

Sem III CBBS  
Dec 17 (Reg)

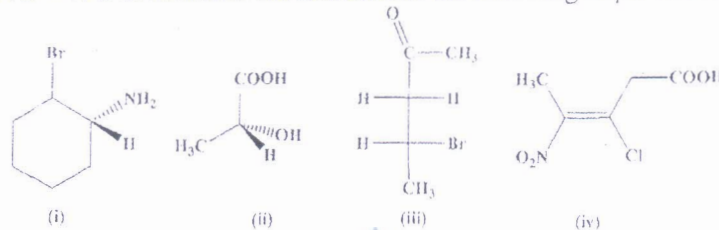
(3 Hours)

Q.P.Code: 27660

Total Marks: 80

- N.B.: 1. All questions are compulsory  
2. Answer all subquestions together  
3. Figures to right indicate full marks

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



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

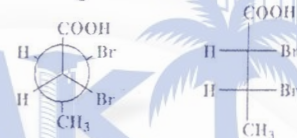
- (Z)-3-chlorohex-3-en-1-yne
- (S)-Ethyl 4-cyano-3-oxopentanoate
- 3-nitrocyclohex-2,5-dienoic acid
- 3-cyclopropyl-1-butene

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

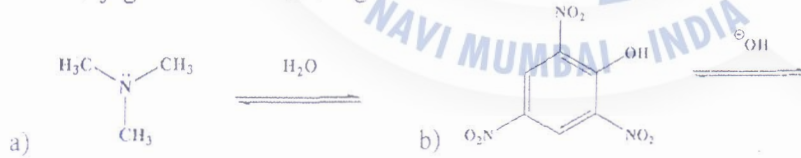
- Draw and identify the HOMO and LUMO of Acetone.
- Draw resonating structure of the following molecules



- Represent 2(R)-2-Hydroxypropanoic acid using Fischer and Newman projection formulae.
- Identify the relationship between following chiral structures



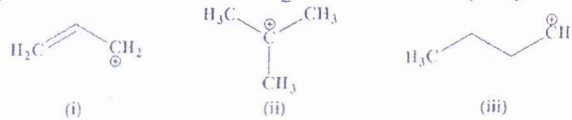
v. Write conjugate acid/base of the given reactions.



vi. Identify the electrophiles and nucleophiles in the given reaction.

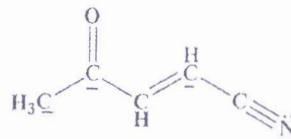


vii. Arrange the following carbocations in increasing order of stability & justify the same.



Q.2. i. Draw the molecular orbital energy diagram for acetaldehyde & Label the orbitals. [2M]

ii. Identify the hybridization state of the underlined atom from the given molecule. [2M]



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iii. Complete the following table [4M]

Type of reaction	Order of reactivity of substrate (Alkyl halide)	Nucleophile	Type of solvent & Example of solvent	Stereochemistry
SN1				
SN2				

iv. Draw the energy profile diagram to depict the following reactions and identify the transition states, identify whether the reaction is endothermic or exothermic. [4M]



Q.3 i. Discuss Pitzer strain in cycloalkane [2M]

ii. Arrange the order of reactivity of following nucleophiles [2M]



iii. What is Hoffmann rule? Complete the following reaction and suggest the mechanism (E1/E2) [4M]



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

Q.4 i. Define Enthalpy. Comment on the  $\Delta G$ ,  $\Delta H$ ,  $\Delta S$  of the given reaction. [4M]



ii. Which one of the following pair is expected to exhibit H-bonding and why. Justify your answer Methanamine and Methanethiol [2M]

iii. On the basis of solubility, justify the increasing order of logP for the following compounds [2M]

Neopentyl alcohol (logP= 1.31), Neopentylbromide (logP=3.03), Neopentane (logP=3.11)

iv. Identify the best leaving group  $\text{TsO}^-$ ,  $\text{I}^-$ ,  $\text{OH}^-$  and justify. [2M]

v. Identify whether the given molecules are chiral or achiral and Justify. [2M]



Q.5 i. Arrange the following compounds in increasing order of acidity & Justify. [2M]

Benzoic acid, p-aminobenzoic acid, p-nitrobenzoic acid

ii. Arrange the following compounds in increasing order of basicity & Justify. [2M]

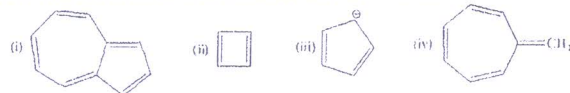
Aniline, Cyclohexylamine, N-methylaniline

iii. With the help of energy profile diagram draw various conformers of n-butane. Comment on their relative stability. [4M]

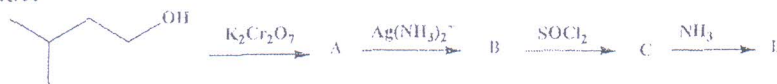
iv. Give the scheme for acid degradation/ base degradation of Paracetamol. [4M]

Q.6 i. Distinguish between the terms - intermediates and transition states giving suitable examples and support your answer by drawing energy profile diagram. [4M]

ii. Identify whether the given molecules are aromatic, nonaromatic or antiaromatic. [4M]



iii. Give the product [4M]



**Q.P. Code :27013**

[Time: Three Hours]

[ Marks:80]

Please check whether you have got the right question paper.

- N.B: 1) All questions are compulsory.  
2) Draw neat labelled diagrams wherever necessary.

- Q.1** a) Explain U-Tube manometer and its modification. (3)  
b) Define mass transfer. Elaborate on mass transfer in Laminar flow. (3)  
c) Define crystal form with example. (2)  
d) Classify Evaporator. (2)  
e) Explain the term HETP. (2)  
f) Write a note on Ferrous and its alloys. (3)  
g) Give limitation of Mier's theory of Supersaturation. (2)  
h) Elaborate bucket traps as an evaporator accessory. (3)

- Q.2** a) Classify Pump. Explain any one reciprocating pump in detail. (4)  
b) Discuss construction and working of Swenson Walker Crystallizer. (4)

OR

Explain design and working of Oslo Crystallizer.

- c) Discuss Centrifugal molecular distillation still. (4)

- Q.3** a) Classify flow meter. Elaborate orifice meter in detail. (4)

OR

Give the principle of variable area flow meter and explain Rotameter.

- b) Discuss construction and working of Horizontal tube evaporator. (4)

- c) Define refrigeration. Write in detail on refrigeration equipment. (4)

- Q.4** a) What is fluid dynamics? Write a note on Reynolds number. (4)

- b) What is conduction and discuss Stefan Boltzmann Law. (4)

OR

Enlist mode of heat transfer and write a note on any one tubular heat exchanger.

- c) Discuss nucleation step in crystallization. (4)

- Q.5** a) Describe principle construction and working of centrifugal pump. (4)

- b) Elaborate design and working of steam distillation. (4)

OR

Describe in detail construction and working Bubble Cap Plate column.

- c) Discuss types of fire and its prevention. (4)

- Q.6** a) Enlist types of conveyer and elaborate on Belt Conveyor. (4)

- b) Define evaporation and explain factor influencing rate of evaporation. (4)

- c) What is corrosion and discuss any two methods of prevention of corrosion. (4)

OR

Discuss mechanism and types of corrosion.

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QP CODE : 26212

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 terms: (8)

- i. Cerimetry
- ii. Permanganometry
- iii. Overvoltage
- iv. Electrogravimetry
- v. Ostwald's ripening
- vi. Sequestering agent
- vii. Molality
- viii. Primary standard

B. Answer the following questions: (12)

- i. Balance following reaction -  

$$\text{MnO}_4^- + \text{Fe}^{2+} \rightarrow \text{Mn}^{2+} + \text{Fe}^{3+}$$
- ii. How will you prepare 350ml solution of 0.95 N HCl from given one litre of 1.47N solution.
- iii. Give reasons:
  - a. Mohr' determination is carried out within a pH range of 6.5 to 9.
  - b. Mohr's method is not suitable for determination of iodides (I<sup>-</sup>) and thiocyanates (SCN<sup>-</sup>)
- iv. Calculate how much quantity of substance will remain in aqueous phase, if a single extraction of 1g solute having partition coefficient K=7 between chloroform and water is carried out with equal volumes (20ml) of each solvents.
- v. Name indicator and titrant used in - i. Assay of dried ferrous sulphate  
 ii. Assay of ascorbic acid API
- vi. State Faraday's laws of electrolysis.

Q.2 A. What is Aquametry? Write principle and reactions involved in Karl Fischer Titration. (4)

OR

Discuss in detail method used for determining organically bound halogens.

B. i. Explain differentiating and levelling effects exerted by solvents in non aqueous titration. (4)

ii. Complete the following table:

Compound	Titrant used in its assay	Indicator
Sodium benzoate		
Acetazolamide		

C. What is fractional precipitation? Discuss the estimation of halides using adsorption indicators. (4)

[TURN OVER

QP CODE : 26212

2

- Q.3 A. Write a note on normal pulse polarography and differential pulse polarography. (4)
- B. What is the difference between iodometric and iodimetric titration? Give the equations involved in the assay of potassium iodide. (4)
- C. Write principle, chemical reactions and end point determination involved in the assay of calcium gluconate injection or assay of aspirin API. (4)

- Q.4 A. Explain the neutralisation curve for titration of strong acid with strong base by taking suitable example. (4)
- B. What is gravimetry? Explain organic and inorganic precipitants with suitable examples and reactions. (4)
- C. Give the role of: (4)
- Sulphuric acid in permanganometry
  - Ferroun in cerimetry
  - Starch in iodimetry
  - Sodium thiosulphate in iodometry

- Q.5 A. A series of extract assays yielded the following values in terms of mg of total alkaloid per 100mL. (4)

33.40 mg	32.99 mg	33mg	31.95mg	32.35mg
33.5 mg	33.33mg	32mg	31mg	

Calculate mean, median, R.S.D and variance for the recorded values.

- B. Explain how pH is an important factor in complexometric titrations. Write structure and properties of EDTA as a complexing agent. (4)
- C. What is separatability factor? Write a note on counter current extraction. (4)
- Q.6 A. i. What volume of 1N H<sub>2</sub>SO<sub>4</sub> would be required to neutralize 60 ml of 1.256 N NaOH. (2)
- ii. How will you prepare 200 ml 0.25 N KMnO<sub>4</sub> solution. (mol.wt.158) (2)
- B. i. In Kjeldahl's estimation of an unknown compound, ammonia obtained from 0.99 g of an organic compound was received in 98 mL M/20 HCl, the residual acid in flask required 49 mL of M/20 NaOH for complete neutralization in back titration. What is the percentage of nitrogen in the compound? (2)
- ii. Explain end point determination using external indicator in assay of Sulphacetamide sodium. (2)
- C. i. Give reactions involved in assay of Nickel by dimethylglyoxime. (2)
- ii. Calculate gravimetric factor involved in gravimetric determination of sulphates as barium sulphate. (2)

[Atomic weights: C:12, H:1, O:16, N:14, Ba: 137.33 , S:32]

1st half 2017, 13/12/17

Q. P. Code: 27857

(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. Enlist heart valves.
- ii. Explain Stroke volume.
- iii. Differentiate between cortical and juxtamedullary nephrons.
- iv. Write down composition and functions of saliva.
- v. Give three basic processes of nephron.
- vi. Enlist phases of female reproductive cycle
- vii. Enlist vital functions of liver and gallbladder
- Viii. Explain cephalic phase of digestion.

Q.1B) Answer the following 4M

- i. The membrane that surrounds and protects the heart is \_\_\_\_\_.
- ii. \_\_\_\_\_ involves the maturation of spermatids into sperm.
- iii. \_\_\_\_\_ prevents filtration of blood cells but allows all components of blood plasma to pass through filtration membrane.
- iv. The \_\_\_\_\_ consists of areolar connective tissue that binds the mucosa to the muscularis.

Q.2 A) Answer any TWO of the following 8M

- i. Draw a normal ECG. Explain the significance of segments and peaks.
- ii. Write note on conduction system of heart.
- iii. Explain in detail structure of blood vessels.

B) Answer any ONE of the following 4M

- i. Write a short note on cardiac arrhythmia.
- ii. Write the Pathophysiology of hypertension.

Q.3 A) Answer any TWO of the following 8M

- i. Discuss in detail functions of liver and add a note on hepatocyte.
- ii. Draw a neat labeled diagram of anatomy of Large intestine.
- iii. Give detail account on chemical digestion in small intestine.

B) Answer any ONE of the following 4M

- i. Explain pathophysiology of reflux oesophagitis.
- ii. Write a short note on jaundice.

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

- i. Discuss the process of reabsorption and secretion in proximate convoluted tubule.
- ii. Draw a neat labeled diagram of section of kidney and discuss functions of kidneys.
- iii. Give hormonal regulation of tubular reabsorption and secretion.

B) Answer any ONE of the following 4M

- i. Write a note on urinary tract infection.
- ii. Write the Pathophysiology of kidney stone.

Q.5 A) Answer any TWO of the following 8M  
i. Explain neural and hormonal regulation of blood pressure.  
ii. Explain mechanism of capillary exchange and comment on net filtration pressure.  
iii. Discuss in detail cardiac cycle.

B) Answer any ONE of the following 4M  
1. Write the Pathophysiology of Sexually transmitted diseases.  
2. Write a short note on infertility.

Q.6 A) Answer any TWO of the following 8M  
i. Enlist and discuss reproductive system ducts in male.  
ii. Write a note on oogenesis and follicular development.  
iii. Draw a neat labeled diagram of testis.

Q.6 B) Answer any ONE of the following 4M  
i. Write a note on electrolyte in body fluid.  
ii. Write a note on fluid compartments and fluid balance.



Q.P. Code : 27797

[Time: 3 Hours]

[ Marks: 80]

Please check whether you have got the right question paper.

N.B: 1. All questions are compulsory.

1.
  - a) Classify different types of intermolecular forces of attraction. 02
  - b) State Joule Thompson effect. 02
  - c) Give the expression for molar refraction. 02
  - d) Draw phase diagram of a two component system with lower consolute temperature. 02
  - e) State Henry's Law of solubility of gasses in liquids. 02
  - f) Acetic acid is a weak electrolyte. Comment. 02
  - g) Calculate the pH value of a solution whose hydrogen ion concentration is 0.006 mol/L. 02
  - h) Name any two methods for determination of surface tension. 02
  - i) What are wetting agents? Give examples. 02
  - j) Explain the terms relative viscosity and viscoelasticity. 02
2.
  - a) What is critical phenomena? Explain critical phenomena with respect to carbondioxide isotherms. 04
  - b) What is isotonicity? Explain any one class II method for adjusting isotonicity. 04
  - c) Explain upper and lower consolute temperatures with respect to nicotine-water system. 04
3.
  - a) Define refractive index. Explain the working of Abbe's refractometer. 04
  - b) Define pH. Explain buffers in biological systems. 04
  - c) Write a note on HLB. Calculate HLB of a surfactant having saponification value of 90 and acid value of 145. 04
4.
  - a) Explain in detail azeotropic mixtures. Calculate the vapour pressure lowering caused by the addition of 50 g of sucrose (Mol.wt = 342) to 1000g of water. The vapour pressure of pure water at 25°C is 23.8mm of Hg. 04

**OR**

State deviations from Raoult's Law & calculate the vapour pressure lowering on addition of 53.94g of a substance of molecular mass 182 to 1000g of water at 20°C. At this temperature, vapour pressure of pure water is 17.5mm Hg.

  - b) State distribution Law. Explain any 2 applications in Pharmacy. 04
  - c) Derive buffer equation for basic buffers. 04
5.
  - a) What is polymorphism? Give the pharmaceutical significance of polymorphs. 04
  - b) Define adsorption isotherm. Explain different types of adsorption isotherms. 04
  - c) What are non-newtonian systems? Explain pseudoplastic flow in detail. 04

**OR**

Classify non-newtonian systems and differentiate between pseudoplastic and dilatant systems.
6.
  - a) Write a note on supercritical fluid state. 04
  - b) Describe capillary rise method **OR** drop number method to determine surface tension. 04
  - c) Explain any one method for measurement of flow of non-newtonian systems. 04