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SEAT No._____ No. of Printed Pages : 4+6

[484A-97]

SARDAR PATEL UNIVERSITY

M.Sc. SEMESTER – IV (Organic Chemistry) Examination

Thursday, 2nd November 2017

Time: 02:00 pm - 05:00 pm

PS04CORC01: Spectroscopy-II

[Total Marks – 70]

Note: Figures to the right indicate full marks

Q.1 Answer the following multiple choice questions. **[08]**

1 Saturated aliphatic ketones shows stretching vibration band at _____ cm^{-1} in IR spectroscopy.
(a) 1000 -1050 (b) 1200 -1250 (c) 1700 -1750 (d) 1500 - 1550

2 In UV spectroscopy, saturated compound containing hetero atoms gives absorption for _____ transition.
(a) $n \rightarrow \sigma^*$ (b) $n \rightarrow \pi^*$ (c) $\sigma \rightarrow \pi^*$ (d) $\pi \rightarrow \pi^*$

3 Furfuraldehyde is _____ type system according to spin-spin coupling.
(a) AX_2 (b) AMX (c) A_2X_2 (d) AX

4 Full form of HMBC is _____.
(a) Homonuclear Multiple Bond Coherence (b) Homonuclear Multiple Bend Coherence
(c) Heteronuclear Multiple Bond Coherence (d) Heteronuclear Main Bond Coherence

5 The sensitivity of ^{13}C compared with ^{1}H is about_____.
(a)1/5700 (b) 1/1 (c) 5700 (d) 5700/1

6 The proton-decoupled CMR spectra give highly useful information regarding _____.
(a) Symmetry (b) Asymmetry (c) Isomerism (d) None of these

7 _____ may the stable neutral molecule eliminated during fragmentation.
(a) Water (b) Polymer (c) Acid (d) Carbon

8 A compound having one bromine atom will have two peaks in molecular ion region with the intensities _____.
(a) 3:1 (b) 1:3 (c) 1:2 (d) Almost 1:1

Q.2 Answer the following questions. (Any seven) **[14]**

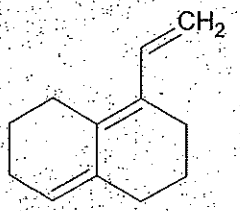
1. Discuss the O-H stretching vibrations observed in the IR spectra of o- hydroxy acetophenone and p- hydroxy-acetophenone.
2. Explain stretching and bending vibrations for CO_2 molecules.
3. Explain the Lambert – beer's law.
4. What is the use of shift reagent?
5. Enlist different type of coupling constants & explain any one in detail.
6. Draw the ^1H-^1H cosy spectrum for m-dinitro benzene by taking approximate δ value for each signal.
7. What are the difficulties observed in production of ^{13}C spectra?
8. Illustrate Electron Impact method in short.
9. Explain the mass spectra of 2- Pentanone.

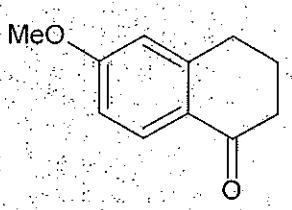
Q.3

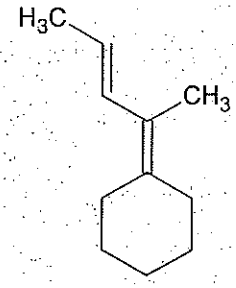
[A] Discuss the important characteristics vibrations observed in the IR spectra of esters & lactones. **[06]**

[B] Calculate the λ_{max} for the following compounds. **[06]**

1) 2) 3)







OR

[B] Answer the following questions.

I Explain the Chromophores and Auxochromes in detail. **[03]**

II In case of UV spectroscopy, explain the characteristic absorption in alkenes. **[03]**

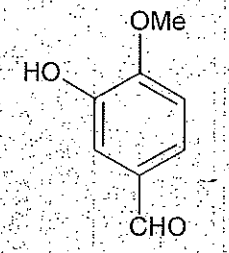
Q.4

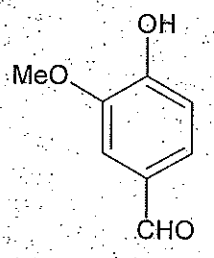
[A] Answer the following questions.

I Explain the Proton exchange and D_2O exchange in PMR. **[03]**

II What is nuclear over hauser effect in PMR? How will you differentiate following isomers using NOE-PMR spectra? **[03]**

1) 2)





[B] **Answer the following questions.**

I What is the importance of magnetic equivalence in PMR spectroscopy? Sketch the PMR spectra of p-nitro chlorobenzene in terms of magnetic non equivalence. **[03]**

II Write note on chemical shift. Enlist the advantages of TMS. **[03]**

OR

[B] **Answer the following questions.**

I Sketch the expected PMR spectrum for styrene by taking approximate δ value for each signal and show that styryl group is an AMX system with three coupling constants. **[03]**

II Explain the Relaxation process in case of PMR spectroscopy. **[03]**

Q.5

[A] **Answer the following questions.**

I Draw the ^{1}H-^{1}H cosy spectrum for 3-heptanone by taking approximate δ value for each signal. **[03]**

II A compound with molecular formula $C_5H_{10}O$ shows following signals in its proton coupled ^{13}C-NMR spectra. Interpret the data and assign the structure of the compound. **[03]**

δ = 18 (Quartet, 6H), δ = 28 (Quartet, 3H), δ = 42 (Doublet, 1H), δ = 212 (Singlet)

[B] **Answer the following questions.**

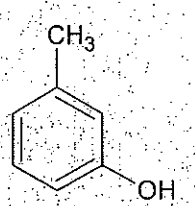
I Sketch Normal ^{13}C-NMR, DEPT-90 and DEPT-135 spectra for Ipsenol compound. **[03]**

II What kind of structural informations are provided by HMBC & Inadequate spectra? **[03]**

OR

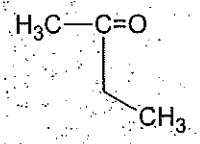
[B] Calculate the ^{13}C-NMR chemical shift for the following molecules. **[06]**

1)



2) $HO\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}NH_2$

3)



Q.6

[A] **Answer the following questions.**

I Write the general rules for predicting prominent peaks in EI spectra. **[03]**

II Write note on Mclafferty rearrangement. **[03]**

[B] A compound has molecular formula $C_9H_{10}O$, It gives the following spectral data. Interpret the spectral data and determine the structure of the compound. **[06]**

IR: 3027,2824,1724,1603,1496,1388,746 cm^{-1}

^{1}H NMR:

Signal (δ value)	Multiplicity	Protons
2.78	Triplet	2H
2.98	Triplet	2H
7.22	Doublet	3H
7.24	Triplet	
7.32	Triplet	2H
9.85	Triplet	1H

^{13}C NMR:

^{13}C (δ value) : 28,46,126.2,128.4,128.5,141,204

Mass (m/z) (%r.a.): 134(45%), 133(6%), 105(34%), 91(100%), 77(30%), 51(25%)

OR

[B] Answer the following questions.

I State and explain Nitrogen rule. **[03]**

II Write note on Fast Atomic Bombardment and Chemical Ionization techniques used in mass spectroscopy. **[03]**

Best Of Luck

Characteristic Proton Chemical Shifts

Type of proton		Chemical shift, ppm δ
Cyclopropane		0.2
Primary	RCH_3	0.9
Secondary	R_2CH_2	1.3
Tertiary	R_3CH	1.5
Vinylic	C=C—H	4.6–5.9
Acetylenic	C≡C—H	2–3
Aromatic	Ar—H	6–8.5
Benzylic	Ar—C—H	2.2–3
Allylic	C=C—CH_3	1.7
Fluorides	HC—F	4–4.5
Chlorides	HC—Cl	3–4
Bromides	HC—Br	2.5–4
Iodides	HC—I	2–4
Alcohols	HC—OH	3.4–4
Ethers	HC—OR	3.3–4
Esters	R.COO—CH	3.7–4.1
Esters	HC—COOR	2–2.2
Acids	HC—COOH	2–2.6
Carbonyl compounds	HC—C=O	2–2.7
Aldehydic	R-CHO	9–10
Hydroxylic	R-OH	1–5.5
Phenolic	Ar-OH	4–12
Enolic	C=C—OH	15–17
Carboxylic	RCOOH	10.5–12
Amino	RNH_2	1–5

Characteristic Infrared Absorption Frequencies

Bond	Compound type	Frequency range, cm^{-1}
C-H	Alkanes	2850-2960 1350-1470
C-H	Alkenes	3020-3080 (m) 675-1000
C-H	Aromatic rings	3000-3100 (m) 675-870
C-H	Alkynes	3300
C=C	Alkenes	1640-1680 (v)
C≡C	Alkynes	2100-2260 (v)
C=C	Aromatic rings	1500, 1600 (v)
C-O	Alcohols, ethers, carboxylic acids, esters	1080-1300
C=O	Aldehydes, ketones, carboxylic acids, esters	1690-1760
O-H	Monomeric alcohols ,phenols Hydrogen bonded alcohols, phenols Carboxylic acids	3610-3640 (v) 3200-3600 (broad) 2500-3000 (broad)
N-H	Amines	3300-3500 (m)
C-N	Amines	1180-1360
C≡N	Nitriles	2210-2260 (v)
$-NO_2$	Nitro compounds	1515-1560 1345-1385

(P.T.O.)

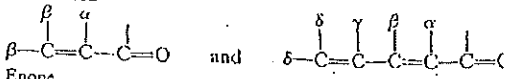
Characteristic absorption for dienes

Base value for heteroannular diene	214
Base value for homoannular diene	253
Increments for	
Double bond extending conjugation	+30
Alkyl substituent or ring residue	+5
Exocyclic double bond	+5
Polar groupings: OAc	+0
OAlk	+6
SAlk	+30
Cl, Br	+5
$N(Alk)_2$	+60
Solvent correction[a]	+0
λ_{calc} = Total	

Characteristic absorption for substituted benzene derivatives

ArCOR/ArCHO/$ArCO_2H$/$ArCO_2R$		λ_{max}^{EtOH} (nm)
Parent chromophore: Ar = C_6H_5		
G = Alkyl or ring residue, (e.g., ArCOR)		246
G = H, (ArCHO)		250
G = OH, OAlk, ($ArCO_2H$ and $ArCO_2R$)		230
Increment for each substituent on Ar:		
—Alkyl or ring residue	o-, m-	+3
	p-	+10
—OH, $—OCH_3$, —OAlk	o-, m-	+7
	p-	+25
$—O^-$ (oxyanion)	o-	+11
	m-	+20
	p-	+78[b]
—Cl	o-, m-	+0
	p-	+10
—Br	o-, m-	+2
	p-	+15
$—NH_2$	o-, m-	+13
	p-	+58
$—NHCOCH_3$	o-, m-	+20
	p-	+45
$—NHCH_3$	p-	+73
$—N(CH_3)_2$	o-, m-	+20
	p-	+85

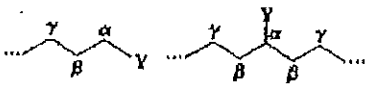
Characteristic absorption for α, β-unsaturated carbonyl compounds



Enone and Dienone

Base values		(nm)
Acyclic α,β-unsaturated ketones		215
Six-membered cyclic α,β-unsaturated ketones		215
Five-membered cyclic α,β-unsaturated ketones		202
α,β-Unsaturated aldehydes		210
α,β-Unsaturated carboxylic acids and esters		195
Increments for		
Double bond extending conjugation		+30
Alkyl group, ring residue	α	+10
	β	+12
	γ and higher	+18
Polar groupings: —OH	α	+35
	β	+30
	δ	+50
—OAc	α,β,δ	+6
—OMe	α	+35
	β	+30
	γ	+17
	δ	+31
—SAlk	β	+85
—Cl	α	+15
	β	+12
—Br	α	+25
	β	+30
—NR_2	β	+95
Exocyclic double bond		+5
Homodiene component[a]		+39

^{13}C shifts for terminal and internal systems



Y	α Terminal	α Internal	β Terminal	β Internal	γ
CH_3	+ 9	+ 6	+10	+ 8	−2
$CH=CH_2$	+20		+ 6		−0.5
$C\equiv CH$	+ 4.5		+ 5.5		−3.5
COOH	+21	+16	+ 3	+ 2	−2
COO^-	+25	+20	+ 5	+ 3	−2
COOR	+26	+17	+ 3	+ 2	−2
COCl	+33	+28		+ 2	
$CONH_2$	+22		+ 2.5		−0.5
COR	+30	+24	+ 1	+ 1	−2
CHO	+31		0		−2
Phenyl	+23	+17	+ 9	+ 7	−2
OH	+48	+41	+10	+ 8	−5
OR	+58	+51	+ 8	+ 5	−4
OCOR	+51	+45	+ 6	+ 5	−3
NH_2	+29	+24	+11	+10	−5
NH_3^+	+26	+24	+ 8	+ 6	−5
NHR	+37	+31	+ 8	+ 6	−4
NR_2	+42		+ 6		−3
NR_3^+	+31		+ 5		−7
NO_2	+63	+57	+ 4	+ 4	
CN	+ 4	+ 1	+ 3	+ 3	−3
SH	+11	+11	+12	+11	−4
SR	+20		+ 7		−3
F	+68	+63	+ 9	+ 6	−4
Cl	+31	+32	+11	+10	−4
Br	+20	+25	+11	+10	−3
I	− 6	+ 4	+11	+12	−1

^{13}C Shifts for some linear and branched chain alkanes

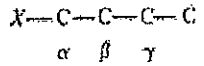
Compound	C-1	C-2	C-3	C-4	C-5
Methane	−2.3				
Ethane	5.7				
Propane	15.8	16.3	15.8		
Butane	13.4	25.2	25.2		
Pentane	13.9	22.8	34.7	22.8	13.9
Hexane	14.1	23.1	32.2	32.2	23.1
Heptane	14.1	23.2	32.6	29.7	32.6
Octane	14.2	23.2	32.6	29.9	29.9
Nonane	14.2	23.3	32.6	30.0	30.3
Decane	14.2	23.2	32.6	31.1	30.5
Isobutane	24.5	25.4			
Isopentane	22.2	31.1	32.0	11.7	
Isohexane	22.7	28.0	42.0	20.9	14.3
Neopentane	31.7	28.1			
2,2-Dimethylbutane	29.1	30.6	36.9	8.9	
3-Methylpentane	11.5	29.5	36.9	(18.8, 3-CH_3)	
2,3-Dimethylbutane	19.5	34.3			
2,2,3-Trimethylbutane	27.4	33.1	38.3	16.1	
2,3-Dimethylpentane	7.0	25.3	36.3	(14.6, 3-CH_3)	

(P.T.O.)

^{13}C shifts for substituted benzenes
Base value for benzene is 128.5 ppm

Substituent	C-1 (Attachment)	C-2	C-3	C-4	C of Substituent (ppm from TMS)
H	0.0	0.0	0.0	0.0	
CH_3	+9.3	+0.7	−0.1	−2.9	21.3
CH_2CH_3	+15.6	−0.5	0.0	−2.6	29.2 (CH_2), 15.8 (CH_3)
$CH(CH_3)_2$	+20.1	−2.0	0.0	−2.5	34.4 (CH), 24.1 (CH_3)
$C(CH_3)_3$	+22.2	−3.4	−0.4	−3.1	34.5 (C), 31.4 (CH_3)
$CH{=}CH_2$	+9.1	−2.4	+0.2	−0.5	137.1 (CH), 113.5 (CH_2)
$C{\equiv}CH$	−5.8	+6.9	+0.1	+0.4	84.0 (C), 77.8 (CH)
C_2H_5	+12.1	−1.8	−0.1	−1.6	
CH_2OH	+13.3	−0.8	−0.6	−0.4	64.5
CH_2OCCH_3 (O)	+7.7	−0.0	−0.0	−0.0	20.7 (CH_3), 66.1 (CH_2), 170.5 (C=O)
OH	+26.6	−12.7	+1.6	−7.3	
OCH_3	+31.4	−14.4	+1.0	−7.7	54.1
OC_2H_5	+29.0	−9.4	+1.6	−5.3	
$OCCH_3$ (O)	+22.4	−7.1	−0.4	−3.2	23.9 (CH_3), 169.7 (C=O)
CH (O)	+8.2	+1.2	+0.6	+5.8	192.0
CCH_3 (O)	+7.8	−0.4	−0.4	+2.8	24.6 (CH_3), 195.7 (C=O)
CC_2H_5 (O)	+9.1	+1.5	−0.2	+3.8	196.4 (C=O)
CF_3 (O)	−5.6	+1.8	+0.7	+6.7	
COH (O)	+2.9	+1.3	+0.4	+4.3	168.0
$COCH_3$ (O)	+2.0	+1.2	−0.1	+4.8	51.0 (CH_3), 166.8 (C=O) 168.5
COCl (O)	+4.6	+2.9	+0.6	+7.0	
CNH_2 (O)	+5.0	−1.2	0.0	+3.4	
$C{\equiv}N$	−16.0	+3.6	+0.6	+4.3	119.5
NH_2	+19.2	−12.4	+1.3	−9.5	
$N(CH_3)_2$	+22.4	−15.7	+0.8	−11.8	40.3
$NHCCH_3$ (O)	+11.1	−9.9	+0.2	−5.6	
NO_2	+19.6	−5.3	+0.9	+6.0	
$N{=}C{=}O$	+5.7	−3.6	+1.2	−2.8	129.5
F	+35.1	−14.3	+0.9	−4.5	
Cl	+6.4	+0.2	+1.0	−2.0	
Br	−5.4	+3.4	+2.2	−1.0	
I	−32.2	+9.9	+2.6	−7.3	
CF_3	+2.6	−3.1	+0.4	+3.4	
SH	+2.3	+0.6	+0.2	−3.3	
SCH_3	+10.2	−1.8	+0.4	−3.6	15.9
SO_2NH_2	+15.3	−2.9	+0.4	+3.3	
$Si(CH_3)_3$	+13.4	+4.4	−1.1	−1.1	

Influence of functional group X on the chemical shift position (δ) of nearby carbons in alkane chains[a]

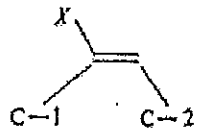


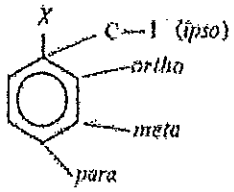
X	α-shift: $X-CH_3-$ (1°)	α-shift: $X-CH(R)-$ (2°)	α-shift: $X-C(R)_2-$ (3°)	β-shift	γ-shift
$-CH_3$	9	6	3	9	−3
—R: see table 3.11					
axial $-CH_3$	1	–	–	5	−6
equatorial $-CH_3$ (in cyclohexanes)	6	–	–	9	0
$-CH=CH_2$	22	16	12	7	−2
$-C\equiv CH$	4	–	–	3	−3
$-C_6H_5$, —Ar	23	17	11	10	−3
—F	70	–	–	8	−7
—Cl	31	35	42	10	−5
—Br	19	28	37	11	−4
—I	−7 to 20	–	–	11	−2
$-NH_2$, —NHR, $-NR_2$	29	24	18	11	−4
$-NO_2$	62	–	–	3	−5
—NHCOR, —NRCOR	10	–	–	0	0
$-NH_3^+$	25	–	–	7	−3
—CN	3	4	–	2	−3
—SH	2	–	–	2	−2
—OH	50	45	40	9	−3
—OR	50	24	17	10	−6
—OCOR	52	50	45	7	−6
—COOH, —COOR, —CON<	20	16	13	2	−3
—COR, —CHO	30	24	17	2	−3
$-SO_3H$, $-SO_2N<$	50	–	–	3	0

(P.T.O.)

Influence of functional group X on the chemical shift positions (δ) of nearby carbons in alkene groups and benzene rings

Base values: ethylene (δ 123) and benzene (δ 128)





	Alkenes		Benzenes			
	C—1	C—2	C—1 (*ipso*)	*ortho*	*meta*	*para*
—CH_3	10	−8	9	0	0	−2
R, 	16	−8	15	0	0	−2
R, 	23	−8	21	0	0	−2
—CH=CH_2	15	−6	9	0	0	−2
—C≡CH	—	—	−6	4	0	0
—C_6H_5, —Ar	13	−11	13	−1	1	−1
—F	25	−34	35	−14	1	−5
—Cl	3	−6	6	0	1	−2
—Br	−8	−1	−5	3	2	−2
—I	−38	7	−32	10	3	−1
—NH_2	—	—	18	−13	1	−10
—NHR	—	—	20	−14	1	−10
—NR_2	—	—	22	−16	1	−10
—NO_2	22	−1	20	−5	1	6
—NHCOR, —NRCOR	—	—	10	−7	1	−4
—CN	−15	15	−16	4	1	6
—SH	—	—	4	1	1	−3
—OH	—	—	27	−13	1	−7
—OR	29	−39	30	−15	1	−8
—OCOR	18	−27	23	−6	1	−2
—COOH, —COOR, —CON<	4	9	2	2	0	5
—COR, —CHO	14	13	9	1	1	6
—SO_3H, —SO_2N<	—	—	16	0	0	4
—PMe_2	—	—	14	1.6	0	−1
—PAr_2	—	—	9	5	0	0

SC

SEAT No._____

No. Of Pages: 02

[42PA-21]

SARDAR PATEL UNIVERSITY

M. Sc. –Semester-IV (Organic Chemistry)

PS04CORC02-Natural Products

Monday, 6th November, 2017

Time: 02:00 p.m. to 5:00 p.m. **Marks: 70**

Q. 1 Answer the following multiple choice question. **[8]**

1. _____ is used to determine Methoxy group presence in Alkaloids.
   (a) Herzing Mayer Method (c) Von braun Method
   (b) Zeisel's Method (d) Hofmann Exhaustive Methylation
2. _____ of the following is male sex hormone.
   (a) Oestron (c) Cortison
   (b) Gastrogen (d) Adrogens
3. Ozonolysis of vitamin A1 produce _____.
   (a) Geronic Acid (c) Acetic acid
   (b) Lactic acid (d) Pyromellitic acid
4. The reagent used in Kohn-Roth methyl side chain determination is _____
   (a) Cromiumtrioxide in sulfuric acid (c) Selenium dioxide
   (b) Nitric acid (d) Lead tetraactate
5. _____of the following vitamins contain Ureid nucleus.
   (a) Vitamin-H (c) Vitamin-B_1
   (b) Vitamin B_6 (d) Vitamin-A
6. Basic Nucleus Parent ring in Morphine is_____
   (a) Quinoline (c) Carbazole
   (b) Phenanthrene (d) Azulene
7. _____ is molecular formula of tetrahydro cadinene.
   (a) $C_{15}H_{28}$ (c) $C_{15}H_{24}$
   (b) $C_{14}H_{30}$ (d) $C_{15}H_{26}$
8. Number of carbon atom present in triterpenoid is _____
   (a) 10 (c) 15
   (b) 20 (d) 30

Q. 2. Explain the following. (Any Seven) **[14]**

1. What is isoprene rule.
2. Explain the β-Eudesmol is bicyclic compound.
3. Give the classification of terpenoids basis on carbon atoms.
4. Discuss the color test of cholesterol.
5. Write a Blanc's rule.
6. Write the properties of alkaloids.
7. Describe two general methods of isolation of products from natural resources.
8. How morphine, codeine and thebaine are related to each other. Write their structures.
9. Explain the biochemical function of vitamin A_1

Q. 3. A. Write Short note on Vitamin B_6. [6]

B. Write a synthesis of Reserpine . [6]

OR

B. Define vitamins and classify them. Write sources and deficiency diseases of Vitamin H and discuss its structure. [6]

Q. 4. A. Give the synthesis of Morphine. [6]

B. Discuss the proton NMR spectral data for alkaloid Mahanimbine. [6]

OR

B. Give the acid catalyzed conversion of thebain to thebanine . [6]

Q. 5. A. Write a note on Campbell and Soffer's work for position of double bond in Cadinene. [6]

B. Write a synthesis of Caryophyllene. [6]

OR

B. Answer the following.

(i) Give the evidence for methyl groups in side chain of β-carotene. [3]

(ii) Discuss the Kahn-Roth oxidation study of β-carotene . [3]

Q. 6. A. Give the evidence for position of angular methyl group in cholesterol. [6]

B. Give the synthesis of cholesterol. [6]

OR

B. Give the classification of steroid hormones and synthesized any two Steroid hormones. [6]

—X—

SC

(116 & A-59) SEAT No._____

No of printed pages: 02

SARDAR PATEL UNIVERSITY

M.Sc. Semester-IV (Organic Chemistry) Examination (CBCS) (CNC)

Wednesday, 8th November- 2017

PS04CORCO3-Sterechemistry of Organic Compounds

Time: 2:00pm to 05:00pm **Total Marks: 70**

Q.1 **Select the correct answer.** **08**

1 In the axial haloketone rule, Vertical plane 'A' passing through Carbone number.....

(i) 3 (ii) 2 & 3

(iii) 3 & 5 (iv) 1 & 4

2 Which reagent is useful in the Shrapless Epoxidation reaction?

(i) CH_2Cl_2 (ii) t-BuooH

(iii) $Ti(OiPr)_4$ (iv) Above All

3 The CD and ORD spectrum provide important information regarding the secondary structures of

(i) DNA (ii) RNA

(iii) Proteins (iv) Above all

4 In Prelog's rule, the group attached to the stereocenter is...

(i) Medium (ii) Large

(iii) Small (iv) Above All

5 The basic characteristic must required for resolving agent is.....

(i) Unstable (ii) High Molecular weight

(iii) High toxicity (iv) Pure form

6 Absolute chiral synthesis involve the formation of ..... compound.

(i) Resolving agents (ii) Optically inactive

(iii) Optically active (iv) None of these

7 Non bonding MO will be absent in...

(i) Allyl Cation (ii) 1,3-Butadiene

(iii) Allyl anion (iv) 2,4-Pentadienyl Cation

8 Resolution through kinetic asymmetric transformation , thermodynamically controlled condition is given by ...

(i) $\Delta G = - RT \ln p/n$ (ii) $\Delta G = - RT \ln n/p$

(iii) $\Delta G^* = - RT \ln p^*/n^*$ (iv) $\Delta G^* = - RT \ln n^*/p^*$

(P.T.O.)

Q.2 **Answer the following(Any Seven)** 14

1 Define the terms: (i) Enantiomer (ii) Resolution
2 Explain the "Racemic Mixture".
3 State the Cram's Rule.
4 Give the mechanism for the generation of first chiral center.
5 Draw the structure of bicyclo [2.2.2] Octane.
6 Discuss the Resolution of Aldehyde and ketone .
7 Discuss the Chiral Synthesis in biochemical system.
8 Define the terms HOMO and LUMO.
9 State cotton effect with example.

Q.3 A Write note on: 6
(A) Wilkinson catalysts
(B) Sharpless epoxidation

B Write note on: 6
(A) Preferential crystallization.
(B) SMB Technique

OR

B Write note on: Experimental procedure for resolution of (±) 2-Octanal.

Q.4 A Draw the all conformers and potential energy diagram of n-butane 6

B Draw the conformations of Cyclohexane and Cyclononane in monocyclic compound. 6

OR

B Define the term conformers. Draw the diastereomers of 2, 3-butane diols and Discuss the important points.

Q.5 A Discuss the [2+2] Cycloaddition Reaction. 6

B Write a note on: Sigmatropic Rearrangement. 6

OR

B Write note on: Frontier Molecular Orbital Approach in Electrocyclic Reactions.

Q.6 A Draw the Structure of DNA's and discuss in detail. 6

B Write short notes on ORD & CD. 6

OR

B Draw the Structure of Enzyme and discuss in detail.

****

—X—

(2)

(115&A-49) SEAT No._____ No of printed pages: 03

SARDAR PATEL UNIVERSITY

M.Sc. Chemistry (IV Semester) Examination

Friday, 10th November 2017

Medicinal chemistry (PS04ECHE01)

N.B. 1) Figures to right indicates full marks **Total Marks: 70**
2) Attempt all questions **Time : 2.00 pm to 5.00 pm**

Q. 1 : Answer the following multiple choice questions. **[08]**

a) Drug can enter into CNS if they are -------

i) low particle size drugs i) Lipid soluble drugs

ii) Non- Lipid soluble drugs iv) None of these

b) Pharmacokinetic consideration do not determine ---

i) Time of peak action ii) Cytotoxicity of drug

iii) Route of administration iv) Frequency of administration of drug

c) Which of the following are acts as a chemical messenger?

i) Neurotransmeter ii) Harmones iii) Proteins iv) i and ii

d) Receptors are usually-------

i) DNA ii) RNA iii) Proteins iv) Lipids

e) Hypertension is mainly caused by -----

i) Genetic factor ii) Kidney diseases iii) Excesses of alcohol iv) All

f) The main function of vasodilators is to ---------- blood vessels.

i) Chock up ii) Cure iii) Dilate iv) Block

g) ---------- drugs have direct action on malignant tumor.

i) Cardiovascular ii) Psychoactive iii) Antineoplastic iv) Antithyroid

h) Which of the following is from Antibiotic class?

i) Chloramphenicol ii) Carmustine iii) Chlorambucil iv) None

(P.T.O.)

Q.2. : Answer the following. (Any seven) **[14]**

1) Define the term Toxicology and pharmacodynamics.

2) Write the difference between benign tumor and Malignant tumor.

3) Write a note on Angina Pectoris.

4) Write the therapeutic applications of Melphalan.

5) Define Prodrug. List the advantages of Prodrug over active drugs.

6) Discuss the different processes for drug elimination.

7) Explain the mode of action of β-lactum.

8) Define: Agonist. Write the types of Agonist.

9) Write a note on Antidepressant agent.

Q.3 : A) Discuss in brief various routes of drug administration. **[06]**

B) Answer the following. **[06]**

i) Write a note on plateau effect.

ii) Explain the drug distribution and drug metabolism in brief.

OR

B) Explain the pharmacokinetics in terms of first order & zero order. **[06]**

Q.4 : A) Define chemical messengers and explain signaling through hormones. **[06]**

B) Explain Channel linked, enzyme linked and intracellular receptors in detail. **[06]**

OR

B) Answer the following. **[06]**

i) Explain the binding sites and their characteristics properties.

ii) Write a note on antagonist.

Q.5 : A) Write the classification of general Anesthetics and discuss the different stages of anesthesia. **[06]**

B) Explain antihypertensive drugs with their classification. **[06]**

OR

C) Give the synthesis of following drugs. **[06]**

i) Diazepam ii) Chloropromazine iii) Haloperidol.

Q.6 : A) Write the various chemotherapeutic agents used in treatment of cancer and Explain any one of them in detail. **[06]**

B) Explain the term antibiotics with their classification. Discuss the mode of action of penicillin drug. **[06]**

OR

B) Give the synthesis and applications of the following drugs. **[06]**

i) Chloramphenicol

ii) Amoxicillin.

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