

SECOND TEST

Time 50 Min

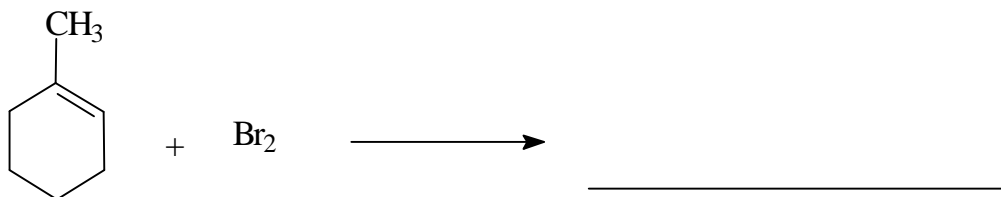
March, 1992

NAME: _____

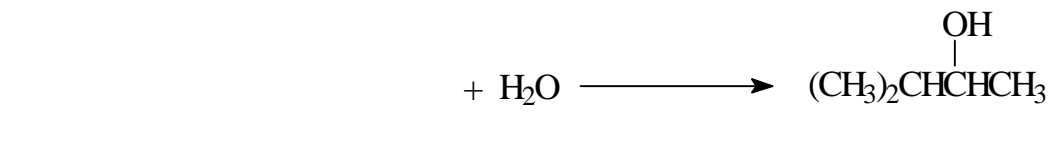
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1. Fill in the blanks with the correct structural formula. Make sure your drawing shows any important stereochemical features. If a catalyst is required for the reaction, show it over the arrow. [30 points]

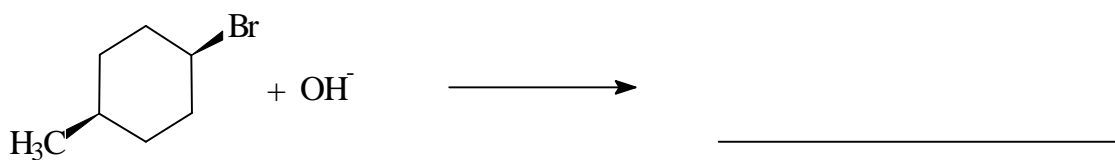
(a)



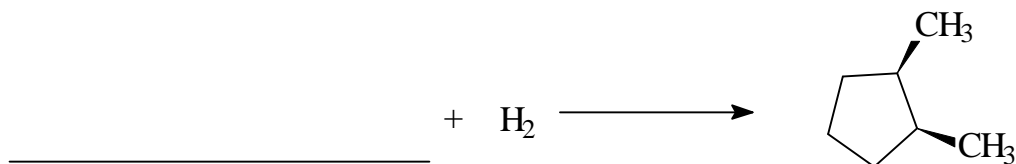
(b)



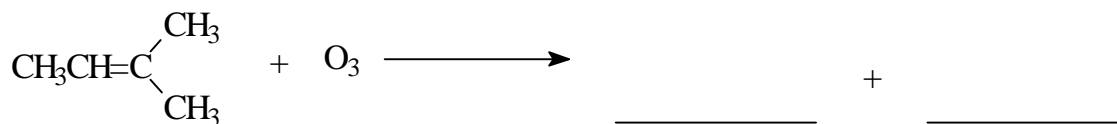
(c)



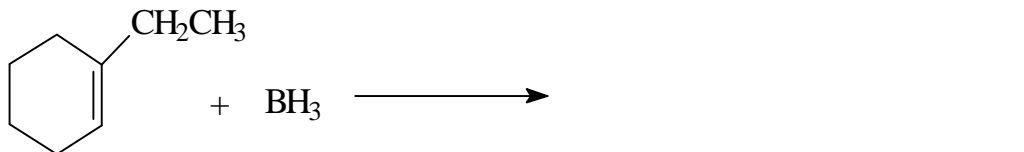
(d)



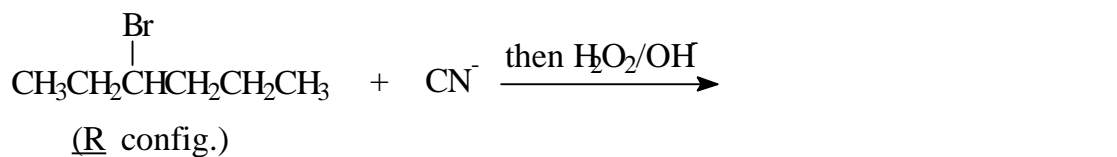
(e)



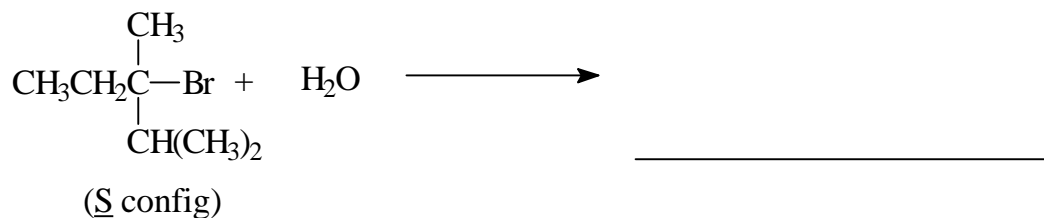
(f)



(g)



(h)



2. On the axes below, draw the energy profile for the following reactions AND, where indicated, give the form of the rate equation in terms of A and B. [18 points]

(a) An exothermic reaction between A and B which occurs in two steps in which the first step is the slower.

(b) a reaction between A and B which occurs in three steps, the last of which is the slowest and whose equilibrium constant is less than one.

(c) a reaction between A and B which occurs in two steps and whose rate depends on the concentration of both A and B.



rate \propto

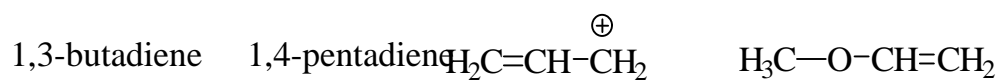


rate \propto

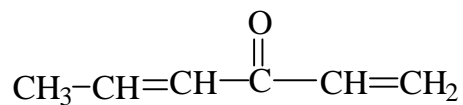
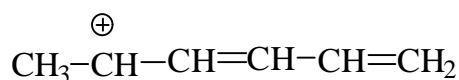


rate \propto [A] [B]

3. (a) Circle those molecules or ions in the list below which are capable of being stabilized by resonance. [10 points]

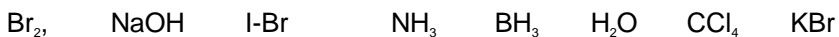


(b) For the two molecules shown, draw as many resonance structures as possible. [10 points]



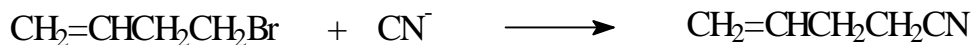
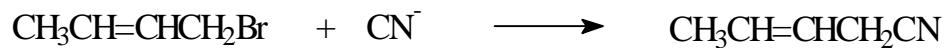
4. Draw the COMPLETE MECHANISM and show all the products obtained for the reaction of a solution of Br_2 in water with 1,3-butadiene. Assume that one molecule of butadiene reacts with ONLY ONE molecule of Br_2 . [10 points]

5. From the following list, circle those reagents which you would expect to react with cyclohexene without the aid of a catalyst. In ten words or less, explain how you made your choices. [10 points]

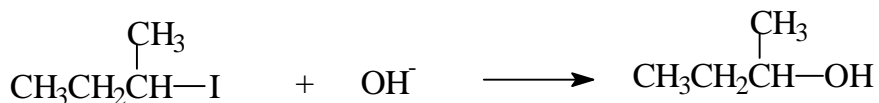
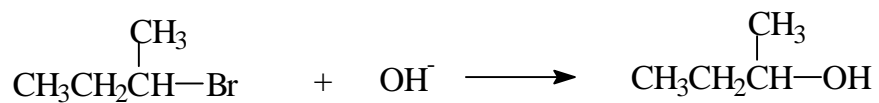


6. For each of the following pairs of reactions, answer the question asked and give a very brief reason for your choice. [4 points each]

(a) Which reaction is more likely to proceed by a S_N1 mechanism and why?



(b) Which reaction is more likely to give a racemic product (and why)?



(c) Which reaction is more likely to give two positional isomers as products (and why)?

