

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

IUPAC name of the compound  $\text{CH}_2 = \text{CHCN}$  is

- (a) Ethenenitrile (b) Vinyl cyanide  
(c) Cyanoethene (d) 2-Propene nitrile

Weakest acid among the following is

- (a)  $\text{CH}_3\text{COOH}$  (b)  $\text{CH}_2\text{ClCOOH}$   
(c)  $\text{CHCl}_2\text{COOH}$  (d)  $\text{CCl}_3\text{COOH}$

Which of the following compounds is used as an antiknock compound?

- (a) Ethyl lithium (b) Tetraethyl lead  
(c) Ethyl acetate (d) Lead acetate

Conformational isomerism is due to

- (a) rotation about a single bond  
(b) structural changes  
(c) restricted rotation about a double bond  
(d) change in direction of light

The most stable conformation of cyclohexane is the

- (a) Haworth form (b) Boat form  
(c) Chair form (d) Newman form

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

- (a) Write a structural formula of the following compounds

- (i) 2-Methyl pent-2-en-1-ol  
(ii) Ethyl ethanoate  
(iii) 4-Cyano-3-methoxy butanoic acid  
(iv) 4-Amino-2-ethyl-2-pentenal  
(v) 3, 5-Octadiene

Or

- (b) Describe the Inductive effect with suitable examples.

3.  $\text{SN}^2$  mechanism proceeds through the formation of  
(a) Free radical (b) Carbonium ion  
(c) Carbanion (d) Transition state
4. Which of the following is an example of elimination reaction  
(a) Chlorination of methane  
(b) Dehydration of ethanol  
(c) Nitration of benzene  
(d) Hydroxylation of ethylene
5. The Hell-Volhard-Zelinsky reaction is specific for  
(a) Replacement of beta hydrogen  
(b) Replacement of alpha hydrogen  
(c) Replacement of beta carbon  
(d) Replacement of alpha carbon
6. In succinic acid,  $\text{HOOC}(\text{CH}_2)_n\text{COOH}$ ,  $n$  is equal to  
(a) 2 (b) 1  
(c) 3 (d) 4
7. Which of the following compounds will react with methyl magnesium iodide followed by acid hydrolysis to give ethyl alcohol?  
(a) Ethylene (b) Acetaldehyde  
(c) Formaldehyde (d) Acetone

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12. (a) Write a note on Diels-Alder reaction.

Or

- (b) State and explain Saytzeff's rule with an example.

13. (a) Write the reaction mechanism of addition of carbonyl compounds with HCN.

Or

- (b) Explain Meerwein Ponndorf-Verley reduction reaction.

14. (a) Write a note on Reformatsky reaction with example.

Or

- (b) Explain synthesis and applications of Saccharin.

15. (a) What is Bayer's strain theory? Illustrate with suitable example.

Or

- (b) Write a note on (i) Dihedral angle (ii) Torsional strain.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Explain resonance effect and repetition with example.

Or

- (b) Describe the formation and stability of carbenes and nitrenes.

17. (a) Explain the preparation, properties and uses of vinyl chloride.

Or

- (b) Discuss the effect of substrate, solvent, nucleophile and leaving group in  $S_N^1$  reactions.

18. (a) Discuss the following reactions : (i) Aldol condensation (ii) Wittig reaction

Or

- (b) Describe the preparation and properties of Succinic acid.

19. (a) (i) Explain the preparation and properties of methyl lithium.

(ii) Write a note on preparation and properties of benzene sulphonic acid.

Or

- (b) What are Grignard reagents? Explain their preparation and properties.

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20. (a) Explain the conformational analysis of n-butane with energy diagram.

Or

- (b) Describe the preparation and synthetic uses of ethyl acetoacetate.
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