Homework/Problem Set #10
Chapter 10. Radical Reactions

1. Which of the following reactions would have the smallest energy of activation?

A) \( \text{CH}_4 + \text{Br} \cdot \rightarrow \text{CH}_3 \cdot + \text{HBr} \)
B) \( \text{CH}_3\text{CH}_3 + \text{Br} \cdot \rightarrow \text{CH}_3\text{CH}_2 \cdot + \text{HBr} \)
C) \( \text{CH}_3\text{CHCH}_3 + \text{Br} \cdot \rightarrow \text{CH}_3\text{CHCH}_2 \cdot + \text{HBr} \)
D) \( \text{CH}_3\text{CHCH}_3 + \text{Br} \cdot \rightarrow \text{CH}_3\text{CCH}_3 + \text{HBr} \)
E) \( \text{CH}_3\text{CHCH}_3 + \text{Br} \cdot \rightarrow \text{CH}_3\text{CCH}_2 \cdot + \text{HBr} \)

2. The reaction of 2-methylbutane with chlorine would yield how many monochloro derivatives (include stereoisomers)?

A) 2
B) 3
C) 4
D) 5
E) 6

3. Which would be the best way to carry out the following synthesis?

\( \text{(CH}_3\text{)}_3\text{COH} \rightarrow \text{(CH}_3\text{)}_2\text{CHCH}_2\text{Br} \)

A) (1) HA, heat; (2) HBr
B) (1) HBr and peroxides; (2) Br\(_2/\text{CCl}_4\)
C) (1) HA, heat; (2) HBr and peroxides
D) (1) Br\(_2/\text{CCl}_4\); (2) HA, heat
E) (1) HA, heat; (2) Br\(_2/\text{CCl}_4\)

4. Starting with the cyclopentane and using any other needed reagents complete synthesis of the following diol.