell membranes | |  | d. | by reading pairs of tRNA nucleotides called codons | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | DNA replication and repair | nucleic acids | protein synthesis | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 149. Which of the following is (are) not necessary for protein synthesis at the time and place where synthesis occurs?   |  |  |  | | --- | --- | --- | |  | a. | amino acids | |  | b. | mRNA | |  | c. | DNA | |  | d. | tRNA | |  | e. | ribosomes |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | DNA replication and repair | nucleic acids | protein synthesis | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 150. The complimentary nucleic acid sequence for the following DNA sequence—GAC TAC GTT AGC—is   |  |  |  | | --- | --- | --- | |  | a. | GAC TAC GTT AGC | |  | b. | TCA GCA TGG CTA | |  | c. | CGA TTG CAT CAG | |  | d. | CTG ATG CAA TCG | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | DNA structure and function | nucleic acids | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 151. The complimentary nucleic acid sequence for the following DNA sequence—ATG GAC GTA TTC—is   |  |  |  | | --- | --- | --- | |  | a. | ATG GAC GTA TTC | |  | b. | TAC CTG CAT AAG | |  | c. | CGT TCA TGC GGA | |  | d. | CTT ATG CAG GTA | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | DNA structure and function | nucleic acids | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 152. The complimentary nucleic acid sequence for the following DNA sequence—CTG ACT TAC GCT—is   |  |  |  | | --- | --- | --- | |  | a. | AGT CAG GCA TAG | |  | b. | CTG ACT TAC GCT | |  | c. | GAC TGA ATG CGA | |  | d. | TCG CAT TCA GTC | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | DNA structure and function | nucleic acids | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 153. Which of the following organic bases is not found in RNA?   |  |  |  | | --- | --- | --- | |  | a. | adenine | |  | b. | guanine | |  | c. | cytosine | |  | d. | thymine | |  | e. | uracil |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | nucleic acids | RNA structure and function | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 154. What type of bonding occurs between two consecutive nucleotides in RNA?   |  |  |  | | --- | --- | --- | |  | a. | ester | |  | b. | amide | |  | c. | hydrogen | |  | d. | ionic | |  | e. | hydrophobic |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | nucleic acids | RNA structure and function | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 155. Which of the following has the smallest molar mass?   |  |  |  | | --- | --- | --- | |  | a. | mRNA | |  | b. | dRNA | |  | c. | rRNA | |  | d. | sRNA | |  | e. | tRNA |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | nucleic acids | RNA structure and function | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 156. An anticodon   |  |  |  | | --- | --- | --- | |  | a. | is part of tRNA | |  | b. | complements the codon on mRNA | |  | c. | codes for a specific amino acid | |  | d. | is a sequence of three bases | |  | e. | all of the above |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | anticodons and tRNA | biochemistry | Chemistry | nucleic acids | RNA | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 157. Which of the following statements is correct?   |  |  |  | | --- | --- | --- | |  | a. | No one has ever made a polymer using amide bonds. | |  | b. | Nucleic acids are made of nucleotides joined together with amide bonds. | |  | c. | The primary structure of DNA is determined by the order of amino acids. | |  | d. | All of the above (A-C) statements are true. | |  | e. | None of these. |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 158. Which statement is true?   |  |  |  | | --- | --- | --- | |  | a. | Protein synthesis takes place in the cytoplasm of the cell. | |  | b. | Each gene in the DNA molecule codes for a specific protein. | |  | c. | Messenger RNA can be found in both the nucleus and the cytoplasm of each cell. | |  | d. | When a peptide bond is formed, H2O is produced. | |  | e. | All of these. |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | biochemistry | Chemistry | nucleic acids | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 159. Indicate the total number of isomers in the following compound: C4H10   |  |  | | --- | --- | | *ANSWER:* | 2 | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.1 | | *QUESTION TYPE:* | Subjective Short Answer | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkane | Chemistry | isomerism | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 160. Draw the isomers for C4H10.   |  |  | | --- | --- | | *ANSWER:* | See Sec. 22.1 of Zumdahl, *Chemistry*. | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.1 | | *QUESTION TYPE:* | Subjective Short Answer | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkane | Chemistry | isomerism | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| Write molecular equations for the following reactions: |

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| 161. halogenation of ethane   |  |  | | --- | --- | | *ANSWER:* | C2H6 + Cl2 C2H5Cl + HCl  See Sec. 22.1 of Zumdahl, *Chemistry*. | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.1 | | *QUESTION TYPE:* | Subjective Short Answer | | *HAS VARIABLES:* | False | | *PREFACE NAME:* | Ref 22-1 | | *KEYWORDS:* | alkane | chemical reaction | Chemistry | halogenation | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 162. methyl substitution of benzene   |  |  | | --- | --- | | *ANSWER:* | C6H6 + CH3Cl C6H5CH3 + HClSee Sec. 22.3 of Zumdahl, *Chemistry*. | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.3 | | *QUESTION TYPE:* | Subjective Short Answer | | *HAS VARIABLES:* | False | | *PREFACE NAME:* | Ref 22-1 | | *KEYWORDS:* | aromatic hydrocarbons | chemical reaction | Chemistry | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 163. formation of propyl propanoate   |  |  | | --- | --- | | *ANSWER:* | CH3CH2COOH + CH3CH2CH2OH → CH3CH2COOCH2CH2CH3 + H2O  See Sec. 22.4 of Zumdahl, *Chemistry*. | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Subjective Short Answer | | *HAS VARIABLES:* | False | | *PREFACE NAME:* | Ref 22-1 | | *KEYWORDS:* | Chemistry | esterification reaction | esters | organic chemistry | preparation | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 164. hydration of 2-butene   |  |  | | --- | --- | | *ANSWER:* | See Sec. 22.4 of Zumdahl, *Chemistry*. | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Subjective Short Answer | | *HAS VARIABLES:* | False | | *PREFACE NAME:* | Ref 22-1 | | *KEYWORDS:* | alkene | chemical reaction | Chemistry | hydration | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 165. Draw and name the missing reactant below.  ? + Cl2 CHCl3 + HCl   |  |  | | --- | --- | | *ANSWER:* | dichloromethane, CH2Cl2             See Sec. 22.1 of Zumdahl, *Chemistry*. | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.1 | | *QUESTION TYPE:* | Subjective Short Answer | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkane | chemical reaction | Chemistry | halogenation | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 166. Draw and name the missing product below.   |  |  | | --- | --- | | *ANSWER:* | nitrobenzene             See Sec. 22.3 of Zumdahl, *Chemistry*. | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.3 | | *QUESTION TYPE:* | Subjective Short Answer | | *HAS VARIABLES:* | False | | *KEYWORDS:* | aromatic hydrocarbons | chemical reaction | Chemistry | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 167. Draw and name the two possible missing products below.   |  |  |  | | --- | --- | --- | |  | acid catalyst |  | | CH3CH = CH2  + H2O |  | **?** |  |  |  | | --- | --- | | *ANSWER:* | 1-propanol                                           2-propanol                      See Sec. 22.4 of Zumdahl, *Chemistry*. | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Subjective Short Answer | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkene | chemical reaction | Chemistry | hydration | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 168. Describe the relationship between pentane and 2-methylpentane   |  |  |  | | --- | --- | --- | |  | a. | optical isomers | |  | b. | structural isomers | |  | c. | geometric isomers | |  | d. | not isomers but different compounds | |  | e. | same compound |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.1 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkane | Chemistry | isomerism | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 169. Describe the relationship between hexane and 2-methylpentane   |  |  |  | | --- | --- | --- | |  | a. | optical isomers | |  | b. | structural isomers | |  | c. | geometric isomers | |  | d. | not isomers but different compounds | |  | e. | same compound |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.1 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkane | Chemistry | isomerism | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 170. Describe the relationship between 1,2-dimethylcyclohexane and 1,2-dimethylcycloheptane   |  |  |  | | --- | --- | --- | |  | a. | optical isomers | |  | b. | structural isomers | |  | c. | geometric isomers | |  | d. | not isomers but different compounds | |  | e. | same compound |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.1 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkane | Chemistry | isomerism | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 171. Describe the relationship between 1,2-dimethylcyclohexane and 1-octene:   |  |  |  | | --- | --- | --- | |  | a. | optical isomers | |  | b. | structural isomers | |  | c. | geometric isomers | |  | d. | not isomers but different compounds | |  | e. | same compound |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.1 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkane | Chemistry | isomerism | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 172. What type of reaction(s) are predominantly undergone by alkanes?   |  |  |  | | --- | --- | --- | |  | a. | elimination | |  | b. | addition | |  | c. | substitution | |  | d. | reduction | |  | e. | both A and B |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 22.1 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alkane | chemical reaction | Chemistry | organic chemistry | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 173. Which of the following is an ester?   |  |  |  | | --- | --- | --- | |  | a. | R-O-R | |  | b. | R-COOH | |  | c. | R-CO-R | |  | d. | R-CONHR | |  | e. | RCOOR |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | esters | organic chemistry | structural characteristic | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 174. 3-methyl-4-propyl-2-octanol is an example of a   |  |  |  | | --- | --- | --- | |  | a. | primary alcohol | |  | b. | secondary alcohol | |  | c. | tertiary alcohol | |  | d. | ether | |  | e. | phenol |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alcohol | Chemistry | organic chemistry | structural characteristic | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 175. 3-ethyl-3-hexanol is an example of a   |  |  |  | | --- | --- | --- | |  | a. | primary alcohol | |  | b. | secondary alcohol | |  | c. | tertiary alcohol | |  | d. | ether | |  | e. | phenol |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | alcohol | Chemistry | organic chemistry | structural characteristic | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 176. 4-hydroxytoluene is an example of a   |  |  |  | | --- | --- | --- | |  | a. | primary alcohol | |  | b. | secondary alcohol | |  | c. | tertiary alcohol | |  | d. | ether | |  | e. | phenol |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | organic chemistry | phenol | structural characteristic | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 177. Which of the following compounds IS chiral (has optical isomers)?   |  |  |  | | --- | --- | --- | |  | a. | 2,4-dimethylpentane | |  | b. | 2-methylhexane | |  | c. | 4-methylheptane | |  | d. | 3-methylpentane | |  | e. | None of these is chiral |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | chirality | organic chemistry | stereochemistry | stereoisomer | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |

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| 178. Which of the following compounds is NOT chiral?   |  |  |  | | --- | --- | --- | |  | a. | CHBrClF | |  | b. | CH3CBrCl2 | |  | c. | 2,3-dimethylpentane | |  | d. | 3-methylhexane | |  | e. | They are all chiral |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 22.4 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | chirality | organic chemistry | stereochemistry | stereoisomer | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:33 PM | | *DATE MODIFIED:* | 3/4/2016 4:33 PM | |