



**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**

**M.Sc. DEGREE EXAMINATION – CHEMISTRY**

SECOND SEMESTER – NOVEMBER 2016

**CH 2819 - ORGANIC REACTION MECHANISMS & HETEROCYCLICS**

Date: 08-11-2016  
Time: 01:00-04:00

Dept. No.

Max. : 100 Marks

**Part-A**

*Answer ALL questions.*

**(10 × 2 = 20)**

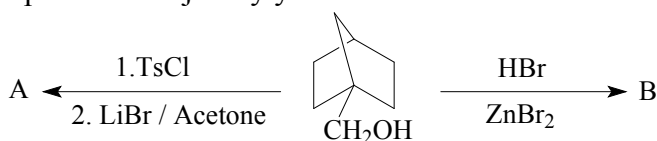
1. Neopentyl halide is very un-reactive towards nucleophilic substitution. Justify?
2. Reactions of *o*- & *m*-dichlorobenzene with  $\text{KNH}_2$  in liq.  $\text{NH}_3$  form identical product. Account.
3. Define isoracemisation process with an example.
4. Predict the product for the reaction of  $\text{CH}_3\text{-Br}$  with a)  $\text{AgCN}$  and b)  $\text{NaCN}$
5. What is Grunwald-Winstein relationship? Mention its significances.
6. How does carbene undergo insertion reaction?
7. What is pyrolytic elimination reaction? Give an example.
8. Why is 1,2-Michael addition preferred in  $\alpha,\beta$ -unsaturated carbonyl compounds?
9. What type of heterocyclic compound is present in phthalocyanine? Draw its structure.
10. Write the synthesis of uric acid.

**Part-B**

*Answer any EIGHT questions.*

**(8 × 5 = 40)**

11. Discuss the effect of solvent in nucleophilic substitution reactions.
12. Predict the product and justify your answer.



13. Explain neighbouring group participation using 2-norbornyl system as an example.
14. a) Discuss the mechanism of Stork–enamine reaction. (3)  
b) What is meant by ipso substitution reaction? Give an example. (2)
15. Discuss various factors affecting the aliphatic electrophilic substitution reaction mechanisms.
16. Which of the following compounds have aromatic character and account for your answer? (a)  $\text{C}_4\text{H}_4^{2+}$   
(b)  $\text{C}_7\text{H}_7^+$  (c)  $\text{C}_8\text{H}_8$
17. Compare E1 and E2 reactions with suitable examples.
18. How is carbene generated? Describe its rearrangement and addition reactions.
19. What is the speciality of addition of ammonia to alkenes? Describe the complete reaction.
20. How is free radical addition reaction different from ionic type? Explain with suitable examples.
21. Describe the general synthesis of (a) pyridine and (b) pyrimidine. (2½ + 2½)
22. How does electrophilic substitution take place in pyrrole? Give examples.

### Part-C

Answer any **FOUR** questions.

(4 × 10 = 40)

23. Explain the following with evidences:

- a) Benzyne mechanism                      b) von Richter rearrangement

24 a. How is amination of 1-butene carried out? What are the products formed?

b. Explain ion-pair mechanism with evidences.

25 a. Diphenylmethyl bromide undergoes solvolysis faster than t-butyl bromide. Justify this statement.

b. Explain the mechanism of Bucherer reaction with evidences.

26 a. Explain E1-E2-E1cB spectrum. (5)

b. Compare the reactivity of alkenes and alkynes towards electrophilic, nucleophilic and free radical reactions. (5)

27 a. How does cycloaddition reaction take place in alkenes? Give suitable examples (4)

b. Explain the synthesis of following compounds.

- (i) uracil                                      (ii) carbazole (3+3)

28. How are the following derivatives of heterocyclic compounds synthesized? (5+5)

- (a) thiamine                                  (b)  $\alpha$ -tocopherol

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