

Time: 3 Hours

## QI. Answer the following multiple choice questions

20M

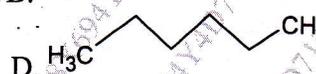
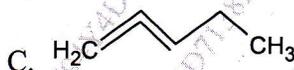
1. Identify the preferred major product for the hydration of 3,3-dimethyl-1-butene in presence of dilute sulphuric acid.

- A. 3,3-dimethyl-2-butanol  
 B. 2,3-dimethyl-1-butanol  
 C. 2,3-dimethyl-2-butanol  
 D. 3,3-dimethyl-1-butanol

2. Which reaction does not involve carbocation intermediate?

- A. E1  
 B. S<sub>N</sub>1  
 C. E2  
 D. Addition of HBr to alkene

3. Which of the following diene is most stable?



4. The antiMarkonikov addition of HBr to alkene takes place due to-----

- A. Concerted mechanism  
 B. Carbanion intermediate  
 C. Carbocation intermediate  
 D. Radical intermediate.

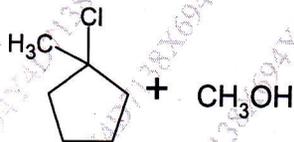
5. Which of the following reagent will lead to synthesis of ethyl chloride from ethanol?

- A. Chlorine in presence of UV light  
 B. HCl  
 C. HCl, ZnCl<sub>2</sub>  
 D. CCl<sub>4</sub>

6. Which of the following alkyl halide is least reactive in an S<sub>N</sub>2 reaction?

- A. CH<sub>3</sub>F  
 B. CH<sub>3</sub>Br  
 C. CH<sub>3</sub>Cl  
 D. CH<sub>3</sub>I

7. Predict the most suitable mechanism of the following reaction.



- A. E1  
 B. E2  
 C. S<sub>N</sub>1  
 D. S<sub>N</sub>2

8. Which nucleophile is required to convert 1-iodobutane butyl ethyl ether?

- A. Butoxide ion  
 B. ethoxide ion  
 C. methoxide ion  
 D. hydroxide ion

9. The benzoin condensation is useful in preparing:

- A.  $\alpha$ -hydroxy ketones
- B.  $\alpha$ -diketones
- C.  $\alpha$ -hydroxy acids
- D.  $\alpha$ -halo ketones

10. Iodoform test is positive for:

- A. Aromatic aldehydes
- B. Formaldehyde
- C. Acetaldehyde and methyl ketones
- D.  $\alpha,\beta$ -unsaturated aldehydes

11. Formation of cyanohydrin from aldehyde is -----type of reaction.

- A. Oxidation
- B. reduction
- C. Nucleophilic addition
- D. Nucleophilic substitution

12. Predict the product for the reaction: Cyclopentanol + Pyridinium chlorochromate

- A. Cyclopentane
- B. Cyclopentanone
- C. Cyclopentanaldehyde
- D. Cyclopentenone

13. Arrange the amines in order of increasing solubility in water: ethylamine, trimethylamine, dimethylamine

- A. Ethylamine < trimethylamine < dimethylamine
- B. Trimethylamine < ethylamine < dimethylamine
- C. Dimethylamine < trimethylamine < ethylamine
- D. Ethylamine < dimethylamine < trimethylamine

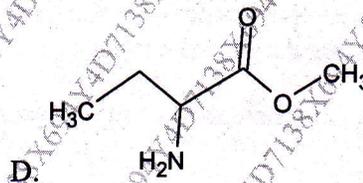
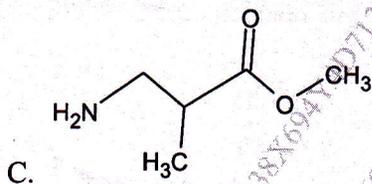
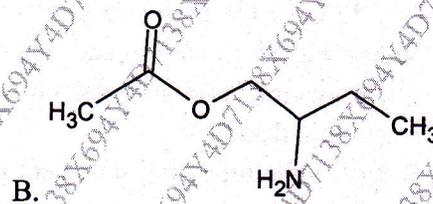
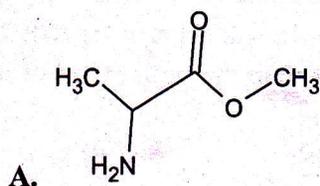
14. Which reagent converts ethyl bromide to ethylamine?

- A.  $\text{NaNO}_2$  and  $\text{HCl}$
- B.  $\text{NaN}_3$ , then catalytic hydrogenation
- C. A large excess of  $\text{NH}_3$
- D.  $\text{NaCN}$ , then  $\text{LiAlH}_4$ , then  $\text{H}_2\text{O}$

15. Conversion of ethyl iodide to butanoic acid is possible by using reagent

- A.  $\text{Mg}$ , anhydrous ether, then  $\text{CO}_2$ , then  $\text{H}_2\text{O}$
- B. Sodium salt of diethylmalonate, then  $\text{H}_2\text{O}$  then  $\text{CO}_2$
- C.  $\text{K}_2\text{Cr}_2\text{O}_7$ ,  $\text{H}_2\text{SO}_4$
- D.  $\text{NaCN}$ , then  $\text{H}_2\text{O}$

16. What is the correct structure of methyl 2-aminobutanoate?



17. Acetic acid and methyl formate exhibit ----- isomerism

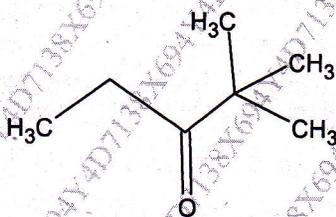
A. Chain

B. Functional

B. Position

D. Metamerism

18. How many tautomers are possible for the following structure?



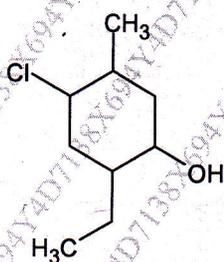
A. 1

B. 2

C. 3

D. 4

19. Identify the correct name for the following structure.



A. 1-chloro-5-ethyl-2-methylcyclohexan-4-ol

B. 4-chloro-2-ethyl-5-methylcyclohexan-1-ol

C. 1-chloro-3-ethyl-6-methylcyclohexan-4-ol

D. 4-chloro-6-ethyl-3-methylcyclohexan-1-ol

20. Valeric acid is the common name for -----

A. Ethanoic acid

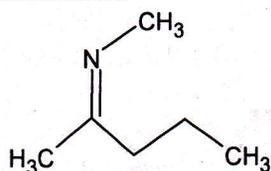
C. Butanoic acid

B. Propanoic acid

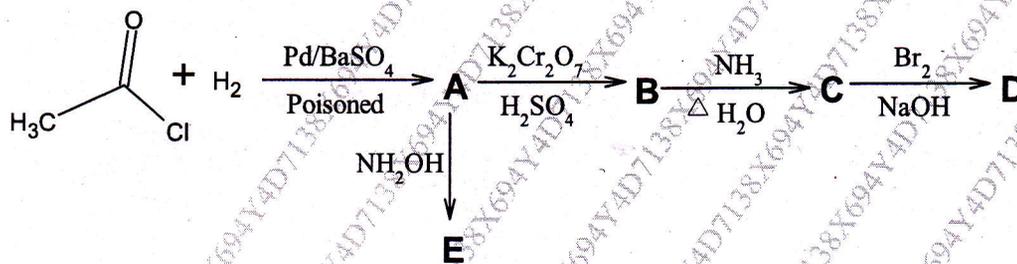
D. Pentanoic acid



- B. Draw the structures of the possible tautomers for the following and identify the type of tautomerism.



- Q3. Complete the following reaction with appropriate product structures.



- Q4. Discuss any two methods of preparation of alkanes. How iodine reacts alkane, explain with reaction.

- Q5. Explain preparation of primary, secondary and tertiary alcohol from the Grignard reagent.

- Q6. Explain in detail qualitative tests: Hinsberg test and Haloform test.

- Q7. Give the name of reagents used in the following reactions.

- Acetaldehyde to 2-propanol
- Acetone to acetone cyanohydrin
- Toluene to benzaldehyde
- Benzaldehyde to Benzoic acid and benzyl alcohol
- Acetone to acetone oxime
- Isopropyl alcohol to acetone

- Q8. Give the reaction and suitable products for the reaction of 2,4 dimethyl pent-2-ene with the reagents: 1. Cold  $\text{KMnO}_4$ , 2. Ozone, Zinc and water. Also specify which type of reaction involved.

- Q9. Differentiate  $\text{S}_{\text{N}}1$  and  $\text{S}_{\text{N}}2$  reactions with respect to their stereochemistry.