B.Pharm/Sem-V CBSGS RT 18/4/16

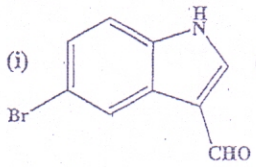
O.C- III

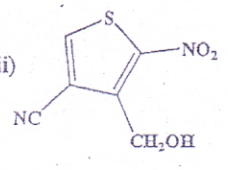
QP Code : 24947

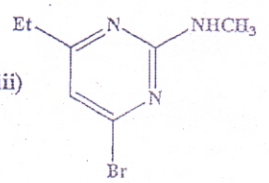
Time: 3hrs

N.B.: 1. All Questions are compulsory. Total Marks: 70
2. Figures to right indicate full marks.

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

(i) 

(ii) 

(iii) 

B. Justify-Furan,pyrrole and thiophene are heteroaromatics (02)
C. Answer the following: (05)
(i) Give structural requirements for (4+2) cycloaddition reactants.
(ii) Write strategy for disconnection of furan.
(iii) Give synthetic equivalent for the synthon $HC\equiv C^{\ominus}$
(iv) Give structure of product formed when bromine adds to Cholesterol
(v) Atom efficiency with example.
D. Give structures of the following: (i) Estrogen. (ii) 17α,11,21-trihydroxy-4-pregnene-3,20-dione. (iii) 5β-cholestane-3β,6β-diol (in chair form). (03)
E. Give reactions of Friedel craft acylation using conventional and green reagents. (02)

Q2. A. Write complete mechanism for (any two) (04)
(i) Fiest-Benary synthesis (ii) Madelung synthesis iii) Bischler Napieralski synthesis
B. Discuss green chemistry routes for MPV reduction with examples. (03)
C. (i) Explain with molecular orbital pictures why thermal [1,3] sigmatropic reaction is symmetry forbidden. (03)
(ii) Complete the following reaction: (01)

Q3. A. Attempt the following conversions (any four): (04)
(i) Phenylacetylbromide to 2,4-diphenylimidazole.
(ii) 4-methylpyrimidine to 4-methylpyrimidine-N-oxide.
(iii) Pyrrole to 3-chloropyridine.
(iv) 2-phenylethylamine to 2-methylisoquinoline.
(v) Pyrrole to 2,3,4,5-tetrabromopyrrole.
B. Using synthon approach devise scheme for synthesis of atenolol. (04)
C. Enlist merits of biocatalysis in relation to green chemistry. Give the enzymatic process for synthesis of aspartame. (03)

Q4. A. Write structures of products formed for the following reactions: (03)

(i) 2E, 4Z, 6E-octatriene $\xrightarrow{\Delta}$ _____

(ii) cis-3, 4-dimethyl cyclobutene $\xrightarrow{\Delta}$

(iii) 1, 3-cyclopentadiene + Maleic anhydride $\xrightarrow{\Delta}$

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Q4. B. Write structures of products formed for the following reactions (any eight): (08)

(i) 4-bromopyridine $\xrightarrow{NaNH_2,\ liq.\ NH_3}$

(ii) 3-methoxyaniline + Glycerol $\xrightarrow{conc.\ H_2SO_4,\ Nitrobenzene}$

(iii) Isoquinoline $\xrightarrow{conc.\ H_2SO_4,\ 220^oC}$

(iv) Indole $\xrightarrow{C_2H_5NO_2,\ C_2H_5ONa}$

(v) Thiophene $\xrightarrow{Cl_2,\ -30^oC}$

(vi) Furan $\xrightarrow{Ac_2O,\ BF_3,\ ether,\ 0^oC}$

(vii) Pyrrole $\xrightarrow{CO_2,\ CHCl_3,\ \Delta}$

(viii) Imidazole $\xrightarrow{Br_2;\ CHCl_3,\ -10^oC}$

(ix) Quinoline $\xrightarrow{KMnO_4}$

Q5. A. Write complete mechanism for any two: (i) Friedländer synthesis. (ii) Knorr pyrrole synthesis (iii) Hantzsch synthesis of Pyridine (04)

B. Give reasonable explanation for the following: (05)

(i) Hoffmann degradation of 3β-trimethylammonium-5β-cholestane does not form any product.

(ii) Furan undergoes Diels-Alder reaction while thiophene does not.

(iii) Oxidation of 5α-cholestane-11β-ol is highest.

(iv) Electrophilic substitution in quinoline takes place at 5- and 8- position.

(v) Nucleophilic substitution in pyridine is preferred at 2-position.

C. Attempt the following conversions: (02)

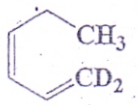
(i) 5α-cholestan-3β-ol to 5α-cholestane.

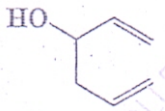
(ii) Cholest-5-en-3β-ol to cholestane-3β,5α,6β-triol.

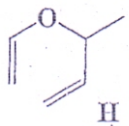
Q6. A. Draw resonating structures of: (i) Thiophene (ii) Isoquinoline (iii) Pyrimidine (03)

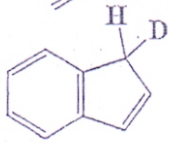
B. Justify the statement 'Pyrrole is a weak acid.' (01)

C. Complete the following reactions: (04)

(i)  $\xrightarrow{[1,5]\text{-}H,\ \Delta}$

(ii)  $\xrightarrow{[3,3],\ \Delta}$

(iii)  $\xrightarrow{[3,3],\ \Delta}$

(iv)  $\xrightarrow{[1,5]\text{-}D,\ \Delta}$

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