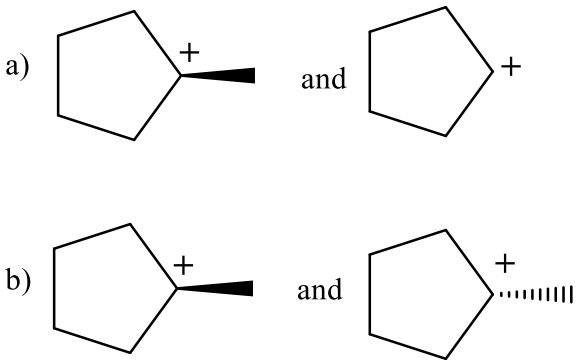
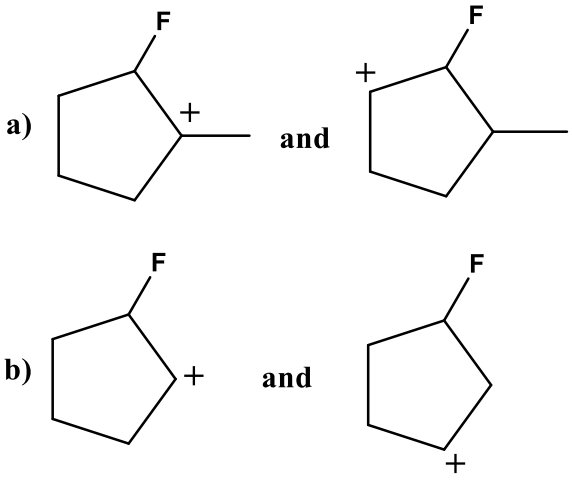
Model Questions from Module-3 (Organic Chemistry)

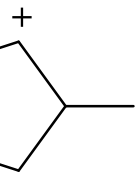
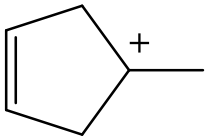
1. How does the steric effect influence the stability of carbocations? Give an example.
2. Compare the stability of the following pairs.

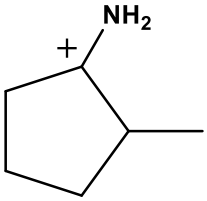
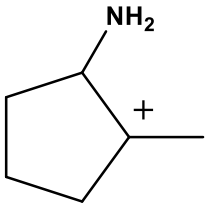


3. Compare the stability of the following pairs.



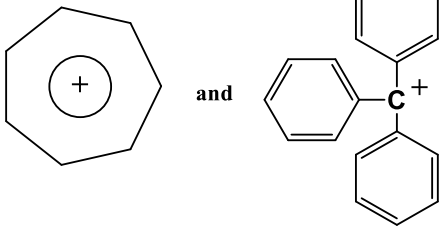
4. ii) Compare the stability of the following pairs.

a)  and 

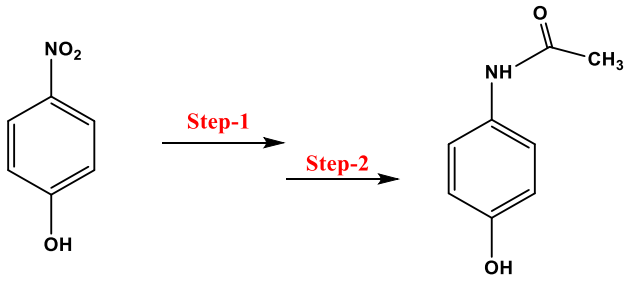
b)  and 

5. Compare and contrast hyperconjugation effects of carbocations and free radicals with suitable examples.
6. Give an account on stabilizing/destabilizing effects of t-butyl group on i) carbocation, ii) carbanion and iii) free radical. Draw required structures.
7. How do the ‘s’ character and resonance influence the stability of carbanions? Explain with suitable examples.
8. How are free radicals different from carbanions in terms of reactivity?
9. How will you convert pyrrole, cyclopentadienyl anion, tropylium ion into non-aromatic? Give equations.
10. Draw the structures of 4, 5 and 6 pi electron systems of cyclopentadienyl species. Which species are the most and least stable? Explain.
11. Differentiate the non-aromatic and anti-aromatic compounds from aromatic compounds with suitable examples.
12. Comment on the following stability order: Aromatic, non-aromatic and anti-aromatic compounds. Justify your answer with suitable examples.

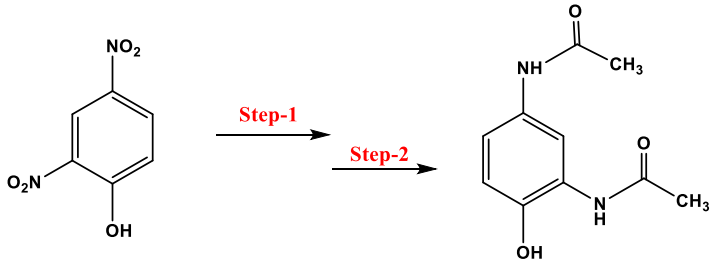
13. “Which one of the following is more stable? Justify.



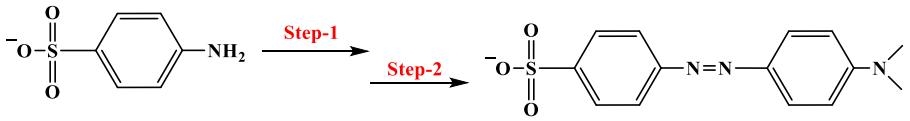
14. Predict the reaction conditions and the appropriate mechanism for the following conversion.



15. Predict the reaction conditions and the appropriate reagents required for the following conversion.



16. Predict the reaction conditions and the appropriate reagents required for the following conversion.



17. Explain the interconversion of leucoindigo to indigo with an appropriate equation and structures.