AIKTC/KRRC/SoP/ACKN/QUES/2019-20/ **Date:** 15/01/2020

School: SoP-CBCS **Branch:** SoP **SEM:** III

To,
Exam Controller,
AIKTC, New Panvel.

Dear Sir/Madam,

Received with thanks the following **Semester/Periodic** (Regular) question papers from your exam cell:

Sr. No.	Subject Name	Subject Code	Format		No. of Copies
			SC	HC	
1	Organic Chemistry I	BPH_C_301_T		✓	02
2	Physical Pharmacy I	BPH_C_302_T		✓	02
3	Anatomy, Physiology & Pathophysiology III	BPH_C_303_T		✓	02
4	Pharmaceutical Analysis I	BPH_C_304_T		✓	02
5	Pharmaceutical Engineering	BPH_C_305_T		✓	02

Note: SC – Softcopy, HC - Hardcopy

(Shaheen Ansari)
Librarian, AIKTC

110

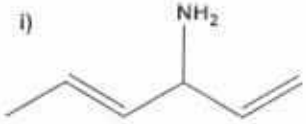
SE-sem-III – Choic Based (SY)

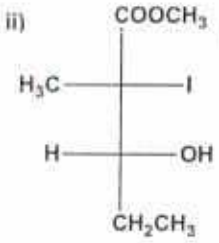
3/12/19

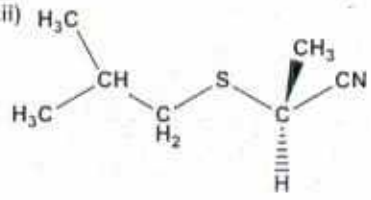
(3 Hours) [Total Marks: 80]

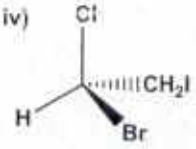
N.B.: 1. All questions are compulsory
2. Answer all sub questions together

Q.1 a) Assign R/ S, E/Z or D/L notations and nomenclate the following as per IUPAC rule. **[4M]**

i) 

ii) 

iii) 

iv) 

b) Give suitable structures for the following compounds. **[4M]**

i. E-1,2-Dicyclopentylethene
ii. Pent-3-yn-1-al
iii. 5-Formyl-3-bromopentanamide
iv. 1R-1-Phenyl-3-oxabutanol

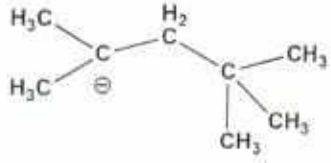
c) Answer the following questions **(ANY SIX)** **[12M]**

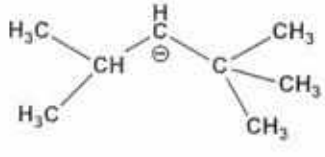
i. Draw and identify the HOMO and LUMO of Acetaldehyde.
ii. Draw resonating structure of the following molecules:
A] Nitrobenzene B] Anisole
iii. Represent 2R,3S-2,4-Dihydroxy-3-nitrobutanal using Fischer and Newman projection formulae.
iv. Establish relationship between following pair of molecules:

v. Arrange the following in increasing order of acidity and justify:
Propanoic acid, Propynoic acid, Propenoic acid
vi. Which of the following behaves as electrophiles or nucleophiles?

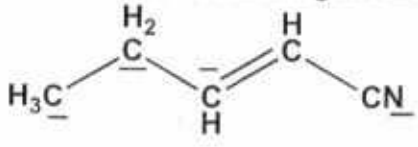
A] $AlCl_3$ B] CH_3OH C] $+NO_2$ D] $CH_2=CH_2$

vii. Which of the following structure is more stable and Why?

A] 

B] 

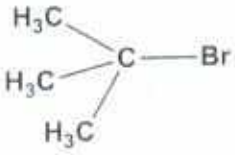
Q.2. a) Draw the molecular orbital energy diagram for ethene & Label the orbitals. **[2M]**
b) Identify the hybridization state of the underlined atom in the given molecule. **[2M]**

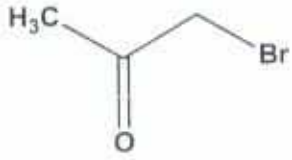


c) Depict energy profile diagram for the hydrolysis of esters in basic solution. Identify the intermediate and state whether the whole reaction will be endothermic or exothermic? [4M]

d) i. Give suitable explanation for the statement 'Polar aprotic solvent is used in SN_2 reaction'. [2M]

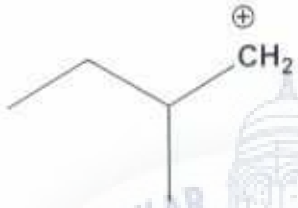
ii. Identify the hydrolysis pathway for the following with proper justification: [2M]

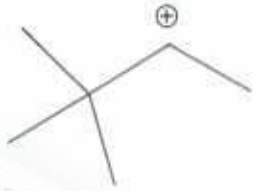
A 

B 

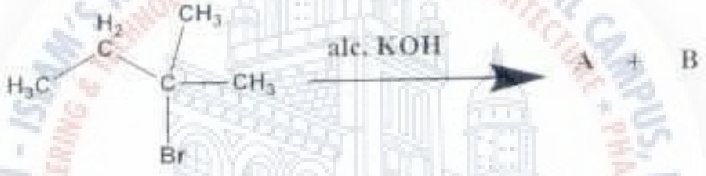
Q.3. a) Discuss Pitzer strain with suitable examples. [2M]

b) Give stable active intermediates which can be obtained on intramolecular shifts for following given moieties and cite reason for their stability [2M]

A 

B 

c) Complete the reaction and discuss the mechanism with suitable evidence for the same [4M]



d) Write a note on bromination of trans-2-butene and comment on the stereochemistry of the product. [4M]

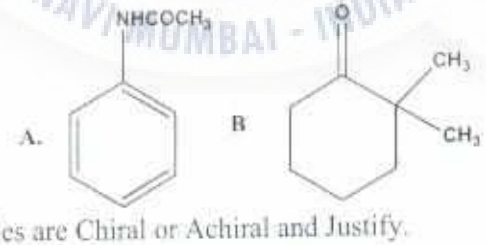
Q.4. a) i. Which of the following is expected to exhibit H-bonding and Why? Justify. [2M]

A. Ethanol B. Acetic acid

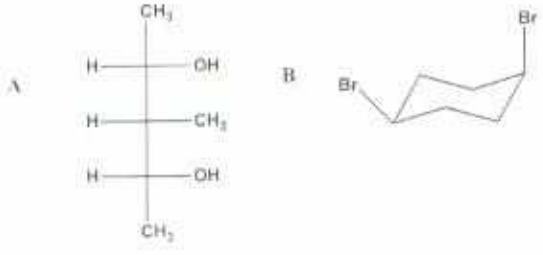
ii. On the basis of lipid solubility justify increasing order of logP for the following compounds: [2M]

Phenol (logP = 1.5), Benzene (logP = 2.1), Fluorobenzene (logP = 2.27)

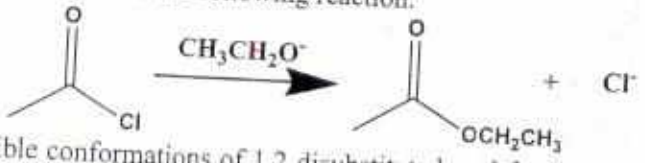
b) Identify tautomeric system existing in the following: [2M]



c) Identify whether given molecules are Chiral or Achiral and Justify. [2M]



d) Comment on kinetics of the following reaction. What is the difference between Transition State and Intermediate explain with respect to the following reaction: [4M]



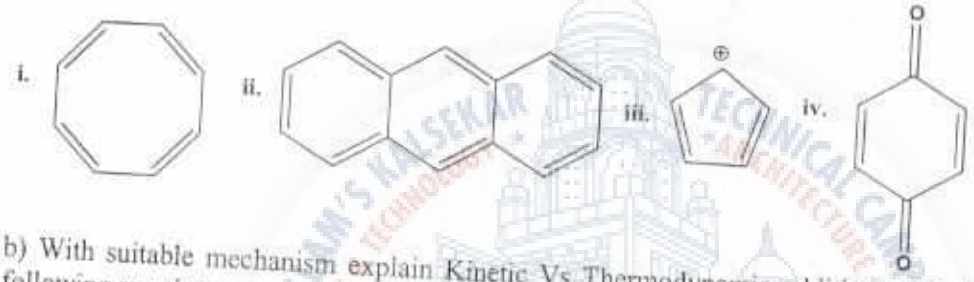
Q.5. a) Depict all possible conformations of 1,2-disubstituted cyclohexane. Comment on their optical activity as well as stability. [4M]

b) i. Arrange the following in increasing order of basicity and justify: [2M]
Aniline, Cyclohexylamine, Ammonia

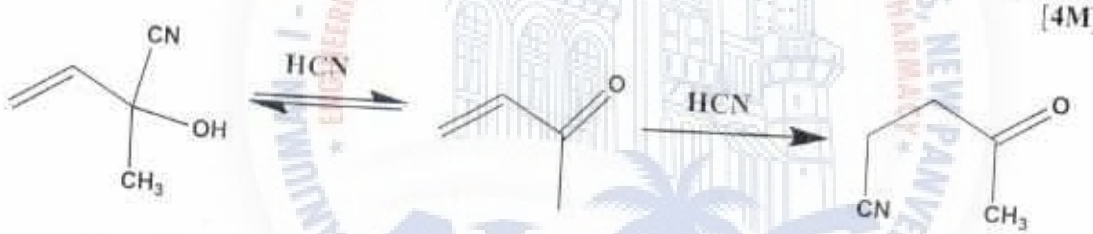
ii. Explain with justification the difference in pKa values for cis-butenedioic acid ($pKa^1 = 1.92$) and trans-butenedioic acid ($pKa^1 = 3.02$) [2M]

c) With suitable examples explain Dipole-dipole and Van der Waal interactions. Compare binding of an ester functional group and an ether functional group with the receptor. [4M]

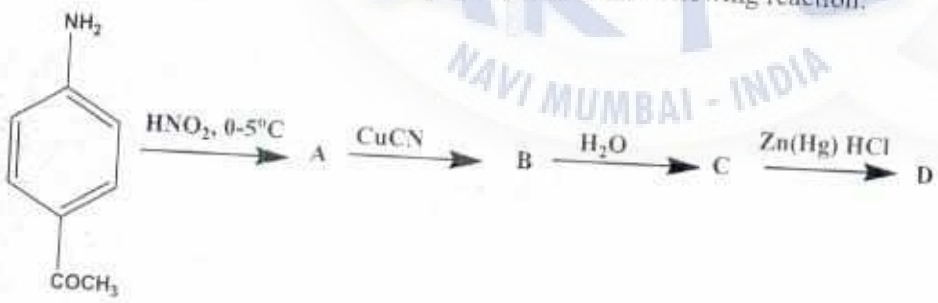
Q.6. a) Identify the given molecules are aromatic, nonaromatic or antiaromatic: [4M]



b) With suitable mechanism explain Kinetic Vs Thermodynamic addition product formation in the following reaction: [4M]



c) Identify and draw structures of A, B, C and D in the following reaction: [4M]



SEM-II CBCS 11/12/19 Q. P. Code: 33959

[Time: 3 hours] [Marks 80]

NB: 1. All questions are compulsory
2. Figures to the right indicate full marks

1 a.	Enlist different intermolecular attractive forces.	2
b.	Define the terms latent heat of vaporization and vapor pressure	2
c.	Define with examples colligative and constitutive properties	2
d.	State phase rule giving example of a two component system.	2
e.	Explain the effect of pressure on solubility of gases in liquids	2
f.	Derive an expression for dissociate constant of acetic acid.	2
g.	Calculate the pH of; i) 0.01 M NaOH and, ii) 0.001 M H_2SO_4	2
h.	Define the terms surface tension and surface free energy.	2
i.	What is contact angle? State its relationship with wetting of a solid.	2
j.	Explain the terms reduced viscosity and viscoelasticity	2
2a.	What are real gases? State and explain Van der Waal's equation for real gases. Calculate the pressure developed in a 5L vessel containing 2 moles of carbon dioxide at 27 ^{0}C. Assume the gas to behave as real gas. (Given R = 0.0821 atm L K^{-1} mol^{-1})	4
b.	What are isotonic solutions? Explain class I methods to adjust tonicity.	4
c.	Define critical solution temperature. Explain any system exhibiting critical solution temperature.	4
3a.	What is optical rotation? Enlist the applications of determination of optical rotation and explain the working of polarimeter.	4
b.	Explain Sorensen's pH scale and elaborate on buffer action.	4
c.	Give the applications of spreading coefficient. Calculate the HLB of a surfactant having saponification value of 161 and acid value of 198.	4
4a.	Define Raoult's law and explain deviations to Raoult's law. **OR** Differentiate between ideal and real solutions and explain azeotropic mixtures in detail.	4
b.	Comment on the solubility of solids in liquids giving emphasis on solubility parameters.	4
c.	What are acidic buffers? Derive Henderson Hasselbalch equation for acidic buffers.	4
5a.	Distinguish between amorphous and crystalline solids. Explain the term polymorphism with suitable example.	4
b.	Define adsorption. Derive equation for Langmuir adsorption isotherm.	4
c.	What are non-newtonian systems? Differentiate between plastic and pseudoplastic flow. **OR** Explain the term thixotropy and state its significance.	4

6a.	Write a note on liquid crystalline state.	4
b.	Define surface tension. Explain drop weight **OR** drop number method to determine surface tension.	4
c.	Enlist methods to measure flow of Newtonian and non-newtonian systems. Explain any one method for determination of viscosity of Newtonian liquids.	4

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Sem - III CBCS 13/12/19

(3 Hours) [Total marks 80]

N.B. : (1) **All** questions are **Compulsory**
(2) Answer **all** sub questions **together.**
(3) Draw neat labeled diagram wherever necessary.

Q.1A) Answer the following 16M

i. What is the role of chemoreceptor in the regulation of blood pressure?
ii. Enlist factors that affect regulation of stroke volume.
iii. Draw neat labeled diagram of Sperm.
iv. What is salivation?
v. Explain Mean arterial pressure (MAP).
vi. Explain functions of Pancreatic juice.
vii. Enlist Layers of uterus.
Viii. Explain cephalic phases of digestion.

Q.1B) Answer the following 4M

1.Rapid ventricular depolarization	A. 10mmHg
2.Angiotensin II	B. 4.6 ~ 8.0
3.Net filtration pressure	C. Increase reabsorption of Na^+ and water
4.pH of normal urine	D. QRS complex

Q.2 A) Answer <u>any **TWO**</u> of the following 8M

i. Explain Anatomy of heart with well labeled diagram.
ii. Explain the conduction system of heart.
iii. Explain in detail hormonal regulation of blood pressure.

Q.2 B) Answer <u>any **ONE**</u> of the following 4M

i. Write a short note on Ischemic heart disease.
ii. Explain "Action Potential" of Heart muscle.

Q.3 A) Answer <u>any **TWO**</u> of the following 8M

i. Discuss in detail three phases of deglutition.
ii. Draw a neat labeled diagram of internal and external anatomy of stomach.
iii. Describe the mechanical movements that occur in the large intestine.

Q.3 B) Answer <u>any **ONE**</u> of the following 4M

i. Write note on Digetion of carbohydrates.
ii. Write a note on Reflux esophagitis.

Q.4 A) Answer any **TWO** of the following 8M

i. Discuss the process of Dilute Urine formation.
ii. Draw a neat labeled diagram of nephron and discuss reabsorption in nephron loop.
iii. explain glomerular filtration of urine.

Q.4 B) Answer any **ONE** of the following 4M

i. Explain renin-angiotensin-aldosterone system.
ii. Write a note on Urinary tract infections.

Q.5 A) Answer any **TWO** of the following 8M

i. Describe anatomy and functions of Male reproductive system.
ii. Explain stages of oogenesis.
iii. Draw neat labeled diagram of testis.

Q.5 B) Answer any **ONE** of the following 4M

i. Write a short note on STD.
ii. Write a short note on Dysmenorrhea.

Q.6 A) Answer any **TWO** of the following 8M

i. Explain in detail different types of acid-base imbalances.
ii. Discuss functions and regulation of electrolyte in body fluids.
iii. Explain events of spermatogenesis.

Q.6 B) Answer any **ONE** of the following 4M

i. Describe the structure and functions of the layers of GI tract.
ii. Write a note on fluid compartments and fluid balance.

Sem-III CBCS 17/12/19

Q.P. Code: 33801

3 Hours **(Total marks: 80)**

N.B. 1. All questions are compulsory
2. Figures to right indicate full marks.
3. Draw neat labelled diagrams wherever necessary.
4. Attempt answer of each main question on new page.

Q.1 A. Explain the following terms (any eight): **(8)**

i. End point of a titration
ii. Normality
iii. Blank determination
iv. Iodometry
v. Fractional Precipitation
vi. Reducing agent
vii. Distribution coefficient
viii. Half wave potential
ix. Monograph
x. Decomposition potential

B. Answer the following questions: **(12)**

i. State Faraday's law of electrolysis.
ii. Balance the following reactions:
$Fe^{2+} + MnO^{4-} \longrightarrow Fe^{3+} + Mn^{2+}$
iii. Calculate the pOH of a solution containing 0.0001M/lt of H^+.
iv. The ether-water partition coefficient for drug A is 4. 20mL aliquot of its solution was extracted with 10mL of ether. Calculate the percentage of drug found in both the layers.
v. Give the principle behind assay of benzoic acid or urea.
vi. Name two indicators used in complexometry.

Q. 2 A. i. Explain levelling and differentiating effect using a suitable example. **(2)**
ii. Give the principle behind assay of sodium benzoate. **(2)**

B. Write a note on dropping mercury electrode. **(4)**

OR

B. Write a note on Karl Fischer titration.

C. Differentiate between Mohr's and Volhard's method for estimation of halides. **(4)**

Q. 3 A. Give the principle, chemical reactions and indicator involved in the assay of soluble aspirin tablets. **(4)**

B. Name the titrant and indicator used for the following assays: **(4)**

i. Ferrous sulphate
ii. Hydrogen peroxide

C. Write a note on pulse polarography. Give the applications of polarography. **(4)**

Q. 4 A. Depict the neutralization curve obtained for the following titrations: **(4)**

i. 0.1N HCl with 0.1N NaOH
ii. 0.1N NH_4OH with 0.1N HCl

Suggest suitable indicators for the above titrations giving their pH range.

B. Write a note on iodate titrations. **(4)**

C. Enlist unit operations in gravimetry and explain the step of washing in detail. **(4)**

Q. 5 A. State and explain the types of errors. **(4)**

B. Give the principle and reactions involved in estimation of zinc and magnesium in a mixture. **(4)**

C. Write a note on counter current distribution. **(4)**

Q. 6 A. An aqueous solution of KOH (mol. Wt. of KOH=56.1) was prepared by dissolving 38.05 gm in 1lt. Calculate the following: **(4)**

i. Its %w/v
ii. Molarity
iii. How will you prepare a 100ml of 0.05N solution of KOH from the above given solution?
iv. Its pH

B. Explain, in detail, a method used for determination of organically bound halogens. **(4)**

OR

Write a note on nitrite titrations.

C. Give a method of gravimetric estimation of Ba^{2+}. Calculate gravimetric factor involved in this reaction. **(4)**
(Atomic weight of Ba: 137.3, O: 16, S: 32)

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SEM - II CBCS 19/12/19

(3 hours) [TOTAL MARKS: 80]

N.B. 1) All questions are compulsory
2) Draw neat and labeled diagrams wherever necessary

Q1. a) Classify manometers and write a note on Bourdon Gauge 3
b) Elaborate on mass transfer in turbulent and laminar flow 3
c) Discuss any two factors affecting caking of crystals 2
d) Explain how scale formation affects rate of evaporation 2
e) Draw neat and labeled diagram of simple distillation assembly 2
f) Write a note on Copper and its alloys 3
g) Give differences between Crystal form and Crystal habit 2
h) Describe in brief condensers as evaporator accessories 3

Q2. a) Explain briefly the principle and working of Rotary pump. 4
b) Discuss the design and working of Swenson walker Crystalliser 4

OR

b) Explain design and working of Vacuum Crystallizer
c) Give an account of Azeotropic Distillation 4

Q3. a) Classify flowmeters and Explain design and working of Rotameter 4

OR

a) Elaborate on construction and working of Pitot tube
b) Outline the working of Vacuum pumps as evaporator accessories 4
c) Define refrigeration and describe any one type of refrigeration equipment 4

Q4. a) Explain fluid properties such as viscosity, compressibility and surface tension of fluids 4
b) Describe in detail Tubular Heat exchangers 4

OR

b) Write a note on any one temperature measurement device.
c) Discuss in detail Mier's theory of supersaturation 4

Q5. a) Write a note on Centrifugal pumps 4
b) Explain HETP and elaborate on Bubble cap plate columns 4

OR

b) Give an account of principle and working of Fractional distillation equipment
c) Write a note on Electrical hazards and their prevention in Pharmaceutical Industry 4

Q6. a) Elaborate in detail on Belt conveyers for transportation of solids 4
b) Describe design and working of Forced circulation Evaporator 4
c) Discuss in detail any two factors influencing rate of corrosion 4

OR

c) Enlist methods to combat corrosion and explain any one in detail

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