Day: Friday
Date: 22-04-2016

Time: 2:00 P.M. TO 5:00 P.M.
Max. Marks: 80

N.B.:

1) **Q. No. 1** and **Q. No. 5** are **COMPULSORY**. Out of the remaining attempt any **TWO** questions from each section.
2) Figures to the right indicate **FULL** marks.
3) Answers to both the sections should be written in **SEPARATE** answer book.
4) Draw neat labeled diagrams **WHEREVER** necessary.

SECTION-I

Q.1 Answer any **FIVE** of the following: (10)

    a) Explain with example plane of symmetry.
    b) Draw Sawhorse projection:
        i) 2,3-Dichlorobutane   ii) 2- Bromo-1-chloropropane
    c) Differentiate between enantiomer and diasteriomers.
    d) What is geometric isomerism?
    e) Why meso compounds do not possess optical activity.
    f) Draw schematic diagram of polarimeter.
    g) Enlist the conditions for optical activity.

Q.2 Explain in detail resolution of racemic modification with suitable examples. (15)

Q.3 **a)** What is racemization? Explain different process with example. (08)

    b) Write in detail conformations of cyclohexane and comment on their stability. (07)

Q.4 Write short notes on any **THREE** of the following: (15)

    a) Walden inversion
    b) Rules to assign R and S configuration
    c) Principles of polarimeter
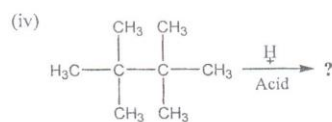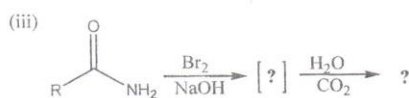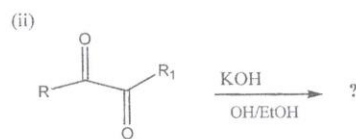   **d)** Sterioselective and steriospecific reactions

SECTION-II

Q.5 Answer any **FIVE** of the following: (10)

    a) Define with example:
        i) Synthon   ii) Synthetic equivalent
    b) Write any two synthetic applications of Wittig rearrangement.
    c) How Beckmann rearrangement helps to distinguish between *syn* and *anti*, isomerism.
    d) Write mechanism involved in Sommlet rearrangement.
    e) What do you mean by Claisen rearrangement? Write an example.
    f) Write steriochemistry of Hoffmann rearrangement.

P. T. O.

Q.6) Explain retro synthesis of Diclophenac, Paracetamol and Isoniazid. **(15)**

Q.7 **a)** Predict the products of the following: **(10)**

(i)

$\xrightarrow[\text{Aq. HCl}]{\text{AlCl}_3}$? + ?

(ii)

$\xrightarrow[\text{OH/EtOH}]{\text{KOH}}$?

(iii)

$\xrightarrow[\text{NaOH}]{\text{Br}_2}$ [?] $\xrightarrow[\text{CO}_2]{\text{H}_2\text{O}}$?

(iv)

$\xrightarrow[\text{Acid}]{\overset{+}{\text{H}}}$?
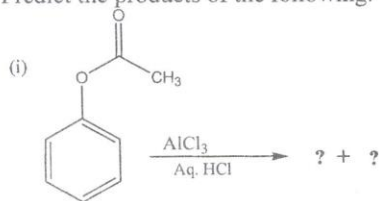
b) Explain rules for disconnection in retro-synthesis with suitable examples. **(05)**

Q.8 Write short notes on any **THREE** of the following: **(15)**

a) Bayer-villiger oxidation

b) Dakin oxidation

c) Wittig rearrangement

d) Retro-synthesis of Iburpofen

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Day: Thursday   Time 2:00 P.M.TO 5:00 P.M.
Date: 28-04-2016   Max Marks: 80

N.B:

1) Question **No 1** and **5** are **COMPULSORY**.
2) Out of remaining questions attempt **ANY TWO** questions from each section.
3) Figures to the right indicate **FULL** marks.
4) Answers to both the sections should be written in **SEPERTAE** answer book.

SECTION-I

Q.1   Answer **ANY FIVE** of the following: **(10)**
   a) What is oxidative phosphorylation?
   b) What is ketosis?
   c) State catabolism of aspartate.
   d) What is osteomalecia?
   e) What is physiological calcium?
   f) Why folic acid is called vitamin of regeneration?

Q.2   a) What is diagnostic polymerase chain reaction (PCR)? Explain in detail.   **(10)**
   b) What is renal clearance? Give its importance in the diagnosis of kidney diseases.   **(05)**

Q.3   a) What is pentose phosphate pathway? Explain in detail.   **(10)**
   b) State the biochemical role of transketolase and transaldolase.   **(05)**

Q.4   Write short notes on **ANY THREE** of the following: **(15)**

   a) Jaundice
   b) Glycolysis
   c) Kidney function tests KFT
   d) ATP synthatase and ETC

SECTION-II

Q.5   Answer **ANY FIVE** of the following: **(10)**
   a) What is oxidative deamination?
   b) What is renal acidosis?
   c) State catabolism of glutamate?
   d) What is beri- beri?
   e) What is osteophoresis?
   f) Why methionine is called amino acid of regeneration?

Q.6   a) What is transcription and reverse transcription? Explain post transcriptional modifications.   **(10)**
   b) What is gluconeogenesis? State its physiological importance.   **(05)**

Q.7   a) What is β– oxidation? Explain in detail.   **(10)**
   b) State propionate pathway and its importance.   **(05)**

Q.8   Write short notes on **ANY THREE** of the following: **(15)**
   a) Blood pH regulation
   b) Biosynthesis of fatty acids
   c) Kwashiorkor

Day: Tuesday   Time: 2:00 P.M. TO 5:00 P.M.
Date: 03-05-2016   Max Marks: 80

N.B:
1) **Q. No 1** and **5** are **COMPULSORY**. Out of remaining attempt **ANY TWO** Questions from each section.
2) Answers to both the sections should be written in **SEPARATE** answer book.
3) Figures to the right indicate **FULL** marks.

SECTION-I

Q.1   Answer **ANY FIVE** of the following: (10)

a) Derive an equation for ideal gas law.
b) What is UCT and LCT? Give examples of each.
c) What are additive and constitutive properties?
d) At boiling point, water has only one degree of freedom. True or False. Explain.
e) Explain in brief the term 'Phase'.
f) Differentiate between ideal and real solution.

Q.2 a) Define colligative properties. Prove that vapor pressure lowering and freezing point depression are colligative properties.   (08)

b) Explain in detail different intermolecular forces.   (07)

Q.3 a) Derive an expression for Gibb's Phase rule. What is reduced phase rule?   (08)
b) Define Raoult's law. Explain deviations from Raoult's law.   (07)

Q.4   Write short notes on **ANY THREE** of the following:
a) Ternary phase diagram   (15)
b) Kinetic molecular theory
c) Critical constants and their determination
d) One component three phase system

SECTION-II

Q.5   Answer **ANY FIVE** of the following: (10)

a) What is Q_{10} value?
b) What is effect of dilution on specific conductance?
c) Explain any two factors affecting solubility of weak electrolyte.
d) Differentiate between molecularity and order of reaction.
e) Give formula for Arrhenius equation. Define energy of activation.
f) Explain effect of temperature and pressure on solubility of gas.

Q.6 a) Define Nernst Distribution law. Explain the effect of molecular association and dissociation on Nernst distribution law.   (08)

b) Explain in detail solute-solvent interactions.   (07)

Q.7 a) Derive an expression for rate constant and half life of first order reaction. (08)
b) Explain Debye Huckel theory.   (07)

Q.8   Write short notes on **ANY THREE** of the following: (15)
a) Methods to determine order of reaction
b) Decomposition of medicinal agents
c) Conductometric titrations
d) Arrhenius theory

Day : Thursday   Time : 2:00 P.M. TO 5:00 P.M.
Date : 05-05-2016   Max. Marks : 80

N.B.:

1) **Q.No.1** and **Q.No.5** are **COMPULSORY**. Out of remaining questions attempt **ANY TWO** questions from each section.
2) Answers to both the sections should be written in **SEPARATE** answer books.
3) Draw sketches **WHEREVER** necessary.
4) Figures to the right indicate **FULL** marks.

SECTION - I

Q.1   Answer **ANY FIVE** of the following: [10]
  a) Write role of Oculars and Condensers.
  b) How Pasteur contributed to Microbiology?
  c) Highlight the role of a Bacterial cell wall.
  d) Actinomycetes are bacteria with fungal morphology.
  e) What is 'Candidiosis'?
  f) How anaerobic bacteria are inoculated?

Q.2   Give an exhaustive account on isolation and preservation of microbial cultures.   [15]

Q.3 a) Discuss principle, working and uses of Phase Contrast Microscopes.   [08]

  b) Fungi are a versatile group of microorganisms. Justify in detail.   [07]

Q.4   Write short notes on **ANY THREE** of the following: [15]
  a) Rickettsia
  b) Bacterial growth
  c) Whittaker's Five – Kingdom system
  d) Significance of Electron Microscopes

SECTION - II

Q.5   Answer **ANY FIVE** of the following: [10]
  a) Give features of an ideal disinfectant.
  b) How to sterilize talc and vaccines?
  c) What are bacteriophages?
  d) Mention importance of DOP test.
  e) Write about sterilization kinetics.
  f) Define 'Interferon' and 'Antiseptic'.

Q.6   Discuss the features and morphology of viruses. Explain life cycle of   [15]
  bacteriophages.

Q.7 a) How to evaluate disinfectants?   [08]

  b) Give an exhaustive account on Non-Thermal Sterilization Methods.   [07]

Q.8   Write short notes on **ANY THREE** of the following: [15]
  a) Biohazards
  b) Aseptic Area
  c) Cultivation of Viruses