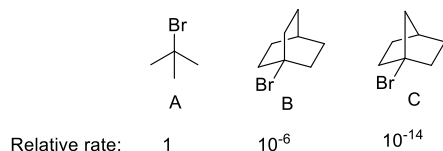


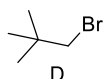


Q1. (a) Explain the stability of cyclopropyl-methyl carbocation (Write in one or two line/s with proper figures). (3)

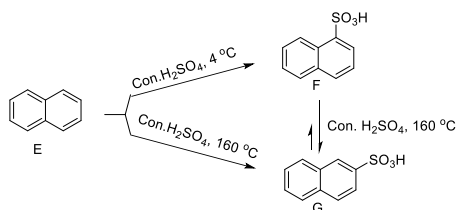
(b) Explain the relative rate of solvolysis for the following three substrates. (2)



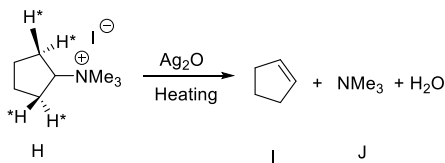
(c) Why both S_N1 and S_N2 type reactions are highly unfavorable for neopentyl-bromide (D). (To the point answer with figures are desirable) (3+2=5)



Q2. (a) Draw the energy profile diagram of the following reaction with correct labelling and explain the temperature dependence of the products. (3+2=5)



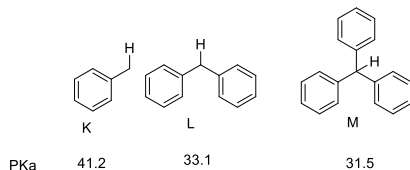
(b) The $k_H/k_D = 4.0$ at 191°C for the following reaction. Explain the mechanism of the reaction with the energy profile diagram. (5)



Q3. (a) How can you prepare Grignard reagents from alkyl halides? Give an example. (2)

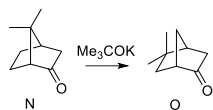
(b) Using only ethanol how can you prepare 2-butanol (You can select any reagents or catalyst)? (3)

(c) Explain the following acidity order of the marked proton within the following substrates. (2)

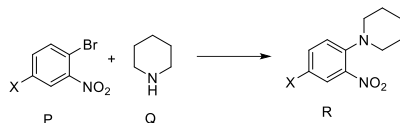


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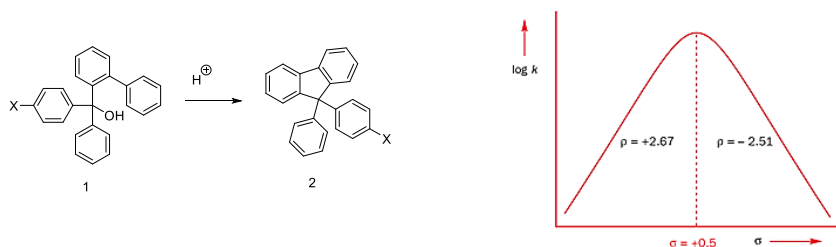
(d) Explain the mechanism of the following transformation. (3)



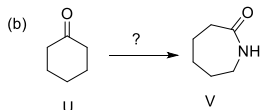
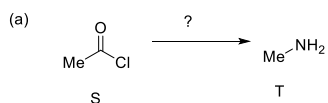
Q4. (a) Write the mechanism of the following reaction. What will be sign of the reaction constant (ρ) for the reaction below? Justify your answer in terms of Hammett relationship. (2+1+3=6)



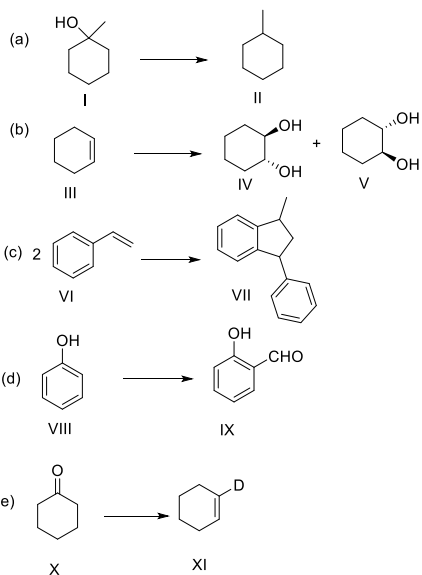
(b) For the following reaction we have observed the following Hammett plot. Explain the reason for observing the non-linear nature. (4)



Q5. Write the proper reagents, conditions and mechanism of the following conversions. (5+5=10)



Q6. Write the reagents and conditions for the following transformations. (5x2=10)



***** END *****