This question paper contains **4** printed pages]

ST—171—2022

FACULTY OF SCIENCE

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

MAY/JUNE, 2022

(CBCS/New Pattern)

CHEMISTRY

Paper-II (CH-422)

Organic Chemistry

(Friday, 1-7-2022) **Time : 9.30 a.m. to 1.15 p.m.**

Time— 3.45 *Hours* *Maximum Marks*—75

N.B. :— (*i*) Attempt *all* questions.

(*ii*) Figures to the right indicate full marks.

(*iii*) Use of logarithmic table and non-programmable calculator is allowed.

1. Attempt any *three* of the following : 15

(*a*) Explain the arenium ion mechanism with the help of suitable example.

(*b*) Discuss the photochemistry of vision.

(*c*) Give the synthesis and applications of organolithium compound.

(*d*) What are the sigmatropic rearrangement ? Explain 1, 5 sigmatropic rearrangement with suitable example.

(*e*) Explain photochemistry of α-β unsaturated ketone.

2. Attempt any *three* of the following : 15

(*a*) Discuss cycloaddition reaction between ethylene and 1, 3 butadiene by FMO-method.

(*b*) Explain : Effect of substrate, leaving group and solvent polarity on Aliphatic electrophilic substitution reaction.

P.T.O.

(*c*) What is the action of $NaBH_4$ on saturated carbonyl compound ? Explain with the help of suitable example and mechanism.

(*d*) Explain photofries reaction of anillides.

(*e*) Explain with mechanism :

(*i*) Vilsmeir reaction

(*ii*) Michael reaction.

3. (*a*) Comment on the following : 7

(*i*) Jablonski diagram

(*ii*) Paterno-Buchi reaction.

Or

Explain interconversion of 1, 3, 5 Hexatriene 1, 3 cyclohexadiene under thermal and photochemical condition by FMO & correlation diagram method.

(*b*) Comment on the following : 8

(*i*) Gatterman-Koch reaction

(*ii*) Benzoin condensation reaction.

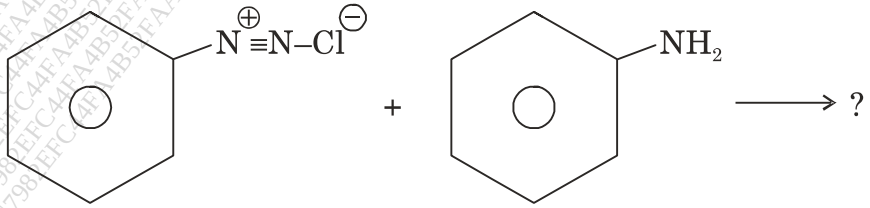
4. (*a*) What are Norrish type-I and II reaction ? Explain its mechanism with suitable examples. 7

Or

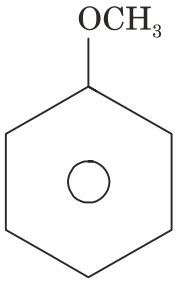
Explain 1, 3 dipolar cycloaddition reaction and chelotropic reaction with suitable examples and SE^2 reaction mechanism.

(*b*) Predict the product with appropriate mechanism of the following (any *four*) : 8

(*i*)

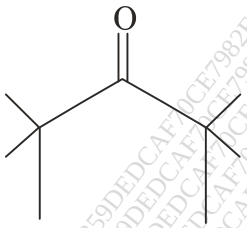


(*ii*)



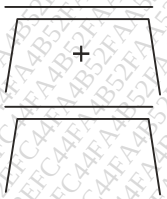
+ C_6H_5—N(CH$_3$)—C(=O)—H $\xrightarrow{POCl_3}$?

(*iii*)



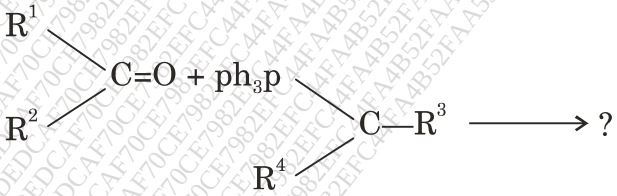
$\xrightarrow[3/3hm]{\lambda v}$?

(*iv*)



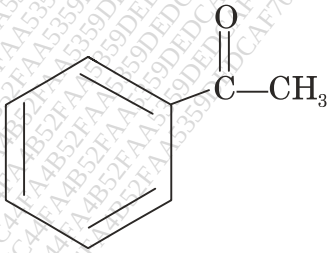
$\xrightarrow[\text{FMO method}]{\Delta \,\&\, hv}$?

(*v*)



$\longrightarrow$?

(*vi*)

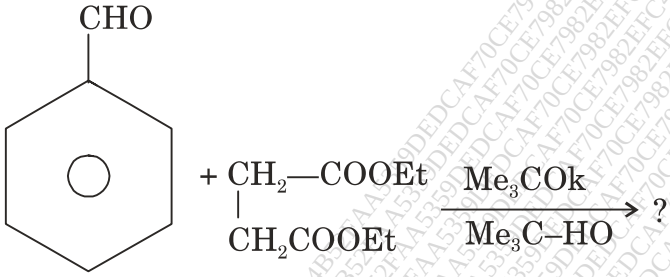


$\xrightarrow[h - \pi^*]{\lambda v}$?

Me_2CHOH

P.T.O.

(*vii*)



5. Write short notes on any *three* of the following : 15

(*a*) Addition to cyclopropane ring

(*b*) Aza Cope rearrangement

(*c*) Perkin & Stoppe reaction

(*d*) Photo-degradation of polymers.