

Exam. Code : 103201

Subject Code : 1256

B.A./B.Sc. 1st Semester (Batch 2021-24)

CHEMISTRY (Organic Chemistry—I)

Time Allowed—3 Hours] [Maximum Marks—35

Note :— Attempt *five* questions in all, selecting at least *one* question from each section. The *fifth* question may be attempted from any section. All questions carry equal marks.

SECTION—A

- (a) An aqueous solution of tropyllium bromide on treatment with AgNO_3 gives precipitate of AgBr . Explain. 4

(b) Why isopropyl free radical is more stable than n-propyl radical ? 3
- (a) Arrange the following free radicals in order of their increasing stability and justify :
 $\dot{\text{C}}\text{H}_3$, $(\text{CH}_3)_3\dot{\text{C}}$, $(\text{CH}_3)_2\dot{\text{C}}\text{H}$, $\text{C}_6\text{H}_5\dot{\text{C}}\text{H}_2$. 4

(b) How do you explain the o, p-directing nature of $-\text{CH}_3$ group, though it lacks electron pair ? 3

SECTION—B

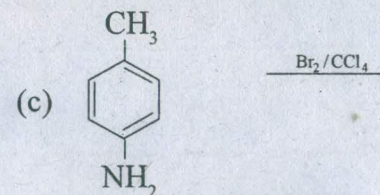
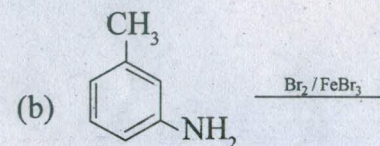
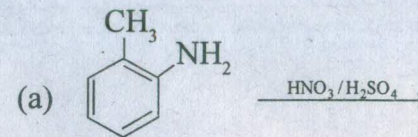
3. (a) Using 1-methylcyclohexene as an example, discuss its ozonolysis with suitable mechanism. 5
- (b) Acetylene forms metal acetylide but dimethylacetylene does not form such derivatives, why? 2
4. (a) Chlorination of n-butane in the presence of light gives a mixture of 72% of 2-chlorobutane and 28% of 1-chlorobutane while bromination gives 98% of 2-bromobutane and 2% of 1-bromobutane, explain. 5
- (b) Sketch the mechanism of epoxidation reaction. 2

SECTION—C

5. (a) Draw energy profile diagram for S_N1 and S_N2 reactions. 4
- (b) 1-chlorobut-2-ene reacts with KCN to give a mixture of isomeric products. Give the structures and suitable mechanisms for the isomeric products. 3
6. Discuss Baeyer's strain theory. How it is used to explain the reactivity of cyclopropane and cyclobutane rings? Also discuss its limitations. 7

SECTION—D

7. Predict the product/products in the following reactions :



3+2+2

8. (a) Why does side-chain halogenation in alkyl benzene take place preferentially at α -position to the aromatic ring? 4
- (b) Explain what are anti-aromatic compounds. Give two examples. 3