Chemistry 2541, Fall 2017
Quiz 3

(30 points)

Key

Important notes:

- Please use the provided Scantron form for your answers; you can keep the sheet with the questions and can use it as scratch paper
- Do not forget to write your name on the Scantron form
- You will not receive credit for unmarked answers or for more than one mark on answer line
- Your scores will be posted on eGradebook; graded Scantron forms will not be returned to students.

Questions 1-10: Please mark the appropriate box on the front of the Scantron form (3 pts each).

1. Which of the following represents the order of increasing **acidity** for compounds the box?

$\equiv C-H$ (sp) strong energetic $N-H$ $-O-H$

(1) CH_3CH_2I (2) HCl (3) CH_3NH_2 (4) $CH_3CH_2CO_2H$

A) **3** (weakest acid) > **4** > **2** > **1** (strongest acid)
B) **1** (weakest acid) > **3** > **4** > **2** (strongest acid)
C) **1** (weakest acid) > **2** > **3** > **4** (strongest acid)
D) **3** (weakest acid) > **4** > **1** > **2** (strongest acid)

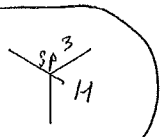
2. Which of the following represents the order of increasing **bacisity** for compounds the box?

weakest ($HO^\ominus$) $CH_3\overset{\ominus}{N}H$ $CH_3O^\ominus$ – opposite to acidity of conj. acids

(1) CH_3OH (2) CH_3NHNa (3) CH_3ONa

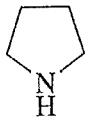
A) **3** (weakest base) > **2** > **1** (strongest base)
B) **3** (weakest base) > **1** > **2** (strongest base)
C) **1** (weakest base) > **2** > **3** (strongest base)
D) **1** (weakest base) > **3** > **2** (strongest base)

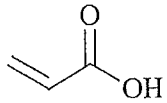
3. Which one of the following compounds has pK_a with the **highest** numeric value?

A) 

$pK_a \approx 60$

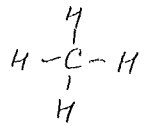
B) HBr

C) 

D) 

4. Which one of the following compounds is the **strongest base**?

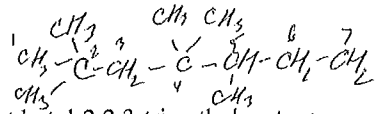
A) CH_3ONa B) NaF C) NaI D) CH_4

$CH_3O^\ominus$ $F^\ominus$ I^- not a base 

5. Which pair represents a **base** and a **conjugate base** for the reaction in the box?

A) **1** and **3** B) **2** and **3** C) **1** and **4** D) **2** and **4**

6. What is the **IUPAC name** for the compound shown in the box?

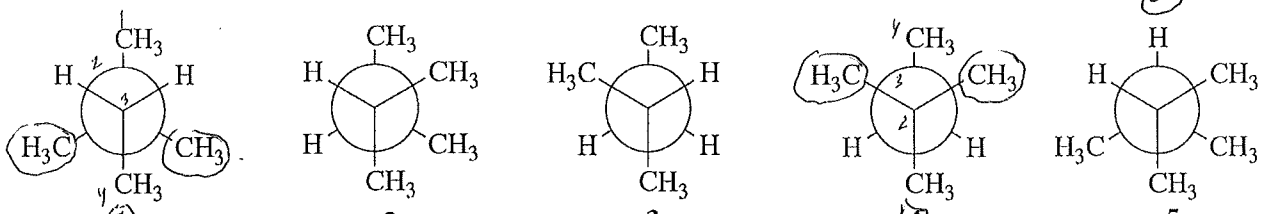


$(CH_3)_3CCH_2C(CH_3)_2CH(CH_3)CH_2CH_3$

A) 3,4,4,5,5-pentamethylheptane B) 1-*tert*-butyl-2,2,3-trimethylpentane

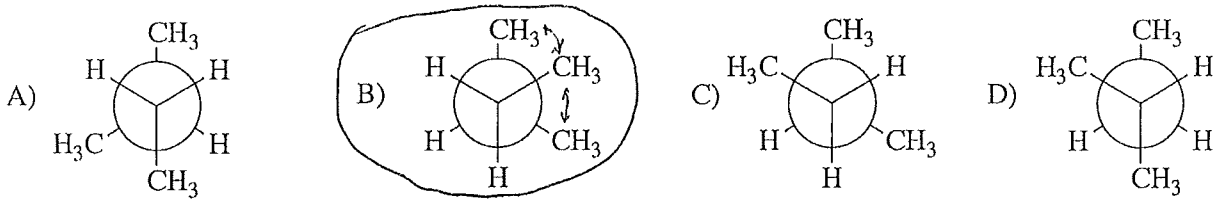
C) 2,2,4,4,5-pentamethylheptane D) 5-ethyl-2,2,4,4-tetramethylhexane

7. Which two of the following Newman projections represent **2,2-dimethylbutane**?

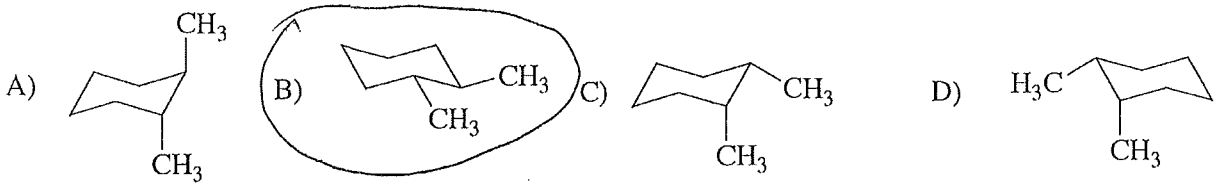


A) **1** and **2** B) **1** and **4** C) **3** and **4** D) **2** and **5**

8. Which one of the following conformers of 2-methylbutane has the **highest energy**?



9. Which one of the following structures of disubstituted cyclohexanes is expected to be **most stable**?



10. The molecule shown in the box contains four methyl groups labeled A, B, C, and D. Which of these methyl groups does not have any **diaxial interaction**?