

**Short Answer Type Questions for B. Sc. (Chem Hons) Semester V  
(Core course - 11 )**

**PART -I**

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1. How does absorption signal originate in PMR spectroscopy.

2. Predict the PMR spectra of

a. Acetaldehyde

b. Benzaldehyde

c. n- Butane

d. Toluene

e. Ethylbromide

f. Ethylalcohol

g. Ethylacetate

h. Acetophenone

i. Tribromoethane

3. How will you distinguish:

a. Propanal & acetone

b. 1,1 – Dibromoethane & 1,2 – dibromoethane

c. Ethylalcohol & ethylbromide

4. Explain the following terms :

a. Spin- spin coupling

b. chemical shift

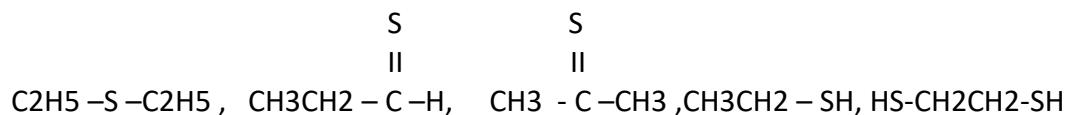
c. coupling constant

d. shielding & deshielding

e. downfield & upfield as in NMR

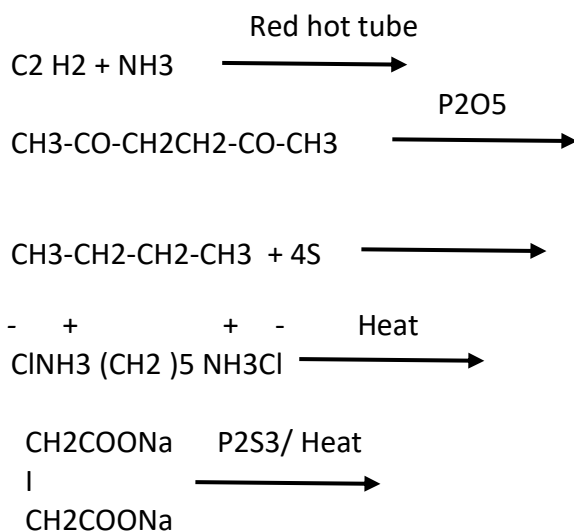
f. spin-spin splitting

5. Explain acetylenic proton is more shielded than vinylic proton.
6. What are the factors affecting chemical shifts.
7. What is organometallic compounds ? Explain by giving examples.
8. What is Grignard reagent ? Draw its structure.
9. Define Reformatsky reaction. Write down its mechanism.
10. Describe the method for the preparation of ethylmagnesium bromide.
11. Write down two differences between organomagnesium & organolithium compound.
12. Write down one method for the preparation of diethylzinc.
13. Draw the structure of thiol, thioether & sulphonic acid.
14. Name the following compounds :



15. Explain thioalcohols are stronger acid than alcohols .
16. Sulphonic acid is a stronger acid. Explain.
17. Write down one method for the synthesis of sulphonamide and sulphaguanidine.
18. Which of the following is stronger acid and why?  
 $\text{C}_6\text{H}_5\text{COOH}$  or  $\text{C}_6\text{H}_5\text{SO}_3\text{H}$ .
19. Draw the molecular orbital diagram of pyrrole and pyridine.
20. Pyrrole is weakly acidic. Explain .
21. What is Chichibabin reaction? Give its mechanism.
22. What is Birch reduction ?
23. Compare the basicity of pyrrole, piperidine and pyridine.
24. Discuss Skraup synthesis of quinoline with mechanism.

25. Electrophilic substitution reaction of pyrrole takes place at which position and why?
26. Discuss the mechanism of Fischer indole synthesis.
27. Why does electrophilic substitution reaction of quinoline take place in the benzene ring rather than the pyridine ring ?
28. Write down the products :



29. Define active methylene compounds with examples.
30. What are acidic and ketonic hydrolysis? Explain by giving example .
31. Explain Claisen condensation with mechanism.
32. Show keto –enol tautomerism in ethylacetoacetate .
33. What is 1,3 – dithiane ? How it is prepared ?
34. How aldehyde and ketone can be synthesized from 1,3 –dithiane.
35. What are enamines ? How it is used for the synthesis of alpha - alkylated ketones.
36. What happens when;
- When alkyl halide is added to dry Mg turning in dry ether.
  - When methylmagnesium iodide is treated with water.
  - when ethyl magnesium iodide is treated with carbon dioxide.

d. When diethylzinc is treated with acid chloride.

e. When phenyllithium is heated with pyridine.

f. Pyrrole is treated with  $\text{SO}_3$  in pyridine.

g. Pyridine is heated with  $\text{KNO}_3$  in  $\text{H}_2\text{SO}_4$ .

37. Starting with malonic ester, how will you synthesize :

a. Valeric acid

b. Isovaleric acid

c. Succinic acid

d. Adipic acid

e. Barbituric acid.

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