# December 6, 2009 Test 4A Chemistry 104

**Student’s Name:**

|  |  |  |
| --- | --- | --- |
| **Answer** | **Answer** | **Answer** |
| 1. **A** | 1. **A** | 1. **B** |
| 1. **B** | 1. **C** | 1. **A** |
| 1. **C** | 1. **D** | 1. **B** |
| 1. **A** | 1. **A** | 1. **A** |
| 1. **D** | 1. **C** | 1. **B** |
| 1. **A** | 1. **D** | 1. **B** |
| 1. **B, C** | 1. **B** | 1. **D** |
| 1. **C** | 1. **B** | 1. **B** |
| 1. **B** | 1. **D** | 1. **D** |
| 1. **D** | 1. **A** | 1. **A** |
| 1. **D** | 1. **C** | 1. **B** |
| 1. **A** |  |  |

**Short Answers**

1. (2 pts) Sketch and name a tertiary alcohol with 4-carbon atoms (show all atoms present).
2. (6pts) Draw the structure of the major organic product of each of the following reactions and name each one of them:

|  |  |  |
| --- | --- | --- |
| Reactants | Products | Name of product |
|  | (ketone on carbon 2) | Butanone |
|  |  | 3-pentanol |
|  |  | Sodium pentanoate |

1. (2 pts) Draw the structure of 2-butanamine. Identify the chiral atom.



1. (2pts) In the following equation, identify the acid, base, conjugate acid, and conjugate base.



acid\_\_\_\_\_HNO3\_\_\_\_\_\_\_\_ conjugate acid \_\_\_ CH3NH3 +\_\_\_\_\_\_

base \_\_\_CH3NH2\_\_\_\_\_\_\_\_\_\_ conjugate base \_NO3¯\_\_\_\_\_\_\_\_\_\_\_\_

5. (3pts) Shown below is a Fisher projection of galactose.  
 

|  |  |
| --- | --- |
| 1. Is the galactose structure shown above D or an L sugar? | This is the D-isomer (-OH) is to the right. |
| 1. Draw the structure of the product formed when carbon-1 of galactose is oxidized by Benedict's solution. | The structure has an acid group (-COOH) on carbon-1. |