Total No. of Questions : 6]

SEAT No. : ____

PA-3239

[Total No. of Pages : 6

[5911]-31
M.Sc. - II
DRUG CHEMISTRY
CHD - 360 : Advanced Analytical Methods
(2019 Pattern) (Semester - III)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

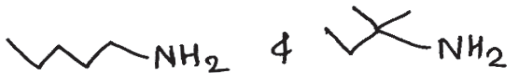
1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Answer to the two sections should be written in separate answer books.***

SECTION - I

Q1) a) **Answer the following : (any four)** **[8]**

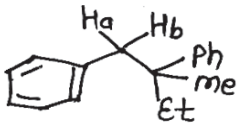
i) Why $CDCl_3$ gives triplet in ^{13}C NMR.

ii) How will you distinguish between following pairs by indicated spectral method?



^{13}C NMR

iii) The J values for the compounds are as shown below explain.



$J_{HaHb} = 14\ Hz$

$J_{HaHb} = 4.8\ Hz$

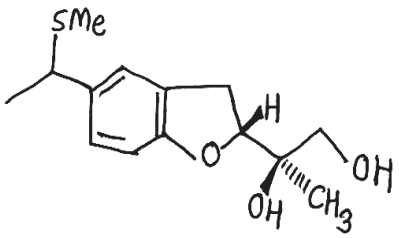
iv) The ^1H NMR spectrum of monofluoro acetone shows a doublet for methyl protons with J = 4.3Hz, Explain.

v) The compound with a molecular formula C_6H_8 shows only two signals in ^{13}C NMR. DEPT shows presence of CH & CH_2 assign probable structure.

b) A compound shows $M^{\overset{+}{\circ}}$ at 84 and has a base peak at 56, what is its probable Molecular Formula? It exhibits only one signal in its PMR & CMR at 1.4 and 35 respectively. No significant peak is observed in IR spectrum. Deduce its structure. **[3]**

P.T.O.

Q2) a) Assign the chemical shift to the various protons in the following structure. Explain your assignments. **[6]**



1.48 (S, 3H); 1.52 (d, J = 7.5 Hz, 3H);
1.88 (S,3H); 3.2 (d, J = 9 Hz, 2H);
3.75 (q, J = 7.5 Hz, 1H);
3.88 (d, J = 10 Hz, 1H);
4.05 (d, J = 10 Hz, 1H);
5.18 (t, J = 9 Hz, 1H);
6.65 (d, J = 8 Hz, 1H);
7.02 (dd, J = 8 & 2 Hz, 1H);
7.10 (d, J = 2 Hz, 1H).

Note : – OH proton signal not given.

b) Write short note on any two of the following : **[6]**

i) Factor affecting vicinal coupling constant.

ii) HETCOR in structure determination.

iii) DEPT technique.

Q3) a) Deduce the structure of the molecule by analysing the given spectral data (any two) **[6]**

i) MF : $C_9H_{16}O$
IR : 1680, 1635 cm^{-1}
PMR : 0.9 (d, 7Hz, 6H); 1.0(t, 7Hz 3H); 1.77 (m, 1H);
2.09 (t, 7Hz, 2H); 2.49 (q, 7Hz 2H); 5.1 (d, 16Hz 1H);
6.71 (dt, 16 & 7Hz, 1H)

ii) MF : $C_{10}H_{16}O$
IR : 1690, 1620 cm^{-1}
PMR : 1.2 (s) 6H; 1.9 (d, 1.5Hz, 3H); 2.1(s,3H);
4.9 (dd, 1.5 & 10 Hz, 1H); 5.1 (dd, 1.5 & 16Hz 1H);
5.2 (dd, 10 & 16 Hz, 1H); 5.4 (q, 1.5 Hz, 1H)

iii) MF : C_7H_9N

IR : 2250 cm^{-1}

PMR : 1.9 (m, 2H), 2.35 (m, 4H), 3.10 (S, 2H) 5.75 (t, 1H)

CMR : 19(t), 23(t), 32(t), 34(t), 117(s), 129(d), 132(s).

b) Answer any two of the following : **[6]**

i) A compound with M.F. $C_{10}H_{12}O_2$ shows the following spectral data. Analyse data and arrive at a structure consistant with data.

CMR : 146, 144, 137, 132, 121.2, 115.5, 114, 111, 56, 40

PMR : 3.3 (dt, 7Hz, 2H); 3.87 (s, 3H); 4.52(bs, exch; 1H); 5.03 (ddt, 17.2 & 1.5 Hz, 1H); 5.15 (ddt, 9.7 & 1.5Hz, 1H); 5.95 (ddt, 17.2, 7.0 & 9.7 Hz, 1H); 6.61 (dd, 8&2Hz 1H); 6.68 (d, 2Hz, 1H); 6.85 (d, 8Hz, 1H)

NOE Irradiation at 6.68 $\rightarrow$ 3.32 & 3.87 line intensity increases.

ii) Deduce the structure from the spectral data given below

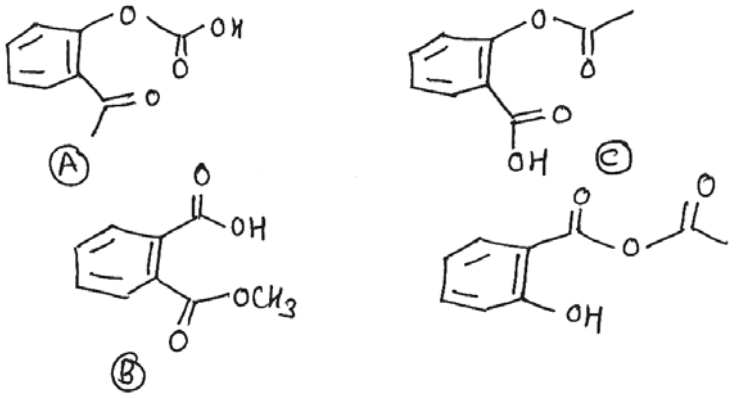
M.F. $C_7H_{14}O_2$

Mass m/e = 130, 115, 98, 73, 43

CMR : δ 208(s), 75(s), 54(t), 50(q), 33(q) 25 (q, str.)

iii) Use the ^{13}C chemical shifts listed below to choose between the following isomeric structural posibilities.

CMR : 170(s), 168.9(s), 165.6(s), 150.4(s), 133.1(d) 131.4(d), 124.1(d), 123.5(d), 20.8(q)



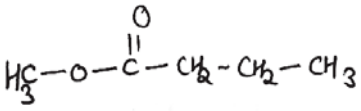
SECTION - II

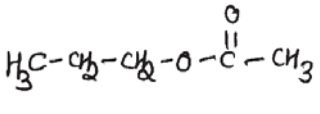
Q4) a) Answer any four of the following : **[8]**

i) Explain the genesis of peaks at m/z 137, 135 and 85 in the mass spectrum of 1-Bromohexane.

ii) Explain McLafferty rearrangement.

iii) How will you differentiate the following pair of isomer by mass spectrometry?





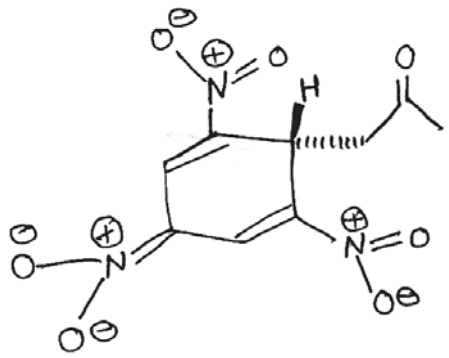
iv) Explain application of [M + 2] & [M+4] peak in MS.

v) Explain the genesis of ion

m/e : 123, 93, 77, 65, 51.

b) Draw different structure for compound $C_4H_8Br_2$ indicate how many different types of carbon are present in each structure. Then deduce the structure which shows signal at 32 δ(47), 42 δ(20), 62 δ(12) **[3]**

Q5) a) Assign the chemical shift to various carbons **[6]**



205.6 (s,w)

133.4 (s,w)

127.6 (d,str.)

121.6 (s,w)

47.0 (t)

34.5 (d)

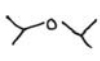
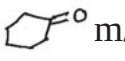
29.8 (q)

b) Answer Any two of the following : **[6]**

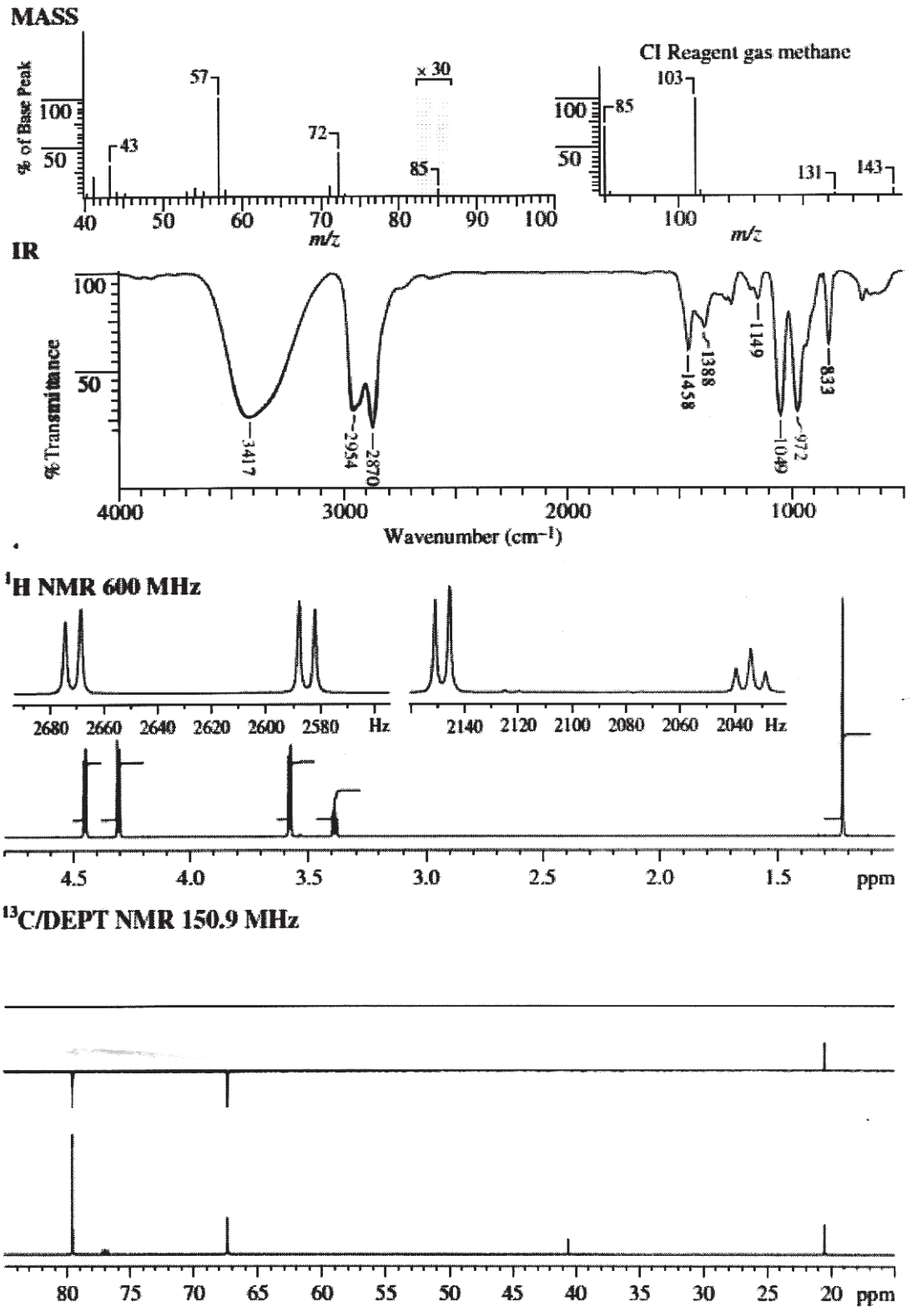
i) Use of Cosy in Spectra interpretation.

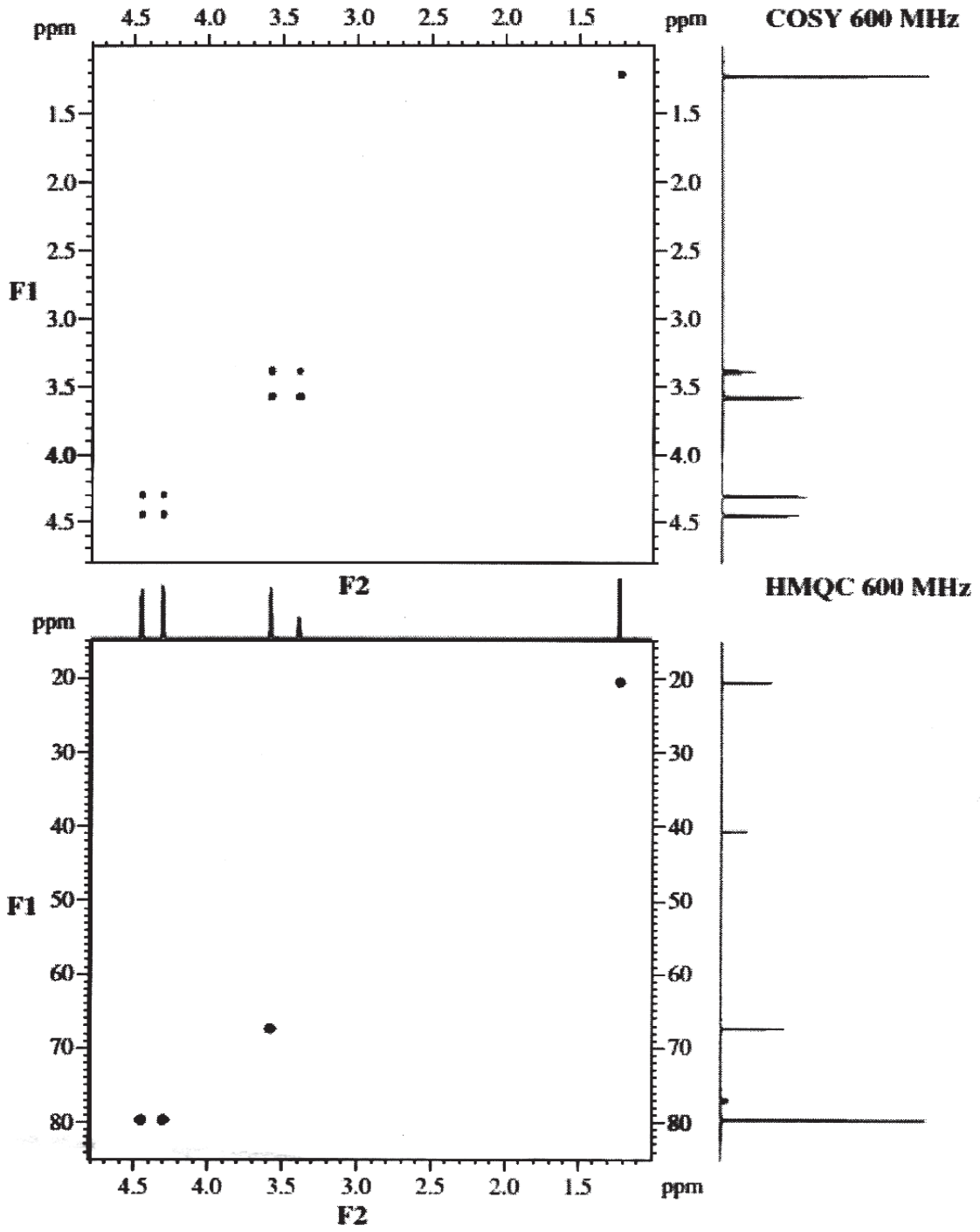
ii) Chemical ionization in MS.

iii) Explain the genesis of ions

1)  m/z 102, 87, 59, 45 2)  m/z, 98, 33

Q6) The spectra of unknown compound are given below. Analyze the spectra and use the data to arrive at a structure. **[12]**




COSY 600 MHz
ppm
4.5 4.0 3.5 3.0 2.5 2.0 1.5
F1
F2
HMQC 600 MHz
20 30 40 50 60 70 80

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Total No. of Questions : 6]

SEAT No. :

PA-3240

[Total No. of Pages : 3

[5911]-32
M.Sc.
DRUG CHEMISTRY
CCTP - 8 - CHD - 361 : Drug Discovery and Development
(2019 Pattern) (Semester - III)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Answer to the two sections should be written in separate answer books.***
3) ***Figures to the right indicate full makrs.***

SECTION - I

Q1) **a) Define the following :** **[8]**

i) ED_{50}

ii) Bioequivalence

iii) Receptor

iv) Pharmacodynamics.

b) Make a comment on Ayurveda system of medicine. **[3]**

Q2) **a) Answer any one of the following :** **[6]**

i) Give all the parameters used to study toxicological evaluation of new drugs.

ii) Define dosage forms. Discuss the liquid dosage forms with examples.

b) Discuss how the active ingradients are isolated from the following sources with examples. (any two) **[6]**

i) Microbial.

ii) Animal.

iii) Plant.

P.T.O.

Q3) **a) Answer <u>any one</u> of the following :** **[6]**

i) What is Lead? Discuss the different strategies used in the drug discovery.

ii) Explain all the phases involved in clinical trials?

b) Write a short note on (<u>any two</u>) **[6]**

i) Lead development.

ii) Phase I and II metabolism.

iii) Nucleic acid as a drug target.

<u>SECTION - II</u>

Q4) **a) Define the following :** **[8]**

i) Pilot plant.

ii) Drug action.

iii) Lead.

iv) Placebo.

b) Make a comment on semisolid dosage forms. **[3]**

Q5) **a) Answer <u>any one</u> of the following :** **[6]**

i) What is patent? Give it's Basic and Formal requirements of patents.

ii) What is Bioassays? Explain need of Bioassays. Give in detail the type of Bioassays.

b) Discuss the following : (<u>any two</u>) **[6]**

i) Scale up process.

ii) Preclinical testing.

iii) GMP.

Q6) **a) Answer <u>any one</u> of the following :** **[6]**

i) Give a brief account of the function performed by the following in a pharma industry.

a) R and D

b) GLP

c) Documentation

ii) Explain different routes of drug administration with examples.

b) Write a short note on (<u>any two</u>) **[6]**

i) Role of FDA and Institutional Review Board in clinical trials.

ii) Filing a patent Application.

iii) Approach to Rational drug discovery.

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Total No. of Questions : 6]

SEAT No. : ____

PA-3241

[Total No. of Pages : 6

[5911]-33

M.Sc. (Part - II)

DRUG CHEMISTRY

CHD - 362 : Stereochemical Principles and Applications

(2019 Pattern) (CBCS) (Semester - III)

Time : 3 Hours] ***[Max. Marks : 70***

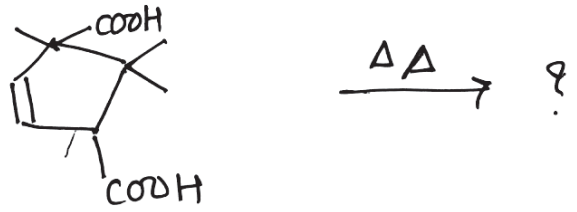
Instructions to the candidates :

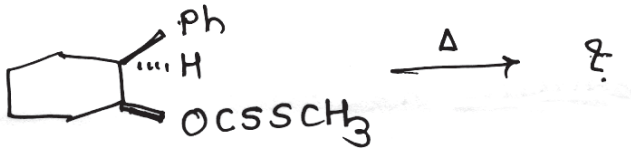
1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Answers to the two Sections should be written in separate answer books.***

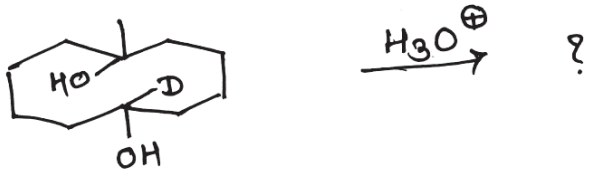
SECTION - I

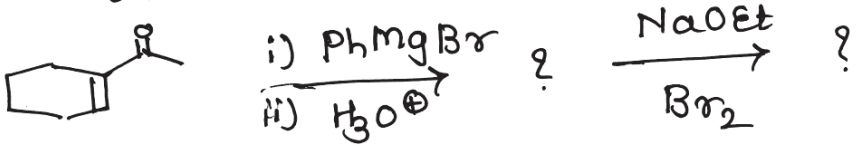
(Stereochemistry)

Q1) a) Predict the product/s of the following and explain the Stereochemical principles involved. **[8]**

i) 

ii) 

iii) 

iv) 

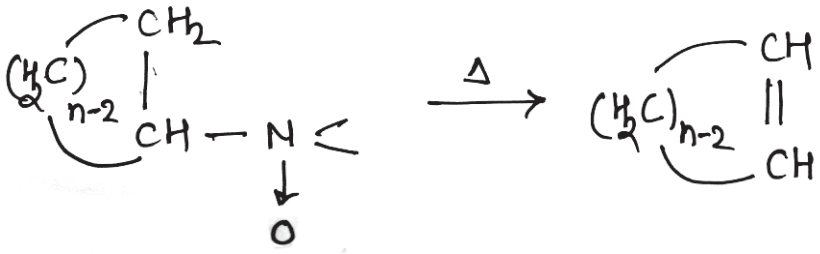
b) Half number of enantiomers are observed in case of bridge ring systems. **[3]**

P.T.O.

Q2) a) Answer <u>any Three</u> of the following : **[6]**

i) Cyclohexene on treatment with performic acid followed by hydrolysis gives trans 1, 2–diol, whereas trans - cyclodecene on similar reaction gives trans 1, 6 diol. Explain.

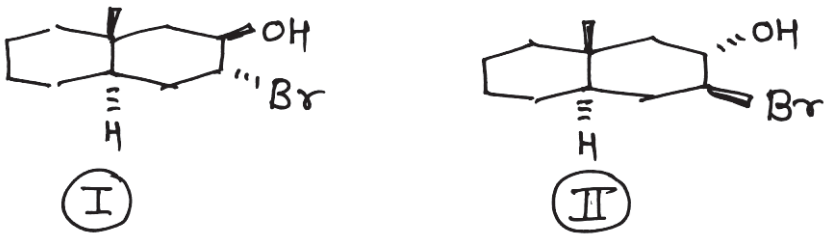
ii) Explain the following observations.



n = 6, 7, 8 → only cis olefin

n = 9, 10 → only trans olefin

iii) Which of these two compounds would form an epoxide on treatment with base? Explain.



iv) Write a note on I - strain.

b) Answer <u>any Two</u> of the following : **[6]**

i) Explain with examples of trans annular interactions.

ii) Draw the most stable conformations for

I) Bicyclo [2·2·2] octane

II) Trans 1, 3 ditert - butyl cyclohexane

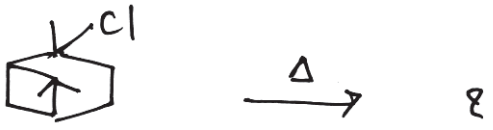
iii) Draw stable conformations of cis-syn-cis and cis-anti-cis perhydro phenanthrene. Calculate their energies and comment on their optical activities.

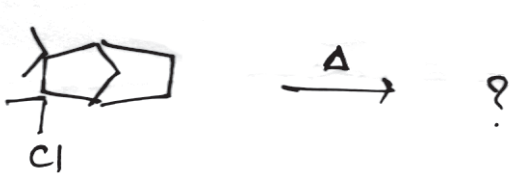
Q3) a) Answer the following (any Two) : **[6]**

i) Write a note on Saquinavir.

ii) The B-isomer of hexa chloro cyclohexane reacts very slowly with base than any of its isomers. Explain.

iii) Predict the product of the following reactions.

I) 

II) 

b) Answer the following (any Two) : **[6]**

i) Limitations of Bredt's rule.

ii) Explain -

I) 2 - Alkyl ketone effect.

II) 3 - Alkyl ketone effect.

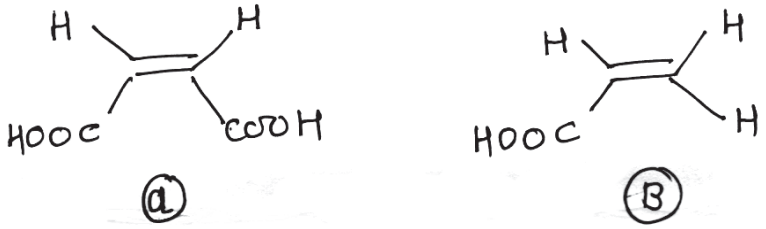
iii) Explain the dehydrohalogenation reaction of neomenthyl chloride and menthyl chloride with base.

SECTION - II

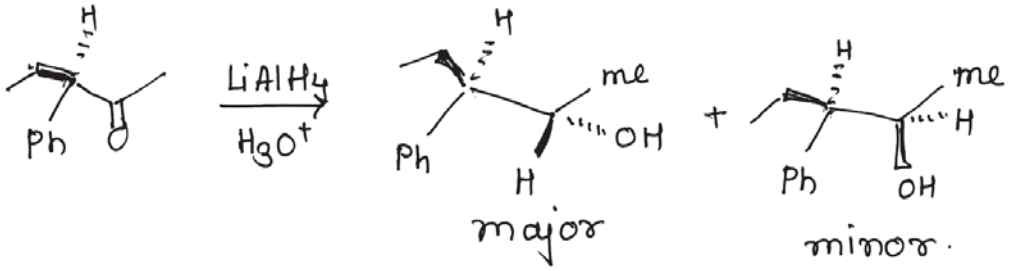
(Principles and Applications of Asymmetric Synthesis)

Q4) a) Attempt the following : **[8]**

i) Assign Re/si configuration of each hybridized carbon in following compound.

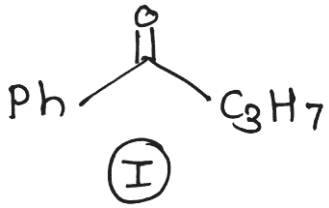


ii) Using Felkin rule, explain the following transformation.



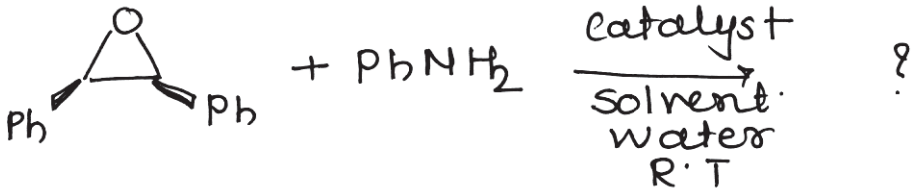
iii) Explain the concept of natural pool strategy, with suitable example.

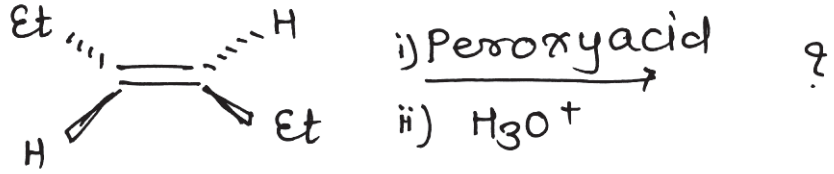
iv) Write the products by hydride attack from Re and Si faces on compounds (I). Give the relation between two products.

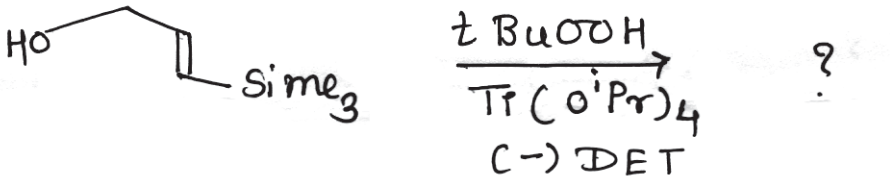


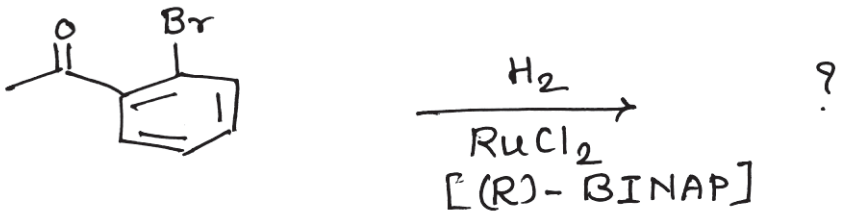
b) Write short note on 'Cram's rule' and its modification. **[3]**

Q5) a) Predict the product/s in <u>any Three</u> of the following and explain stereo chemical principles involved. Justify. **[6]**

i) 

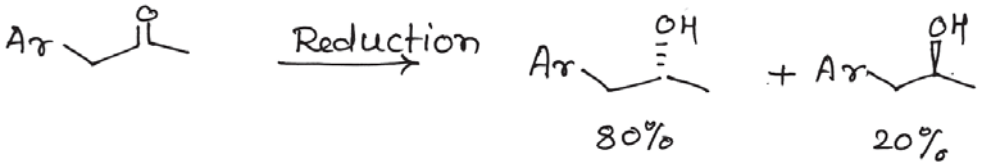
ii) 

iii) 

iv) 

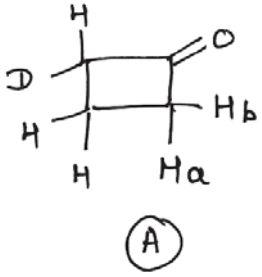
b) Attempt the following (Any Three) : **[6]**

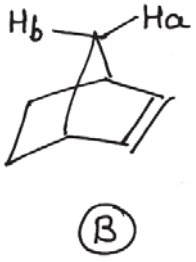
i) Explain the term optical purity. Calculate enantiomeric excess in following reactions.



ii) Describe the role of chiral solvating reagents in resolution.

iii) In the following molecules A and B indicates whether the hydrogens marked Ha, Hb are homotopic, enantiotopic or diastereotopic.

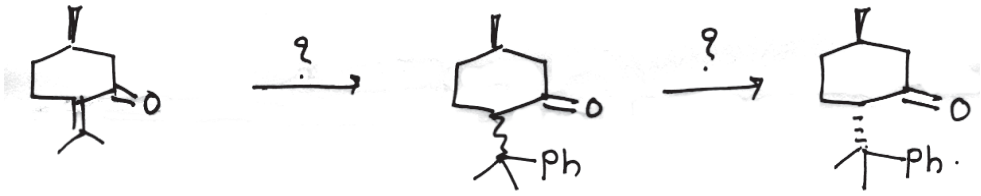




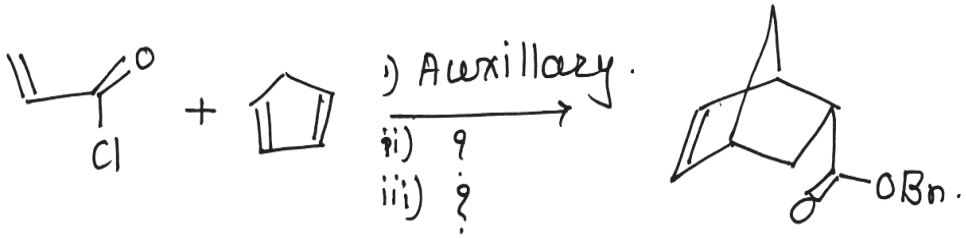
iv) Write a note on Asymmetric Aldol condensation.

Q6) a) Suggest the reagent and write mechanism of the following reactions. (Any Two) **[6]**

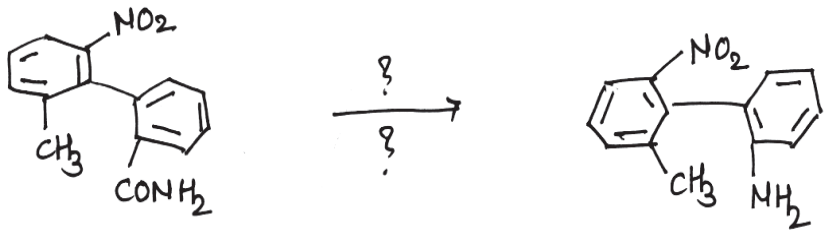
i)

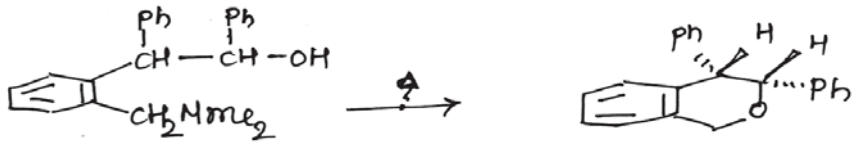


ii)

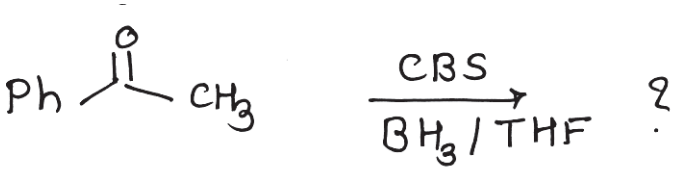


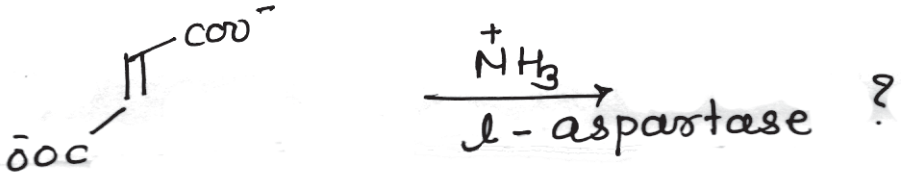
iii)



iv) 

b) Predict the product/s and write stereochemistry of the following reaction. (any Two) **[6]**

i) 

ii) 

iii) 

▽▽▽▽

Total No. of Questions : 6]

SEAT No. : ____

PA-3242

[Total No. of Pages : 6

[5911]-34

M.Sc. (Part - II)

DRUG CHEMISTRY

CBOP - 3, CHD - 363(A) : Chemistry of Heterocycles and Biologically Active Molecules

(2019 Pattern) (Semester - III)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates :

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Answers to the two Sections should be written in separate answer books.***

SECTION - I

Q1) a) Explain the following : **[8]**

i) Quinoline undergoes reduction more easily than naphthalene.

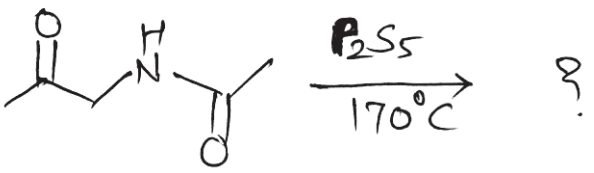
ii) Discuss the nitration of 4-hydroxy coumarin.

iii) Indole on reaction with chloroform, KOH and ethanol as a solvent gives 3-chloroquinoline as one of the product.

iv) Benzofuran shows $E^{\oplus}$ (electrophilic) substitution exclusively at the 2-position but indole at 3-position.

b) Predict the products in the following : **[3]**

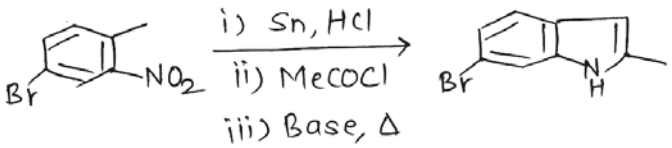
i) 

ii) 

P.T.O.

Q2) a) Suggest the suitable mechanism for any one of the following : **[6]**

I) i)



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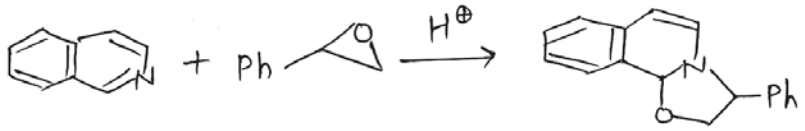
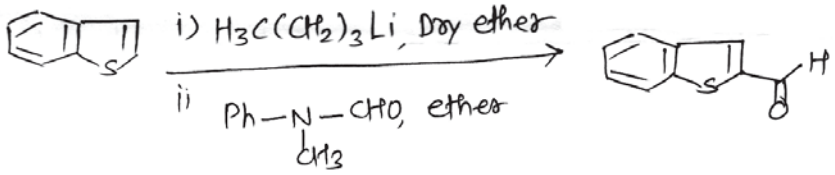


II) i)



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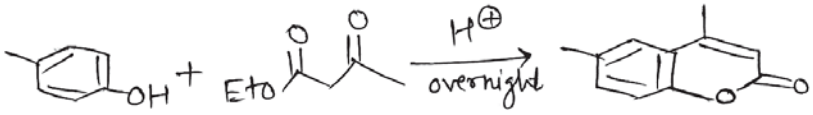


b) Write short notes on any two of the following : **[6]**

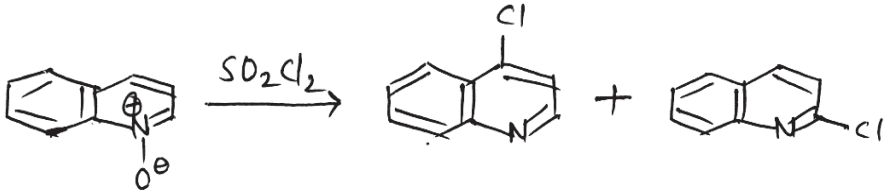
i) Fischer Indole synthesis.

ii) Bischler-Napieralski Isoquinoline synthesis.

iii) Gabriel Thiazole synthesis.

Q3) a) Suggest the suitable mechanism for any one of the following : **[6]**

I) i)



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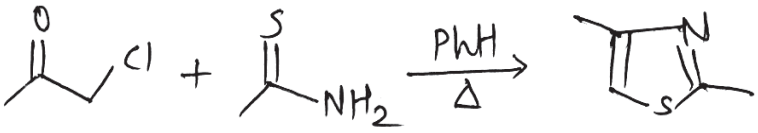
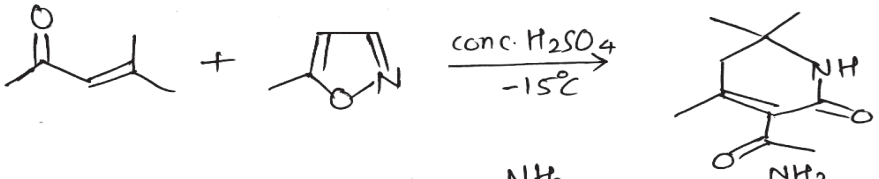
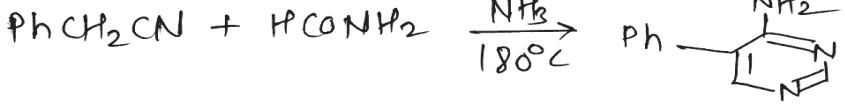


II) i)



ii)

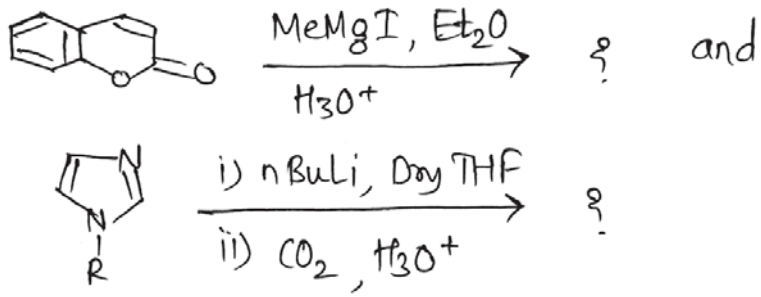


b) Answer any two of the following : **[6]**

i) Electrophilic attack on pyrazole is hindered in acid medium. Explain.

ii) Write short notes on skraup quinoline synthesis.

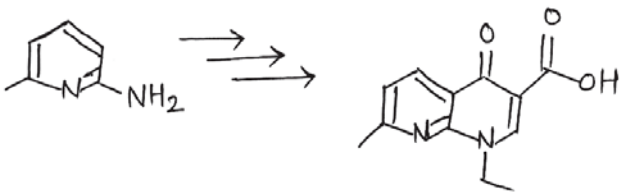
iii) Predict the product in the following.



SECTION - II

Q4) a) Describe the steps involved inthe synthesis of following drug molecules. Explain the mechanism involved. **[8]**

i)



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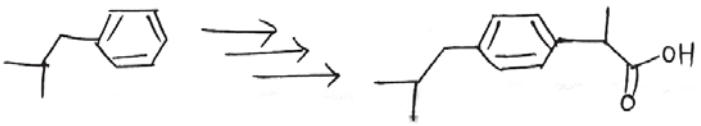

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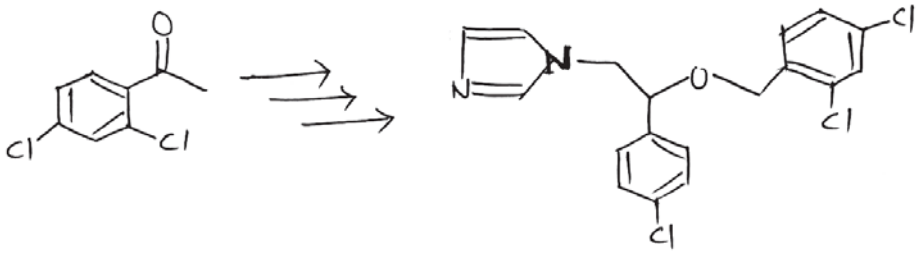

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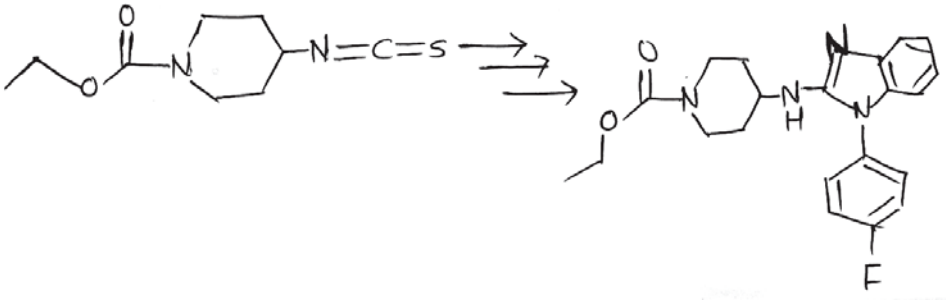
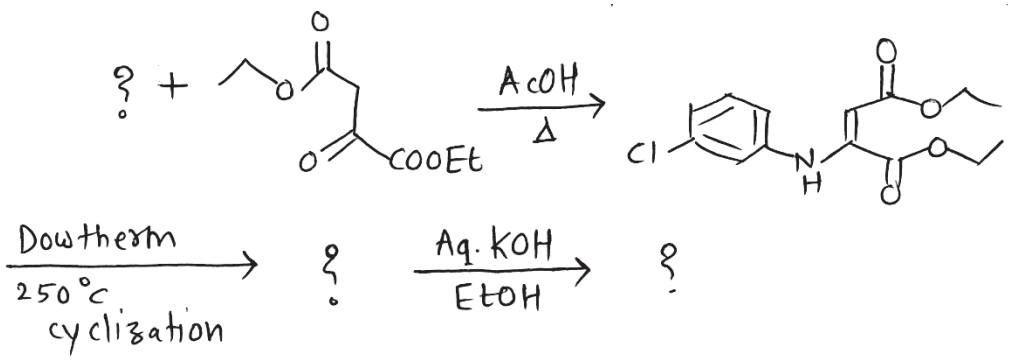
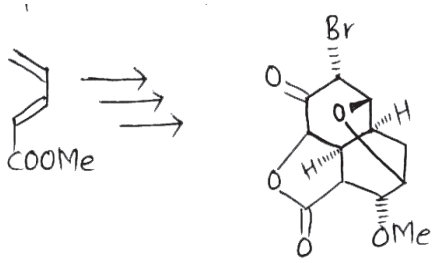


b) Insert the missing reagents in the following sequence of reactions. Explain the steps with mechanism. **[3]**



Q5) a) Discuss the steps involved in the synthesis of the following molecules. Explain the stereochemistry and mechanism involved in all steps (any one) **[6]**

I) i)



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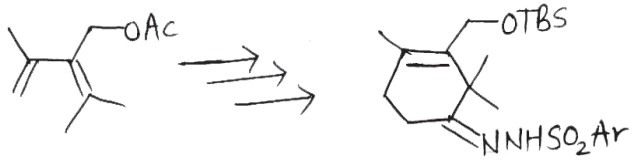
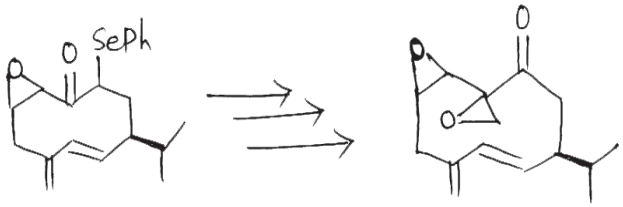


II) i)



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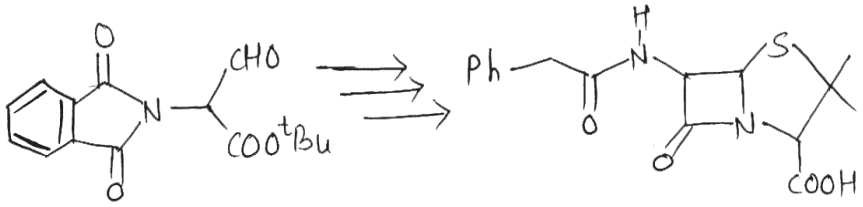
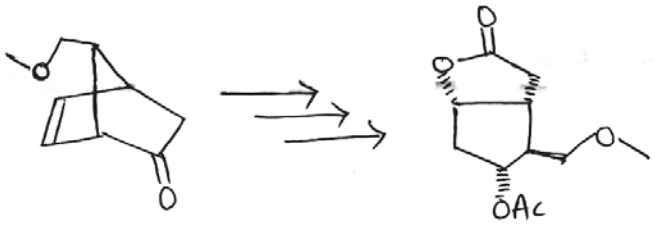


b) Discuss the steps involved in the synthesis of the following molecules. Explain the stereochemistry and mechanism involved (any two) **[6]**

i)



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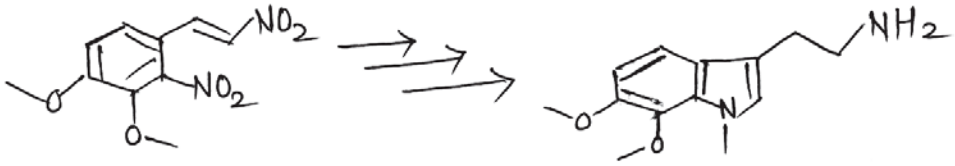
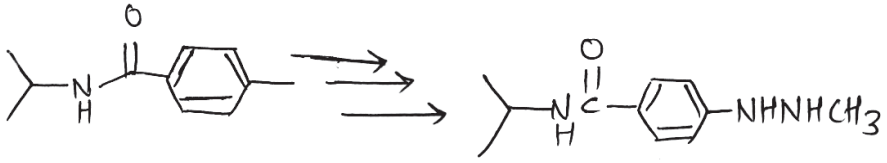
iii)



Q6) a) Describe the steps involved in the synthesis of the following drug molecules. Explain the mechanism involved (any one) **[6]**

I) i)



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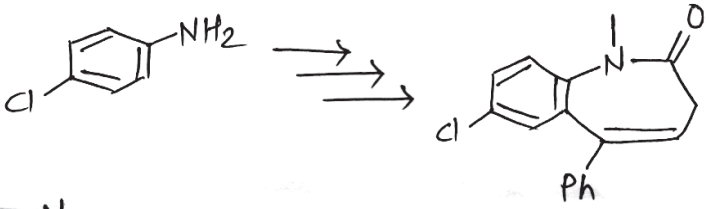
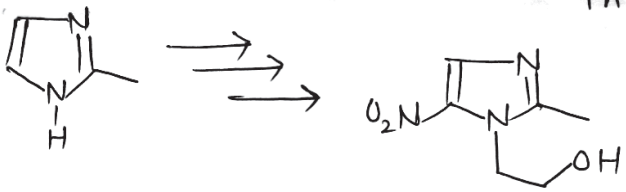


II) i)



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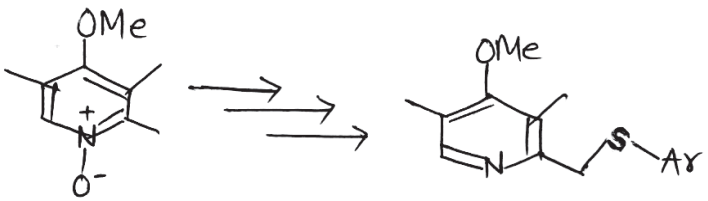
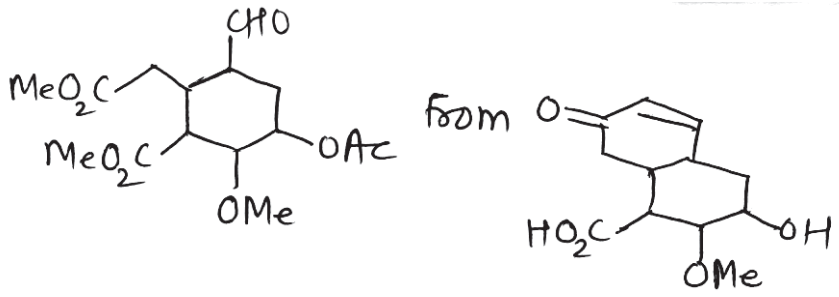


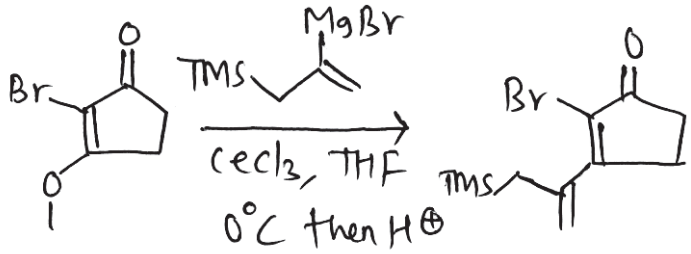
b) Answer any two of the following. **[6]**

i) Explain shapiro reaction with example.

ii) Devise a synthetic pathway for the following from the starting compound shown



iii) Role of $CeCl_3$ in the following.



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Total No. of Questions : 9]

SEAT No. : ____

PA-3243

[Total No. of Pages : 4

[5911]-35

M.Sc. (Part - II)

DRUG CHEMISTRY

CHD - 363 (B)

Section - I : Immunology and Microbiology

Section - II : Bioinformatics, Biostatistics in Drug Discovery

Section - III : Entrepreneurship Development

(2019 Pattern) (Semester - III)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates :

1) ***Attempt any two of I, II and III sections.***
2) ***Each section is for 35 marks.***
3) ***All question are compulsory.***
4) ***Figures to the right indicate full marks.***
5) ***Answers to the two Sections should be written in separate answer books.***

SECTION - I

CBOP - 3 - CHD - 363 (B) : Immunology and Microbiology

Q1) a) Answer the following : **[6]**

i) Explain the morphological characters of bacteria.

ii) Discuss in brief cell mediated and antibody mediated immunity.

b) Write a short note on : **[5]**

i) The Role of Cytokines in immune response.

ii) Designing Fermentation media.

P.T.O.

Q2) Answer any Three of the following : **[12]**

a) What is antimicrobial assay? How it is performed?

b) How bacteria are classified based on requirement of 'C' and energy source.

c) Explain the following :

i) Immunogen

ii) Antibodies

d) Differentiate between innate and adaptive immunities.

Q3) Answer any Four of the following : **[12]**

a) What are different methods for treatment of industrial effluent? Discuss any one of these.

b) Explain ELISA technique.

c) Describe primary and secondary immune response.

d) How will you screen the soil samples for antibiotic producers.

e) Describe the different parts of industrial scale fermenter.

SECTION - II

CBOP - 3 - CHD - 363 (B) : Bioinformatics, Biostatistics

Q4) a) Answer the following : **[6]**

i) Describe the types of biological databases.

ii) Write a short note on - Applications of genomics.

b) Attempt the following : **[5]**

i) Explain the terms - Negative correlation and chi-square Test with their significance.

ii) Metabolomics, make a comment.

Q5) Answer <u>any Four</u> of the following : **[12]**

a) Write a note on - Proteome analysis of an organism.

b) Discuss the steps involved in structure based drug designing.

c) Give the Uses and significance of canonical representations in chemoinformatics.

d) Define bioinformatics and write note on biological databases.

e) Write short note on - Gene 'Prediction Programs'.

Q6) Answer <u>any Three</u> of the following : **[12]**

a) Define the following terms :

i) Standard deviation

ii) Frequency of class

iii) Inclusive method of classification

iv) Class width

b) What is mean, median, mode. Compute the same for following data

Class	0-10	10-20	20-30	30-40	40-50
Frequency	5	8	13	6	3

c) The weights of coffee in 70 jars is as follows -

Weight (gm)	200-201	201-202	202-203	203-204	204-205	205-206
Frequency	13	27	18	10	01	01

Determine the variance and standard deviation of the above distribution.

d) Compute correlation for import of raw material and export of finished products.

Export	10	11	14	20	22	16	12
Import	12	14	15	16	21	26	21

SECTION - III

CBOP - 3 - CHD - 363 (B) : Entrepreneurship Development

Q7) a) Answer the following : **[6]**

i) Explain the process of Entrepreneurship Development.

ii) Explain Leibenstein's X-efficiency theory.

b) Write short note on the following : **[5]**

i) Women Entrepreneur.

ii) Conducing feasibility studies.

Q8) Answer any Three of the following : **[12]**

a) What are the steps involved in business plan process. Explain in brief.

b) Entrepreneurship does not emerge spontaneously. Explain.

c) Discuss in brief entrepreneural search and identification.

d) Make a comment on factors affecting entrepreneural growth.

Q9) Answer any Four of the following : **[12]**

a) Explain the opportunities for small entrepreneurs in India.

b) Differentiate between manager and entrepreneurs.

c) "Profit is the reward of entrepreneur" - Comment on the statement.

d) Explain the problems faced by women entrepreneur.

e) Write a short note on organization and management.

▽▽▽▽

Total No. of Questions : 6]

SEAT No. :

PA-3244

[Total No. of Pages : 3

[5911]-41

S.Y.M.Sc.

DRUG CHEMISTRY

CCTP-10 : CHD-460 : Advanced Medicinal Chemistry

(2019 Pattern) (Semester-IV)

Time : 3 Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Answers to the two sections should be written in separate answer books.***

SECTION-I

Q1) a) Answer the following. **[6]**

i) What are the differences bet^{n} bacterial and animal cells. Discuss selective toxicity of cephalosporins and sulfonamides towards bacteria.

ii) Discuss in brief discovery of quinolone antibiotics. Explain the development of fluoroquinolones and their uses.

b) Attempt the following. **[5]**

i) Drug Resistance mechanism.

ii) Role of plant products in caneer treatment.

Q2) Answer any four of the following. **[12]**

a) Explain how antifungal agents fluconazole, griseofulvin and amphotericin-B affect the fungal biochemical processess.

b) Give a brief account of antileprotic agents.

c) Explain in brief life cycle of malarial parasite.Give the names of antimalarial agents acting on each step.

d) Discuss in brief the following antibiotics.

i) Tetracyclines

ii) Aminoglycosides

e) Discuss in brief the role of enzyme inhibitors as drug molecules.

P.T.O.

Q3) Answer any three of the following. **[12]**

a) Explain protein biosynthesis. Discuss in brief how chloramphenical, erythromycin exert their therapeutic effect.

b) Explain the role of following as anticancera agents **[5]**

i) Alkylating agents

ii) Antimetabolites.

c) Give a brief commetony on development of following penicillins.

i) Ampicillin

ii) Amoxycillin

iii) Fludoxacillin

d) Give a brief account of various classes of antiviral agents. Explain the mode of action for each.

SECTION-II

Q4) a) Answer the following. **[6]**

i) Explain various classes of antidepressants. Discuss the mode of action of MAO inhibitors.

ii) Explain the use of following in treatment of convulsions. Clearly mention the mode of action of each.

1) Phenytoin

2) Benzodiazepines

b) Explain the use of following agents with their mode of action. Give the example of each. **[5]**

i) Opioid analgesics

ii) Cardiac glycosides

Q5) Answer any four of the following. **[12]**

a) Discuss in brief any two of the cardiovascular disorders and their management.

i) Angina

ii) Congestive Heart Failure

iii) Arrythmia

b) Explain in brief NIDDM and IDDM. Discuss the management of NIDDM.

c) Discuss the biochemical basis of inflammation. How non-steroidal anti-inflammatory drugs exhibit their activity.

d) Discuss in brief various GIT disorders. Explain ulcers and the approaches to treat ulcers.

e) Discuss the following in brief.

i) β-Blockers

ii) Vasodilators

iii) Organic Nitrates

Q6) Answer any three of the following. **[12]**

a) Discuss the functions and disorders associated with following hormones.

i) Thyroxine

ii) Calcitonin

iii) Growth hormone

b) Discuss the uses and mode of actions of the following

i) Carbamazepine

ii) Methimazole

iii) Morphine

c) Discuss neuronal signal transmission. How this process is affected in convulsions. Discuss the strategies to overcome this.

d) Discuss the following classes of drugs in brief

i) Diuretics

ii) Thrombolytics

clearly state their uses and mode of action.

Total No. of Questions : 6]

SEAT No. : ____

PA-3245

[Total No. of Pages : 3

[5911]-42

M.Sc.-II

DRUG CHEMISTRY

CCTP-11 : CHD-461 : Drug Design

(2019 Pattern) (Semester-IV)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Answer to the two sections should be written in separate answer books.***
3) ***Figures to the right indicate maximum marks.***

SECTION - I

Q1) a) Define the following **[8]**

i) Full agonist

ii) Pharmacophore

iii) Receptor

iv) Inverse agonist

b) Explain the structure of cell membrane with well labelled diagram. **[3]**

Q2) a) Answer any one of the following: **[6]**

i) Describe signalling mechanism for the tyrosine kinase receptor family.

ii) Give a comment on case studies of statins.

b) Explain any two of the following **[6]**

i) Drug design based on pharmakinetics

ii) Free-wilson approach.

iii) features of Ideal prodrug.

P.T.O.

Q3) a) Answer any one of the following. **[6]**

i) What is need for prodrug design? Explain with suitable examples the benefits of prodrugs over routine drugs.

ii) Make a comment of following used in QSAR.

1) Hydrophobicity

2) Electronic factors

3) Steric factors.

b) Explain any two of the following. **[6]**

i) Intracellular receptors.

ii) Applications of prodrug

iii) Design of Agonist

SECTION-II

Q4) a) Define the following . **[8]**

i) Genomics

ii) Linker

iii) Proteomics

iv) Combinatorial chemistry.

b) Define the term 'Energy minimisation, explain how this technique is central in many drug design techniques. **[3]**

Q5) a) Answer any one of the following. **[6]**

i) What is parallel synthesis? Explain

1) Automated parallel synthesis.

2) Haughton's teabag procedure.

ii) What is DNA Microarrays? How DNA microarrays could be used to diagnose a disease? Explain in detail.

b) Discuss any two of the following. **[6]**

i) Monoclonal antibodies.

ii) Virtual screening

iii) Antisense technology.

Q6) a) Answer any one of the following. **[6]**

i) What is human gene therapy? Explain it's types? How it can be used in cancer treatment?

ii) Explain any two methods used in search of Conformational analysis.

b) Write a short note on (Any two) **[6]**

i) Highthrough put screening.

ii) Docking.

iii) Solid phase synthesis

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Total No. of Questions : 6]

SEAT No. :

PA-3246

[Total No. of Pages : 7

[5911]-43
M.Sc. - II
DRUG CHEMISTRY
CBOP - 4 CHD - 462(A) : Advanced Synthetic Methods in Chemistry
(2019 Pattern) (Semester - IV)

Time : 3 Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Answers to the two sections should be written in separate answer books.***

SECTION - I

Q1) a) Complete the following conversions by using suitable reagents. **[8]**

i) 

ii) 

iii) 

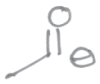
iv) 

b) Reconnection approach is preferred over disconnection approach in 1.6 dicarbonyl compound synthesis. Explain. **[3]**

P.T.O.

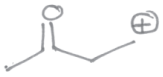
Q2) A) Answer any one of the following: **[6]**

a) Give synthetic equivalents of the following and illustrate your answer with one example.

i) 

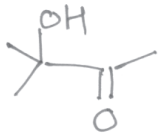
ii) 

iii) 

iv) 

b) i) Mom protection is preferred over methyl protection for - OH group.

ii) Synthesize the following compound by umpolung method.



B) Explain the following. [any Two] **[6]**

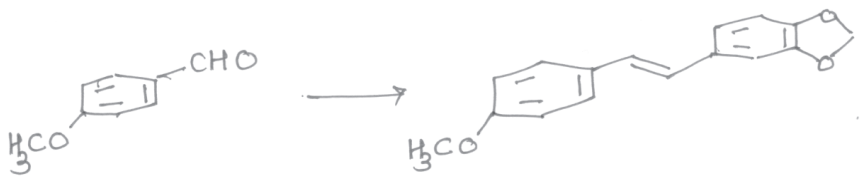
a) How will you synthesize 1, 5 di-carbonyl compounds.

b) Convergent synthesis is better than linear synthesis.

c) Two methods for the synthesis of 1, 2 dicarbonyl compounds.

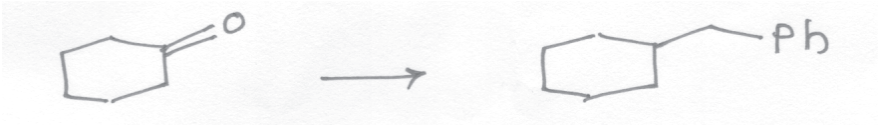
Q3) A) Answer any one of the following: **[6]**

a) i) Arrange the reagents in proper order.

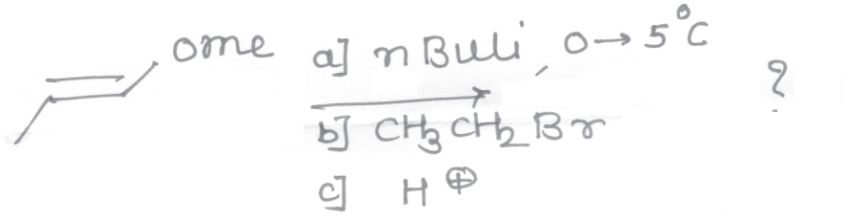


Ko^{t}Bu ;  TsoH; Tscl; nBuli; $NaBH_4$;

ii) Carry out the following transformation by enamine approach.

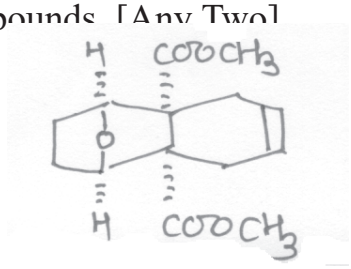


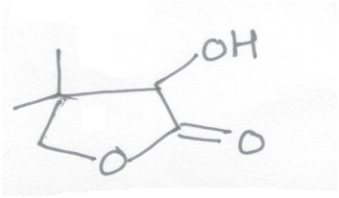
b) i) What is umpolung of reactivity? Predict the product and suggest the mechanism of the following.

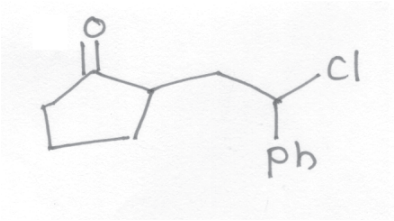


ii) Why enamine approach is better than the base catalysed alkylation of Ketone.

B) Using retrosynthetic analysis suggest a suitable method to synthesize the following compounds. [Any Two] **[6]**

a) 

b) 

c) 

SECTION - II

Q4) a) Answer any Four of the following. **[8]**

i) How will you prepare Ketone from thioester.

ii) Non terminal alkenes can be converted to terminal alkenes using hydroboration reaction.

iii) Hetero atom directed lithiation reactions can be used to synthesize o-substituted benzoic acid from benzoic acid.

iv) Secondary amine prefrentially used in the Mannich reaction.

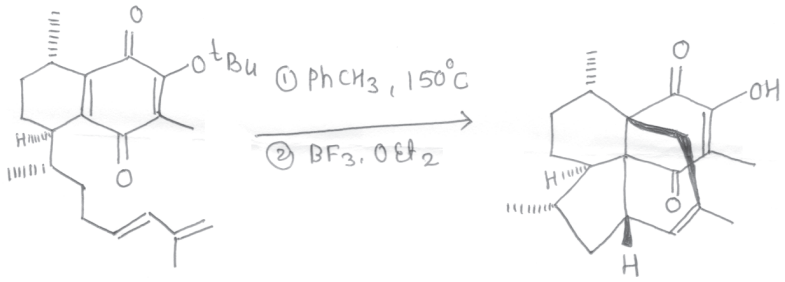
v) Give application of organo alluminium in organic synthesis.

b) Suggest the mechanism for the following reaction. **[3]**

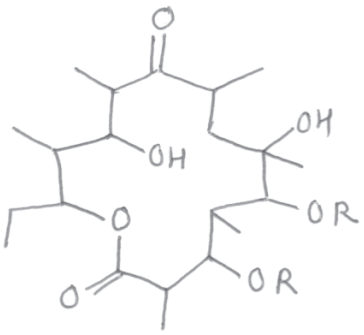
$$(H_3C-CH_2-CH_2)_3-B \xrightarrow[\text{② } H_2O_2, 8_4]{\text{① NaCN, } (CF_3CO)_2O} H_3C-CH_2-CH_2-OH$$

Q5) a) Answer any two of the following. **[6]**

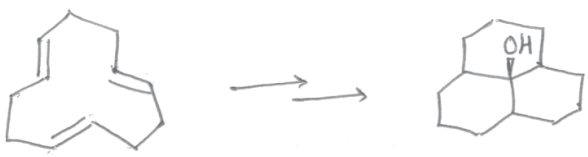
i) What is Domino reaction? Explain the steps involved in the following conversion.



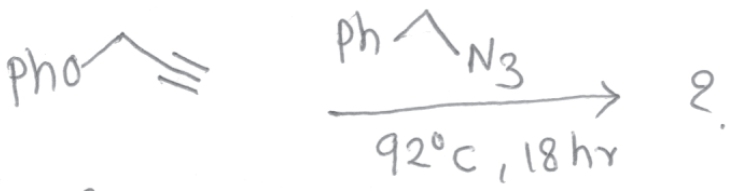
ii) Explain the biomimetic approach to retrosynthesis to obtain the following compound

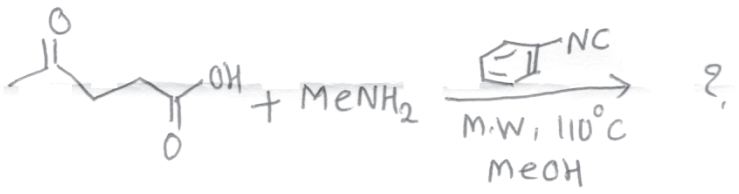


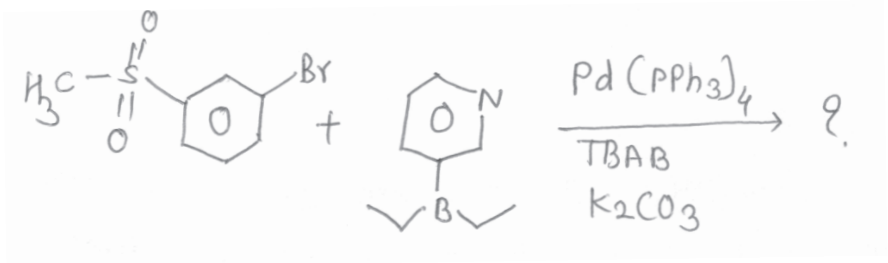
iii) Carryout the following conversion using organoborane.

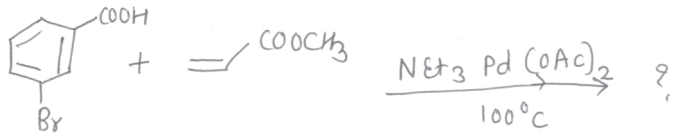


b) Predict the product of any three of the following. **[6]**

i) 

ii) 

iii) 

iv) 

Q6) a) Write short notes on any two of the following. **[6]**

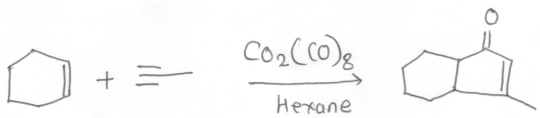
i) Heck Reaction

ii) Reppe oxidation

iii) Nazerov cyclization

b) Suggest the Mechanism of any two of the following. **[6]**

i)



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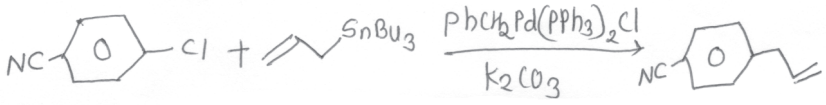

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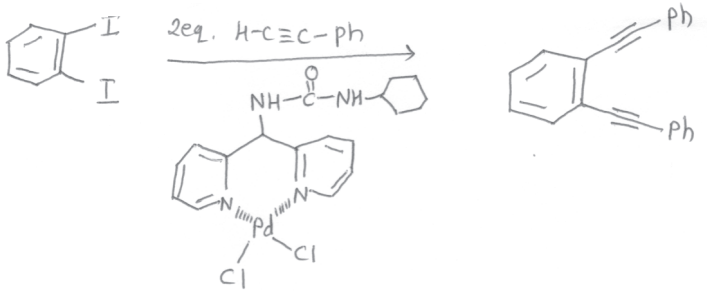

Total No. of Questions : 6]

SEAT No. : ____

PA-3247

[Total No. of Pages : 3

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M.Sc.-II

DRUG- CHEMISTRY

CBOP-4 : CHD-462 (B)- Supramolecular, Green Chemistry and Forensic Chemistry

(2019 Pattern) (Semester-IV)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Answer to the two sections should be written in separate answer books.***

SECTION-I

Q1) a) Answer the following: **[6]**

i) Explain the concept of supramolecular catalysis.

ii) Discuss in brief the importance of various intermolecular forces in supramolecular. designs.

b) Write short notes on: **[5]**

i) Solvent free reactions.

ii) Ultra sound assisted substitution and addition reactions.

Q2) Answer any four of the following: **[12]**

a) Explain catalysis by reactive Macrocydic cation receptor molecules with suitable example.

b) Discuss dinuclear and polynuclear metal ion cryptates.

c) Explain the aq. phase syn and anti dihydroxylation. Explain the advantages of 99. reactions over conventional route.

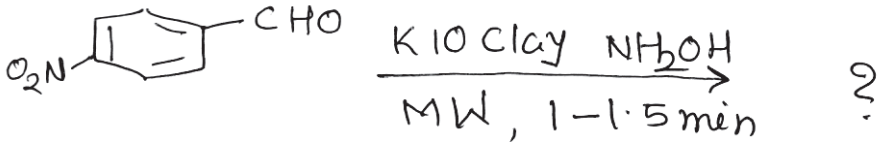
d) Explain the concept design principle of molecular receptor.

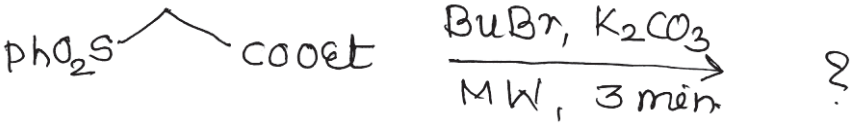
e) Explain the principles of green chemistry with suitable examples.

P.T.O.

Q3) Answer any four of the following: **[12]**

a) Identify the products in following reactions.

i) 

ii) 

b) Application of biocatalysts in organic synthesis.

c) Explain the solid state organic synthesis giving at least one example of Michal addition and Beckman rearrangement.

d) Explain the formation of supramdecular macrocycle using barbituric acid and 2,4,6- traiamino pyrimidine.

e) Explain the transport processes with the help of anion carriers.

SECTION-II

Q4) a) Answer the following: **[6]**

i) What are designer drugs? Give the classification of designer drugs with suitable examples.

ii) Give a brief over view of clandestine laboratory investigation.

b) i) Discuss in brief the classification of finger prints. **[5]**

ii) Discuss the different types of narcotic and other drugs with suitable example.

Q5) Answer any four of the following. **[12]**

a) What are the different path ways of drug metabolism? Discuss their importance in drug analysis.

b) Discuss the principle for isolation and determination of amphetamine and methamphetamine from urine sample.

c) Explain invisible fingermark development using powder and fuming methods.

d) Discuss the spot tests used in aralysis of opioid analgesics.

e) Discuss Drug and solvent abuse in brief.

Q6) Answer any four of the following: **[12]**

a) Explain the use of chromatographic techniques in analysis of narcotic substances.

b) Explain the forensic significance of Footprints.

c) Explain the procedure of extraction of caffeine from biological sample.

d) Write a short note on cheiloscopy.

e) Discuss the medicinal uses of naracotic drugs discuss what are the problems associated with their use.

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