Chem Organic Qp - imp notes

Chemistry (SRM Institute of Science and Technology)

c) Buna-N
d) Nylon-6,6

7. _____ undergoes permanent deformation on heating.
   a) Polythene
   b) PVC
   c) Teflon
   d) Bakelite

8. The strength of the polymer increases with _____ in molecular weight.
   a) Increase
   b) Decrease
   c) No change
   d) Slightly decrease

9. X-ray diffractometers are not used to identify the physical properties of which of the following?
   a) Metals b) Liquids c) Polymeric materials d) Solids

10. The source for XPS is -----
    a) Mercury - arc
    b) Nernst glower
    c) Globar source
    d) AlKα

Part – B (2 x 10 = 20 Marks)

11. a. Discuss the condensation polymerization process in the synthesis of Nylon and Polyurethane along with their properties and applications. (10 Marks)

(OR)

b. i. How polymers are classified based on origin and nomenclature? (6 Marks)
ii. Define degree of polymerization and functionality? (4 Marks)

12. a. i Discuss the synthesis, properties, and applications of polypropylene (4 Marks)
ii. Explain n and p doping in conducting polymers. (6 Marks)

(OR)

b. i. Explain Bragg's law with a neat diagram (6 Marks)
ii. Compute the Miller Indices for a plane intersecting at x= ¼, y=1, and z=1/2 (4 Marks)

Part- B (4X10 = 40Marks)

Answer ANY FOUR questions

11. (a) What are Enantiomers and Diastereomers? Give examples. (4 marks)

    (b) Explain the mechanism of hydrogen evolution type of corrosion. (6 marks)

12. (a) Derive Nernst equation and give any one application. (7 marks)

    (b) What is Internal energy? Give its relation with enthalpy. (3 marks)

13. (a) Define alternating axis of symmetry with an example. (4 marks)

    (b) Explain SN1 mechanism taking an example. (6 marks)

14. (a) Give the role of the following reagents in reduction and oxidation reactions.

    i.$NaBH_4$ ii. $KMnO_4$ (6Marks)

    (b) Give the synthesis and uses of Paracetamol. (4 marks)

15. Explain in detail the conformational analysis of n-butane with potential energy diagram. (10 Marks)

8. Which of the following is an application of glass-fibre reinforced composites?

a) Adhesives b) Conveyor belts c) Design of ships d) Automotive parts

9. XPS focuses on which of the following information?

a) Mass of the electron b) Charge of the electron c) Binding energy of the electron

d) Mass of the atoms

10. Minimum interplanar spacing required for Bragg's diffraction is _____

a) $\lambda/4$ b) $\lambda/2$ c) 4λ d) 2λ

Part-B (2 x 10= 20 Marks)

11. a) i.Explain the mechanism followed in the formation of anti-Markovnikov's product n-propyl bromide. (6 marks)

ii. Differentiate the reactivity of $LiAlH_4$ and $NaBH_4$ with one reaction as an example. (4marks)

(OR)

b) From the following given monomers, explain the synthesis of their polymers. (10marks)

i. Styrene and Butadiene ii. Ethylene glycol and terephthalic acid

iii. ε amino caproic acid iv. Tetra fluoro ethylene

12. a) i. Write notes on Fibre reinforced composites with examples.

ii. Define Functionality and give its significance.

(OR)

b) Discuss in detail about the instrumentation and working of XPS with a neat diagram. (10marks)

SET 1

DEPARTMENT OF CHEMISTRY

College of Engineering and Technology
SRM Institute of Science and Technology
Kattankulathur – 603203

CLA 3

Program: B.Tech
Course Code & Title: 21CYB101J / Chemistry
Year & Sem: I/II

Date: 04-05-2023
Time: 8.00-9.00am
Max. Marks: 30

Answer ALL the MCQs Part-A (10 x 1=10 Marks)

1. Which of the following is an initiator molecule in the free radical polymerisation?

a) Sulphuric acid b) Benzoyl peroxide c) Potassium permanganate d) Chromium oxide

2. The IUPAC name for paracetamol is

a) 2-Acetoxybenzoic acid b) Monohydroxybenzene c) N-(4- hydroxyphenyl) acetamide d) Phenyl Salicylate

3. Which of the following are thermoplastic?

i) Teflon ii) Bakelite iii) Vulcanised rubber iv) Polystyrene

a) ii only b) i and iv c) ii and iii d) i only

4. The chemical name of Nylon 6,6 is

a) Poly vinyl chloride b) Poly caprolactum c) cis-poly isoprene

d) Polyhexamethyleneadipamate

5. Natural rubber is basically a polymer of

a) Neoprene b) Isoprene c) Chloroprene d) Butadiene

6. In addition polymer, monomer used is

a) Saturated compounds b) Unsaturated compounds c) Bifunctional saturated compounds

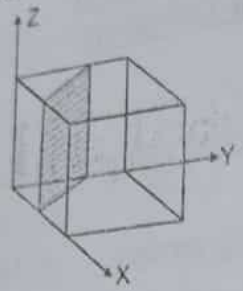
d) Trifunctional saturated compounds

7. Usually the stronger constituent of a composite is

a) Matrix b) Coating c) Laminar d) Reinforcement

9. Which of the following is the most commonly used detector in X-ray Photoelectron Spectroscopy?
a) Electron multiplier
b) Dynodes
c) Photovoltaic cell
d) Photomultiplier

10. Miller Indices for the plane shown in the below figure is



a) (1 2 0)
b) (2 1 0)
c) (2 2 0)
d) (0 0 2)

Part – B (2 x 10 = 20 Marks)

11. a. Write a short note on the following: (4+4+2 Marks)
i. Dieckmann condensation
ii. Oxidation of organic compounds by $KMnO_4$
iii. Ring opening reactions of cyclopropane with H_2 and HBr

(OR)

b. Discuss the n and p – doping mechanism in conducting polymers. (10 Marks)

12. a. i. How crosslinked polymers and linear polymers differ? Give an example for each. (4 Marks)

ii. Explain the principle of X-ray Photoelectron Spectroscopy and mention any two applications of it. (6 Marks)

(OR)

b. Brief about the particle reinforced and metal matrix composites with examples. (10 Marks)

8. The continuous phase of a composite material is known as its_____
a) dispersed phase b) surrounding phase
c) matrix phase d) fiber phase

9. In the hemispherical electron analyser of XPS, _____ is detected and plotted as a function of energy.
a) Mass b) Charge
c) Number of electrons striking the detector d) Mass to charge ratio

10. If (3 2 6) are the Miller Indices of a plane, the intercepts made by the plane on the three crystallographic axes are
a) (a, b, c) b) (2a, 3b, c) c) (a, 2b, 3c) d) (2a, b, 3c)

Part – B (2 x 10 = 20 Marks)

11. a. i. Explain the mechanism of Nucleophilic Substitution reaction, S_N1 with an example. (6 Marks)
ii. Write the preparation and uses of the medicinal drug, Paracetamol. (4 Marks)

(OR)

b. i. Discuss the different types of tacticity shown by the polymers with example. (6 Marks)
ii. Write down the preparation, properties and uses of any one of the Polyamide fibres. (4 Marks)

12. a. i. Give the preparation, properties and uses of any one of the conducting polymers. (6 Marks)
ii. Arrive the equation $n\lambda = 2d\sin\theta$ used to predict the structure of crystals. (4 Marks)

(OR)

b. Elaborate the stress – strain relationship of solids with a neat plot. (10 Marks)

SRM

DEPARTMENT OF CHEMISTRY
College of Engineering and Technology
SRM Institute of Science and Technology
Kattankulathur – 603203

Set-1

CLA – III

Program: B.Tech
Course Code & Title: 21CYB101J & Chemistry
Year & Sem: I Year & II Sem

Date: 08.05.2023
Duration: 12.30 – 1.30 PM
Max. Marks: 30 Marks

Part – A (10 x 1 = 10 Marks)
Answer ALL the Questions

1. Markovnikov's law is applied in
   a) Addition of propylene with Cl_2
   b) Addition of propylene with HBr
   c) Addition of ethylene with Br_2
   d) Addition of ethylene with H_2

2. Which one of the following on reductio with Lithium Aluminium Hydride ($LiAlH_4$) yields a secondary amine?
   a) Methyl isocyanide
   b) Nitroethane
   c) Acetamide
   d) Methyl cyanide

3. Polydispersity index is defined as _____, where M_w and M_n are the weight average and number average molecular masses respectively.
   a) $M_w \times M_n$
   b) M_n/M_w
   c) $M_w - M_n$
   d) M_w/M_n

4. What is Teflon?
   a) $(CF_2)_n$
   b) $(C_2F)_n$
   c) $(C_2F_4)_n$
   d) $(C_4F_2)_n$

5. The characteristics of condensation polymerization are given below:
   I. only –C–C– linkages present in the polymer structure
   II. use of bifunctional or polyfunctional monomers
   III. elimination of a small by-product molecule

   Which of the following is true?
   a) I, II, III
   b) II and III
   c) I and III
   d) Only III

6. The non – metal used in the vulcanization of rubber is _____
   a) Phosphorous
   b) Graphite
   c) Silicon
   d) Sulphur

7. Which of the following statements is correct for ductile materials.
   a) Large deformation takes place between elastic limit and fracture point
   b) Have no proportional limit
   c) Break immediately after proportional limit
   d) Cannot be drawn into wires

7. Longitudinal strength of fibre reinforced composite is mainly influenced by

a) Fibre strength b) Interface strength c) Elastic modulus d) Wear resistance

8. Which of the following does not combine with fibre to give composites?

a) Metals b) Ceramics c) Non-metals d) Polymers

9. The energy required to remove an electron from the highest occupied atomic orbital is

a) Kinetic energy b) Ionization energy c) Binding energy d) Vibrational energy

10. Calculate the Miller Indices of the plane, whose intercepts along the axes are (a,2b,3c)

a) (1 2 3) b) (3 2 1) c) (2 3 6) d) (6 3 2)

Part-B (2x 10= 20 Marks)

11. a)i) Discuss in detail about S_N1 mechanism in detail with an example. (6marks)

ii) Complete the following reactions (4marks)

1) $CH_2 = CH_2 \xrightarrow{\text{cold.dil.KMnO}_4/H_2O} ?$

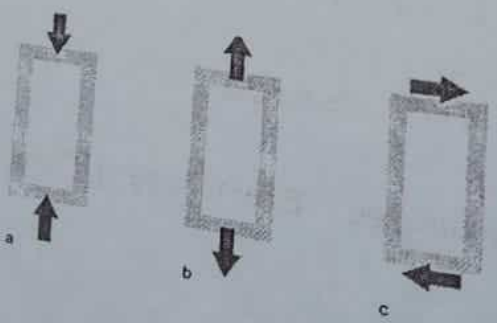
2) $CH_3\text{-}CH_2\text{-}C{\equiv}N \xrightarrow{LiAlH_4/H_2O} ?$

(OR)

b) Write the preparation, properties and uses of synthetic rubber and polystyrene.

12. a) i. Brief on extrinsically conducting polymers. (10 marks)

ii. From the figures given below, identify and define the different types of stress. (4 marks)
(6Marks)



(OR)

b) i. Discuss on principle and applications of XPS.

ii) What is inter-planar spacing's in lattices? Give the expression taking an example. (6Marks)
(4marks)

DEPARTMENT OF CHEMISTRY

College of Engineering and Technology
SRM Institute of Science and Technology
Kattankulathur – 603203

CLA 3

Program: B.Tech
Course Code & Title: 21CYB101J / Chemistry
Year & Sem: I/II

Date: 04-05-2023
Time: 12.30-1.30pm
Max. Marks: 30

Part-A (10x1=10 Marks)

Answer ALL the MCQs

1. The reactivity order of alkyl halides in S_N2 mechanism is

a) $CH_3X > 1^0 > 2^0 > 3^0$ b) $CH_3X > 2^0 > 1^0 > 3^0$ c) $CH_3X > 3^0 > 1^0 > 2^0$ d) $CH_3X > 3^0 > 2^0 > 1^0$

2. The product of Dieckmann condensation reaction is

a) Cyclic alcohol b) β keto esters c) Cyclic ketone d) Alkane

3. Which of the following are the characteristics of thermosetting polymers?

i) Heavily branched cross linked polymers ii) Linear slightly branched long chain molecules

iii) Become infusible on moulding, so cannot be reused iv) Soften on heating and harden on cooling, can be reused

a) ii and iv b) i only c) iii only d) i and iii

4. The type of linkage present in poly urethane is

a) Amide linkage b) Glycosidic linkage c) Ester linkage d) Phospho diester linkage

5. Terylene is a

a) Poly ester b) Poly ethylene c) Poly propylene d) Poly amide

6. Cis polyisoprene units present in natural rubber is an example of---- polymer.

a) Isotactic b) Syndiotactic c) Atactic d) both a and b

SET 2

DEPARTMENT OF CHEMISTRY

College of Engineering and Technology
SRM Institute of Science and Technology
Kattankulathur – 603203

CLA 3

Program: B.Tech
Course Code & Title: 21CYB101J / Chemistry
Year & Sem: I/II

Date: 04-05-2023
Time: 12.30-1.30pm
Max. Marks: 30

Part-A (10 x 1=10 Marks)

Answer ALL the MCQs

1. In S_N1 the first step involves the formation of_____

a) Free radical b) Carbanion c) Final product d) Carbocation

2. Markovnikov's law is applied in addition of ----

a) Propylene with Cl_2 b) Propylene with HBr c) Ethylene with Br_2 d) Ethylene with HCl

3. Heating of rubber with sulphur is known as:

a) Galvanization b) Bessemerisation c) Vulcanization d) Sulphonation

4. The S-in Buna-S refers to

a) Sulphur b) Styrene c) Sodium d) Salicylate

5. Which of the following is used for making rechargeable batteries?

a) Polypyrrole b) Polyester c) Polyaniline d) Polyacrylonitrile

6. The non-stick layer of kitchenware contains:

a) Teflon b) Acrilan c) Dacron d) Nylon

7. The property of a body by virtue of which it tends to regain its original size and shape when the applied force is removed is called

a) Elasticity b) Plasticity c) Rigidity d) Compressibility

8. The continuous phase of a composite material is known as its ----------

a) Dispersed phase b) Surrounding phase c) Matrix phase d) Fiber phase

9. In XPS process, the photon ejects which of the following?

a) 1s electron b) 1p electron c) 2s electron d) 2p electron

10. If the angle of incidence is 30°, then the wavelength for first-order spectrum is equal to

a) 2d b) d/2 c) d/3 d) d

Part – B (2 x 10 = 20 Marks)

11. a) i. What is the reaction of the following with Cyclopropane? (4 Marks)
A. Halogens B. HI C. sulphuric acid D. Hydrogen

ii. Explain Dieckmann condensation with an example. (6 Marks)

(OR)

b) i. Identify the type of polymer for the following and write a note on it. (4Marks)

A. —A—A—A—A—A—A— B. —A—B—B—A—A—A—B—A—

ii. Discuss briefly on n and p doping in conducting polymers. (6Marks)

12. a) i. Write notes on metal matrix composites.

ii. Give the differences between Thermoplastic and Thermosets.

(OR)

b) Explain Bragg's law. How its principle is applied on studying diffraction of X- rays by atoms in a crystalline structure with a neat sketch.

SRM Institute of Science and Technology
Kattankulathur – 603203

CLA – III

Program: B.Tech
Course Code & Title: 21CYB101J & Chemistry
Year & Sem: I Year & II Sem

Date: 08.05.2023
Duration: 12.30 – 1.30 PM
Max. Marks: 30 Marks

Part – A (10 x 1 = 10 Marks)
Answer ALL the Questions

1. The rate of nucleophilic substitution reactions is higher in the presence of _____
   a) Electron withdrawing groups
   b) Electron releasing groups
   c) Both electron withdrawing and releasing groups
   d) Initiator

2. Oxidation of Ethene with cold alkaline $KMnO_4$ produces
   a) Formaldehyde
   b) CO_2 and H_2O
   c) Ethylene glycol
   d) Oxalic acid

3. Calculate the number average molecular mass of a polymer having four different monomers A, B, C and D present in equal number. The molecular masses of the monomers are 10000, 15000, 30000 and 50000 respectively.
   a) 10050
   b) 17350
   c) 26250
   d) 35475

4. A polymer with amide linkage is known as
   a) Terylene
   b) Teflon
   c) Bakelite
   d) Nylon-6,6

5. For which plastics can the process of heat softening, moulding and cooling to rigidness be repeated?
   a) thermosetting plastics
   b) thermoplastics
   c) bakelite
   d) Urea-formaldehyde

6. The monomer unit of natural rubber (polymer) is
   a) Isoprene
   b) Neoprene
   c) Chloroprene
   d) Butadiene

7. Which of the following statements is correct for brittle materials.
   a) It breaks soon after elastic limit is crossed
   b) It shows significant plastic deformation before breaking
   c) It is used to make wires
   d) Stress is never proportional to strain

8. Which of the following does not combine with fiber to give composites?
   a) Metals
   b) Ceramics
   c) Non-metals
   d) Polymers

DEPARTMENT OF CHEMISTRY

College of Engineering and Technology
SRM Institute of Science and Technology
Kattankulathur – 603203

CLA 3

Program: B.Tech
Course Code & Title: 21CYB101J / Chemistry
Year &Sem: I / II

Date: 04-05-2023
Time: 8.00-9.00 am
Max. Marks: 30 Marks

Answer ALL the MCQs Part-A (10 x 1=10 Marks)

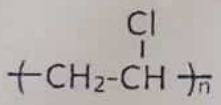
1. S_N2 reactions are

a) Usually occur through unimolecular b) Unimolecular c) Bimolecular d) both b and c

2. Aspirin is ------.

a) Acetylsalicylic acid b) Benzoyl salicylic acid c) Chlorobenzoic acid d) Anthranilic acid

3. The polymer shown is a _____.



a) Elastomer b) Fibre c) Thermoplastic d) Thermosetting plastic

4. Nylon-6 is made from

a) 1, 3-Butadiene b) chloroprene c) adipic acid d) caprolactam

5. The random orientation of the polymeric chain in a polymer is called

a) Isotactic b) Atactic c) Syndiotactic d) Elastomer

6. Weight average molecular weight _____ on the weight of molecules in a polymer.

a) Dependent b) Independent c) Partially dependent d) Neither dependent nor independent

7. ESCA can identify elements in the periodic table above which of the following element?

a) Carbon b) Boron c) Helium d) Potassium

8. Hooke's law essentially defines

a) Stress b) Strain c) Yield point d) Elastic limit

9. Kevlar is a------ type of material.
a) Glass b) Thermoplastic c) Whisker d) Polymer

10. Which of the following technique is used to investigate the molecular structure through the growth of solid crystals?
a) Radiotherapy b) Fluoroscopy c) Computed Tomography d) X-ray crystallography

Part-B (2 x 10= 20 Marks)

11. a) i.Explain E2 mechanism by taking an example.
ii. Give the synthesis and uses of Paracetamol

(OR)

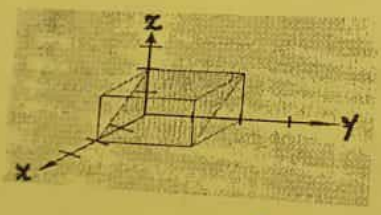
b) i. How polymers are classified based on origin and nomenclature? (6Marks)
ii. Suggest the products when 1, 3 – butadiene reacts with the following and provides suitable equations: (4Marks)
A) Acrylonitrile B) Styrene

12. a) i.At what glancing angle (θ), would first order reflection from (110) plane of KCl crystal be observed using X-ray of wavelength (λ) = 145pm and dimension of unit cell is 315pm? (4Marks)

ii. How isotactic and atactic polymers differ? Give an example for each. (6Marks)

(OR)

b) i) Compute the Miller indices for the shaded planes given below: (6marks)

A) 

303

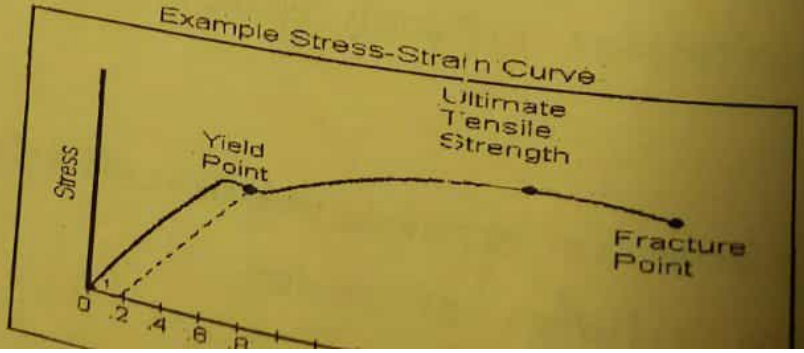
B) 

632

C) 

010

ii. Explain the points given in stress-strain curve below: (4Marks)



College of Engineering and Technology
SRM Institute of Science and Technology
Kattankulathur – 603203

Internal Assessment – III

Program: B.Tech
Course Code & Title: 18CYB101J/Chemistry
Year & Sem: I/II

Date: 20-06-2022
Time: 10.00-11.40am
Max. Marks: 50 Marks

Part-A (10X1=10 Marks)

Answer ALL the questions

1. Which of the following is not an example of chiral object?
   a) Cylindrical helix b) Square box c) Sandal or shoe d) Glove
2. Select the incorrect statement from the following option.
   a) The physical properties of enantiomers are identical
   b) In symmetrical environment, the chemical properties of enantiomers are identical
   c) The enantiomers react at same rate and form products in same amounts in asymmetrical environment d) Enantiomers have different solubilities in same chiral solvent
3. The plane which divides the molecule into two equal parts so that each half is the mirror image of other half is called
   a) Centre of symmetry b) Plane of symmetry c) Axis of symmetry d) Angle of symmetry
4. Decrease in free energy can be given by $-\Delta G =$ _____
   a) nFE b) n/FE c) nF/E d) F/nE
5. In Pourbaix diagram of iron one of the reactions depicted below is both potential and pH dependent
   a) $2Fe^{2+}+3H_2O \longrightarrow Fe_2O_3(s)+6H^++2e^-$ b) $Fe^{2+}+2e^- \longrightarrow Fe(s)$ c) $2Fe^{3+}+3H_2O \longrightarrow Fe_2O_3(s)+6H^+$
   d) $Fe^{3+}+e^- \longrightarrow Fe^{2+}$
6. The number of configurational isomers of molecules having (n) different chiral carbons is
   a) 2n b) 2^n c) 2^{n-1} d) 2^{n+1}
7. Find the number of stereoisomers for $CH_3 – CHOH – CH = CH – CH_3$
   a) 1 b) 2 c) 3 d) 4
8. The potential energy of n-butane is maximum for
   a) Skew conformations b) Staggered conformations c) Eclipsed conformations
   d) Gauche
9. Which of the following reactions are favoured by polar aprotic solvent?
   a) S_N1 reactions b) S_N2 reactions c) Both S_N1 and S_N2 reactions d) Free radical reactions
10. $[Co(NH_3)_6][Cr(C_2O_4)_3]$ and $[Cr(NH_3)_6][Co(C_2O_4)_3]$ is an example for
    a) Coordination isomerism (b) Ionisation isomerism (c) hydrate isomerism
    (d) linkage isomerism

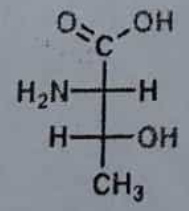
Program: B.Tech.
Course Code & Title: 18CYB101J/Chemistry
Year & Sem: I/II

Date: 20-06-2022
Time: 10.00-11.40am
Max. Marks: 50 Marks

Part-A (10X1=10 Marks)

Answer ALL the questions

1. Chiral molecules which are non-super-imposable mirror images of each other are called
   a) Diastereomers b) Meso compounds c) metamers d) Enantiomers
2. When a molecule has a plane of symmetry, it will be _____
   a) Optically inactive b) Optically active c) Both optically active and optically inactive d) Enantiomer
3. Generally, electrode potential refers to _____
   a) Reduction potential b) Oxidation potential c) Electron potential d) Cannot be determined
4. In an open system, for maximum work the process must be entirely
   a) irreversible b) reversible c) adiabatic d) both a and c
5. The following are state functions EXCEPT
   a) H b) q c) E d) S
6. The number of racemic forms of molecules having (n) different chiral carbons is
   a) 2n b) 2^n c) 2^{n-1} d) 2^{n+1}
7. In gauche conformations, the methyl groups in n-butane are
   a) 60^0 apart b) 90^0 apart c) 180^0 apart d) 360^0 apart
8. The rate of nucleophilic substitution reactions is higher in the presence of
   a) Electron withdrawing groups b) Electron releasing groups
   c) both electron withdrawing and releasing groups d) radicals
9. Drugs that are used to diagnose, cure and prevent disease are called
   a) Pharmaceutical drugs b) addictive drugs c) industrial drugs
   d) single cell drugs
10. Assign the notation for the top and bottom chiral centres of the following molecule that is shown in the form of Fischer projection:

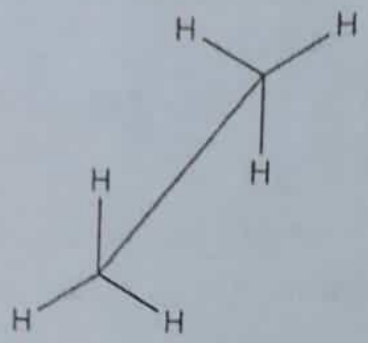


a) 1R, 3S b) 2S, 3S c) 2R, 3R d) 2S, 3R

Part- B (4X10 = 40Marks)

Answer ANY FOUR questions

11. (a) What are hard and soft bases? Give examples.
(b) Find the projection which is shown below and write a note on it.



12. Derive Gibbs-Helmoltz equation and give any one application. (10 Marks)

13. (a) Define standard electrode potential. Write the Nernst equation for the following cell reaction $Zn(s)/Zn^{2+}$ (aq) // Cu^{2+} (aq) / Cu(s) (2 marks)

(b)Give the addition reaction products formed when Cyclopropane reacts with the following: (8 marks)

i) Halogens ii) HI iii) Sulphuric acid iv) Hydrogen

14. Discuss on types of isomerism exhibited in transition metal compounds with suitable examples.

15. (10 Marks)

16. (a) Explain free radical mechanism taking an example. (5 Marks)

(b) Explain Dieckmann condensation with an example. (5 Marks)

SRM INSTITUTE OF SCIENCE & TECHNOLOGY

DEPARTMENT OF CHEMISTRY
College of Engineering and Technology
SRM Institute of Science and Technology
Kattankulathur – 603203

SET – I

INTERNAL ASSESSMENT – III

Program: B.Tech
Course Code & Title:21CYB101J & Chemistry
Year & Sem: I Year & I Sem

Date: 10/12/2022
Duration: 8:00 – 09:00 AM
Max. Marks: 30

Part – A (10 x 1 = 10 Marks)
Answer ALL The Questions

1. Which of the following is a thermosetting polymer?
   a) polystyrene
   b) polyolefins
   c) nylons
   d) phenolic resins

2. The characteristics of condensation polymerization are given below
   I. only −C−C− linkages present in the polymer structure
   II. use of bifunctional or polyfunctional monomers
   III. elimination of a small byproduct molecule
   Which of the following is true?
   a) I, II, III
   b) II and III
   c) I and II
   d) Only III

3. Which of the following is true for the resultant polymer product formed, when molecules of phthalic acid react with molecules of glycerol?
   a) branch polymer
   b) cross-link polymer
   c) linear polymer
   d) none of the mentioned

4. Which of the following category does cellulose nitrate fall into?
   a) natural
   b) synthetic
   c) semi-synthetic
   d) none of the mentioned

5. Polymers are not classified on the basis of which of the following?
   a) Source
   b) Number of monomers
   c) Method of preparation
   d) Structure

6. Which of the following is not a natural polymer?
   a) Rayon
   b) Starch
   c) Cellulose
   d) RNA

7. The compound $[-CH_2-CH(C_6H_5)^-]_n$ is a _____
   a) homopolymer
   b) co-polymer
   c) condensation polymer
   d) network polymer

8. _____ is the property of recovering original shape after the removal of deforming strain.
   a) Rigidity modulus
   b) Youngs modulus
   c) Elasticity
   d) Bulk modulus

9. Minimum interplanar spacing required for Bragg's diffraction is _____
   a) $\lambda/4$ b) $\lambda/2$ c) 4λ d) 2λ

10. In XPS, the primary and secondary beams consist of
   a) X-ray photon, electron
   b) electrons, X-ray photon
   c) electrons, electrons
   d) UV-photons, electrons

Part – B (2 x 10 = 20 Marks)

11. a. Discuss the addition polymerization process in the synthesis of PVC and polystyrene along with the properties and applications. (10 Marks)

(OR)

b. i. Explain polymer tacticity and its types. (6 Marks)
   ii. Write a short note on the synthesis and properties of synthetic rubber. (4 Marks)

12. a. i. Differentiate thermoplastic and thermosets. (6 Marks)
   ii. Write a short note on synthesis and properties of a conducting polymer. (4 Marks)

(OR)

b. Discuss the principle, instrumentation, and applications of XPS. (10 Marks)

SRM INSTITUTE OF SCIENCE & TECHNOLOGY

DEPARTMENT OF CHEMISTRY
College of Engineering and Technology
SRM Institute of Science and Technology
Kattankulathur – 603203

SET – II

INTERNAL ASSESSMENT – III

Program: B.Tech
Course Code & Title: 21CYB101J & Chemistry
Year & Sem: I Year & I Sem

Date: 10/12/2022
Duration: 8:00 – 09:00 AM
Max. Marks: 30

Part – A (10 x 1 = 10 Marks)
Answer ALL The Questions

1. Which of the following polymer type is not classified on the basis of its application and properties?
   a) rubbers
   b) plastics
   c) fibres
   d) synthetic
2. Which of the following monomers are unsuitable for condensation polymerization?
   a) propanoic acid and ethanol
   b) butane-dioic acid and glycol
   c) diamines and dicarboxylic acids
   d) hydroxy acids
3. Which of the following kind of polymers are known for their high crystallinity?
   a) isotactic
   b) syndiotactic
   c) atactic
   d) gauche tactic
4. Which of the following is a co-polymer?
   a) Polythene
   b) Bakelite
   c) PVC
   d) Polyacrylonitrile
5. Which of the following types of polymers is not based on the classification by the source?
   a) Natural
   b) Semi-synthetic
   c) Elastomers
   d) Synthetic
6. The synthesis of which of the following polymers involves the repeated loss of small molecules?
   a) Polythene
   b) Buna-S