[Time :3 Hours] **[Marks:100]**

NB:-

1. Please check whether you have received the right question paper
2. All questions are Compulsory
3. Figures to the right indicates full marks
4. Use of logtables/non-programmable calculator is permitted

Q.1 Answer **any four** questions out of the following**.**

A a) Discuss the $B_{AC}2$ mechanism of hydrolysis of esters **3**

b) Distinguish between electrophiles and nucleophiles. **2**

B a) Discuss the stereochemistry of NGP with a suitable example **3**

b) Complete the following reaction and name the reaction involved: **2**

C a) Explain with mechanism cope reaction. **3**

b) Explain cheletropic reaction with suitable example. **2**

D a) What are electrocyclic and sigmatropic reactions? Explain with examples. **3**

b) Complete the following and name the reaction: **2**

Butadiene + acrylonitrile ----heat-----→ ?

E With the help of a neat and labelled Jablonski diagram explain different physical processes associated with excited molecules. **5**

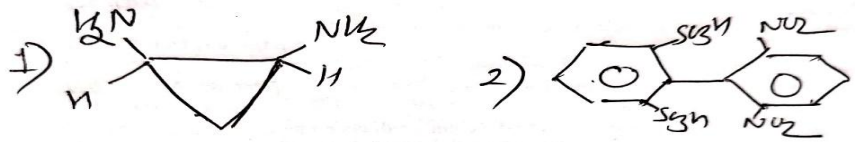
F a) Explain Norrish type I reaction at room temperature. **3**

b) Distinguish between thermal and photochemical reactions. **2**

Q.2 Answer **any four** questions out of the following:

A Write a note on the stereochemistry of biphenyls. **5**

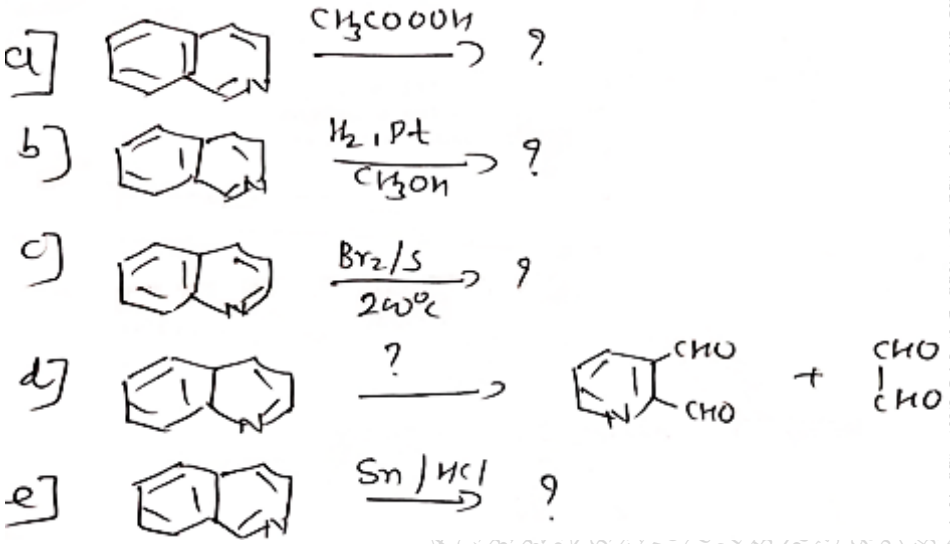
B a) State whether the following compounds are optically active or optically inactive. Justify your answer. **3**



b) Define plane of symmetry with an example. **2**

C Give the Skraup synthesis for the preparation of quinoline. Write the reaction of quinoline with nitrating mixture. **5**

D Complete the following reactions. **5**



E a)What are the disadvantages of agrochemicals? **3**

b) Draw the resonating structures of Pyridine-N-oxide. **2**

F What are Agrochemicals? Give two advantages of it. Write the synthesis of indole 3 acetic acid with their application. **5**

Q.3 Answer **any four** of the following :

A Explain Chemoselectivity with two suitable examples. **5**

B Define Convergent synthesis. Give one example of convergent synthesis. **5**

C a) Calculate the % atom economy for the following reaction: **3**

$C_6H_5\text{-}CH{=}CH_2 + H_2O_2 \longrightarrow C_6H_5\text{-}CH(O)CH_2 + H_2O$

b) Give the advantages of bio-catalysts **2**

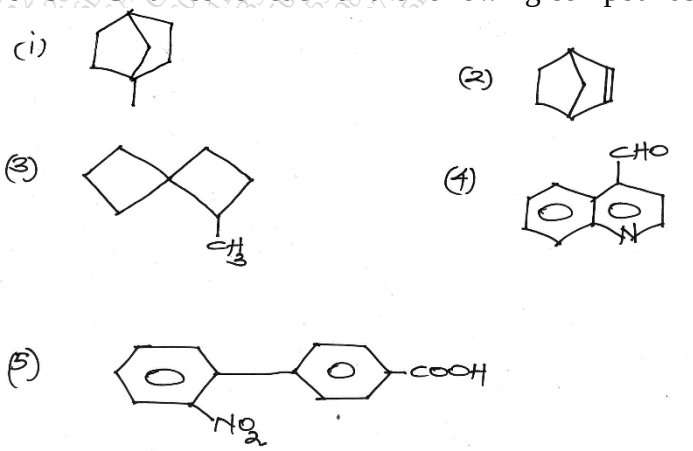
D Give the synthesis of the following from a suitable starting compound: **5**

1) p-bromobenzoic acid
2) 1-phenyl ethanol using a suitable Grignard reagent.

E Write the structural formula for each of the following compounds: **5**

1) Quinoline-5-carboxaldehyde
2) Bicyclo[2.2.1] hepta-2,5-diene
3) Spiro[2.5] octane
4) 2, 3′-dimethyl diphenyl
5) 1,3-dichloro-1,2-butadiene

F Give IUPAC names for each of the following compounds. **5**



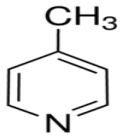
Q.4 Answer **any four** of the following :

A Explain the following terms used in spectroscopy with suitable example: **5**
1) Auxochrome
2) Bathochromic shift

B Explain the fragmentation of the following molecules: **5**
1) Ethyl methyl ketone
2) 2-methyl pentane

C Give analytical evidence to prove the following:
1) Citral is an acyclic monoterpenoid **5**
2) Nicotine has N-methyl pyrrolidine ring.

D Give the reactions for Hofmann Exhaustive Methylation and degradation of: **5**



E Give the synthesis of Nicotine from nicotinic acid. **5**

F a) Give Ott's synthesis of adrenaline **3**
b) State isoprene rule. **2**

Q.5 A Select the correct answer and fill in the blanks **(any Five)** **5**

a) Cope elimination is observed in _____
i) N-substituted amide ii) aromatic ketoxime iii) tertiary amine oxides

b) All nucleophiles are _____
i) Lewis acid ii) Lewis base iii) neutral

c)1,3,5-Hexatriene undergoes electrocyclic reaction to form _____
i)1,3-Cyclohexadiene ii) cyclohexene iii) 1,4-Cyclohexadiene

d) In NGP the stereochemistry of product is_____
i) changed ii) retained iii) inverted

e)_____ is a thermodynamic term.
i)electrophilicity ii) nucleophilicity iii) basicity

f) Homolytic fission of covalent bond results into formation of _____
i) carbocation ii) free radical iii) carbanion

g) Norrish Type-I reaction occurs in
i) Ethane ii)Dimethyl ketone iii) benzene

h) Benzophenone reacts with isopropyl alcohol in presence of light to form benzpinacol is an example of _____reaction
i)photoreduction ii) photooxidation iii) photosensitization

B State whether the following are True or False **(any Five)** **5**
a) Trans-1,2-Dichloro cyclopropane is optically active.
b)Trans-1,3-Dimethyl cyclobutane is achiral
c) In quinoline electrophilic substitution takes place at 2 postion .
d) Methanol is reactant used for the Skraup synthesis of quinoline.
e) The dipole moment of pyridine N-Oxide is more than pyridine.

f) DDT and BHC belong to the class of Insecticides
g) Fungistatics kill the fungi.

Q.5 C State true or false. **(Attempt any Five)** **5**

a) Reactions with higher E-factor are more desirable
b) Carbon tetrachloride is an example of green solvent
c) A synthesis in which the product is obtained through a series of single step reactions is called convergent synthesis
d) Biginelli reaction is an example of multi component synthesis
e) Atom economy is higher when by-products are not formed in any chemical reaction.
f) Molecular formula of biphenyl is $(C_6H_5)_2$
g) In spiro compounds the two rings are attached such that one carbon atom is common to both the rings.
h) Quinoline is benzo[c] pyridine.

Q.5 D **Match the columns (Attempt any Five)** **5**

Column A	**Column B**
(a) Adrenaline	1. -OH group
(b) Citral-b	2. Tobacco leaves
(c) Nicotine	3. Neral
(d) Isoprene	4. Hyperchromic effect
(e) Protein hormone	5. Epinephrine
(f) Increase in intensity of absorption	6. 2-methyl butadiene
(g) Auxochrome	7. Insulin

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