19/11/15

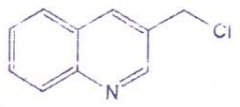
Sem-V (CBSGS) Organic Chemistry-II

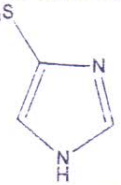
QP Code : 21766

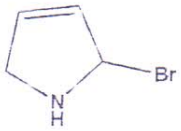
Time: 3hrs **Total Marks: 70**

N.B.: 1. All Questions are compulsory
2. Figures to right indicate full marks

Q1. A. Give the IUPAC nomenclature of the following compounds (03)

i) 

ii) 

iii) 

B. Define following terms: (i) Dis rotatory motion (ii) Synthon equivalent (iii) Sterol (iv) E-factor (04)
C. Enlist the non green components involved in nitration of benzene (01)
D. Draw the chair conformation of 5β-pregnane (01)
E. Write the reaction for esterification of 3β,6β-dihydroxy-5α-cholestane (02)
F. Write strategy for disconnection of thiophene. (01)
G. Give the reaction for catalytic amino acid ester synthesis (01)
H. Justify the statement: Pyridine undergoes electrophilic substitution at position 3 or 5 (02)

Q2. A. Explain the mechanism for the following (Any 2) (04)
(i) Skraup synthesis and (ii) Fischer Indole synthesis (iii) Pictet Gams synthesis
B. Explain the stereochemical reaction of 1,3-butadiene with stereoisomers of diethyl maleate. (03)
C. Complete the reaction: cis-2-butene $\xrightarrow{h\nu}$ (01)
D. Explain catalytic C-C bond formation reaction for naproxen (02)
E. Write a zeolite based MPV reduction reaction (01)

Q3. A. Give mechanism for the following reactions (**any four**): (04)
i) Pyridine to 2-hydroxypyridine ii) Isoquinoline to 1-aminoisoquinoline
iii) Indole to 3- dimethylaminomethylindole iv) 2-bromothiophene to thiophene-2-carboxylic acid
v) 4-methylpyrimidine to 4-methylpyrimidine-N-oxide
B. Design the retrosynthetic scheme and synthesis for Ibuprofen (04)
C. Explain the classical and catalytic route for hydroquinone synthesis (03)

Q4. A. Complete the following reactions (Any 8) (08)

i) **Furan** $\xrightarrow[-5^\circ C]{Br_2, \text{ dioxane}}$

ii) **Pyridine** $\xrightarrow[230^\circ C]{H_2SO_4, HgSO_4}$

iii) **Thiophene** $\xrightarrow{POCl_3, DMF}$

iv) **Pyrimidine** $\xrightarrow[130^\circ C]{NH_2\text{-}NH_2}$

v) **Indole + Formaldehyde + Dimethylamine** $\xrightarrow{base}$

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Q.4. A.

vi) Pyrrole $\xrightarrow[CH_3COOH]{(CH_3CO)_2O}$

vii) Imidazole $\xrightarrow[Base]{I_2}$

viii) Quinoline $\xrightarrow[0^\circ C]{HNO_3, H_2SO_4}$

ix) Isoquinoline $\xrightarrow{NaNH_2, liq.NH_3}$

B. Depict the bonding, antibonding molecular orbitals and HOMO and LUMO for Ground State and Excited State in LCAO of 1,3,5-hexatriene (03)

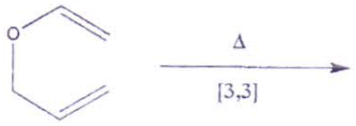
Q5.A. Write complete mechanism for **any two** : (i) Radiszewskii synthesis. (ii) Knorr pyrrole synthesis (iii).Conrad Limpach synthesis (04)

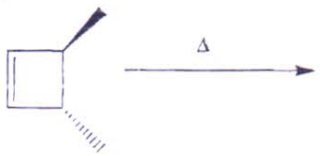
B. Give reasonable explanation for the following (**any Seven**): (07)

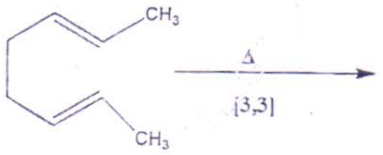
i) Electrophilic substitution in furan occurs at position 2 and 5
ii) Thiophene does not undergo Diel's Alder reaction
iii) Pyridine undergoes nucleophilic substitution at C-2 and C-4
iv) Electrophilic substitution in isoquinoline takes place at 5- and 8- position
v) Protonation of N atom present in pyrrole is difficult than that in pyridine
vi) Hoffmann degradation of 3α-trimethylammonium-5α-cholestane forms 5α-cholest-2-ene.
vii) Acetates of 5β-cholestan-3α-ol get hydrolyzed more rapidly than 5β-cholestan-3β-ol.
viii) Cholesterol on oxidation with H_2O_2 gives a trans product.

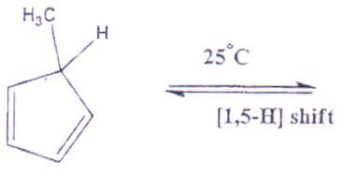
Q.6.A. Draw suitable resonating structures for (i) Pyridine (ii) Imidazole iii) Furan iv) Indole (04)

B. Complete the following reactions (04)

i) 

iii) 

ii) 

iv) 

D. Discuss retrosynthetic analysis and synthetic pathway for p-hydroxyacetanilide (03)
