This question paper contains **2** printed pages]

SB—15—2022

FACULTY OF SCIENCE

B.Sc. (First Year) (Second Semester) EXAMINATION

MAY/JUNE, 2022

(New Course)

CHEMISTRY

Paper–III

(Organic and Inorganic Chemistry)

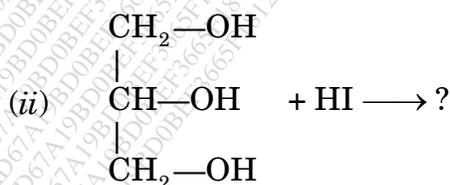**(Wednesday, 8-6-2022)**   **Time : 10.00 a.m. to 12.30 p.m.**
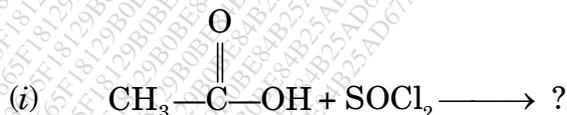
Time— 2½ *Hours*   *Maximum Marks*—40
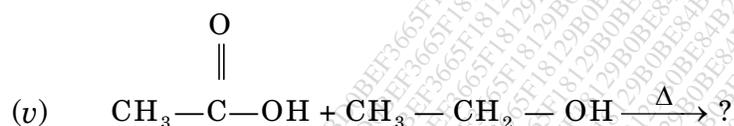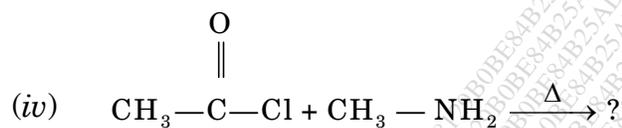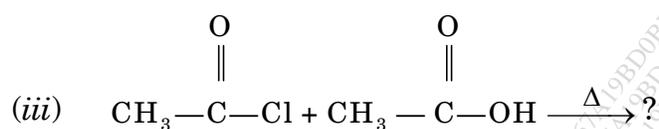
(Inorganic Chemistry)

1. Solve any *three* of the following :   3×5=15

    (1) Explain the diagonal relationship between Boron and Silicon.

    (2) Explain variation in Ionization energy in '*p*'-block elements.

    (3) Define acids and bases with Lewis concept and discuss briefly with suitable examples.

    (4) Define Hard and Soft and borderline acids and bases with suitable examples.

    (5) What is SHAB principle ? Give the limitation of SHAB.

(Organic Chemistry)

2. Attempt any *three* of the the following :   3×5=15

    (1) Predict the product of the following :

    (*i*) $\underset{\text{CH}_3-\overset{\displaystyle O}{\overset{\|}{C}}-\text{OH}}{} + \text{SOCl}_2 \longrightarrow$?

    (*ii*) $\underset{\overset{\displaystyle \text{CH}_2-\text{OH}}{\underset{\displaystyle \text{CH}_2-\text{OH}}{|\ \text{CH}-\text{OH}\ |}}}{} + \text{HI} \longrightarrow$?

P.T.O.

$$\text{(iii)} \quad CH_3 \overset{\overset{\displaystyle O}{\|}}{-}C-Cl + CH_3 \overset{\overset{\displaystyle O}{\|}}{-}C-OH \xrightarrow{\Delta} ?$$

$$\text{(iv)} \quad CH_3 \overset{\overset{\displaystyle O}{\|}}{-}C-Cl + CH_3 - NH_2 \xrightarrow{\Delta} ?$$

$$\text{(v)} \quad CH_3 \overset{\overset{\displaystyle O}{\|}}{-}C-OH + CH_3 - CH_2 - OH \xrightarrow{\Delta} ?$$

(2) Explain the Friedel-Craft reaction with suitable mechanism.

(3) What is the action of the following reagents on allyl iodide ?

(i) NaOH;

(ii) KCN;

(iii) Br_2.

(4) How will you prepare Glycerol from ?

(i) Oil and Fats;

(ii) Propene.

(5) How will you prepare nitrobenzene from benzene ? Explain with mechanism.

3. Attempt any *two* of the following : 2×5=10

(1) Discuss the effect of —OH group on aromatic electrophilic substitution of Benzene.

(2) How will you prepare Benaldehyde by Gattermann reaction ? Explain with mechanism.

(3) Write Reimer-Tiemann reaction with suitable mechanism.

(4) Discuss the mechanism of ring opening of epoxide in acidic and basic condition.