Dept. of Chemistry
Vivekananda College
Tiruvedakam West
Date: 02.03.2019

II Sessional Test
II Semester
Max. Marks: 50
Time : 2 Hours

ORGANIC CHEMISTRY - II (33CT21)

## SECTION - A

## Multiple choice questions:

Answer ALL questions

1) Trans-2- phenyl-1 bromocyclopentane on reaction with alcoholic KOH produce (CO1)
a) 4-phenylcyclopentene
b) 2-phenylcyclopentene
c) 1-phenylcyclopentene
d) 3-phenylcyclopentene
2) Which statement about hydroboration of propene is INCORRECT?
(CO3)
a) Hydroboration followed by treatment with $\mathrm{H}_{2} \mathrm{O}_{2}$ gives propan-1-ol
b) Addition of a $\mathrm{B}-\mathrm{H}$ bond to the alkene is Markovnikov addition
c) The alkene is an electron donor.
d) $\mathrm{BH}_{3}$ acts as an electrophile.
3) A benzaldehyde reacts with acetic anhydride in the presence of sodium acetate at $180^{\circ} \mathrm{C}$ to give (CO3)
a) Mandelic acid
b) Cinnamic acid
c) Benzoic acid
d) Malonic acid
4) Wolf-kishner reduction is applied to one the following functional group
a) carbonyl
b) alkene
c) alkyne
d) amide
5) Lithium diisopropyl amide is also called as
a) Harpoon base b) Non-Nucleophilic base c) Nucleophilic base d) Both a \& b

## SECTION - B

## Answer any FIVE questions

$(5 \times 2=10)$
6) Define Hofmann rule and Saytzeff rule.
7) What do you mean by Darzen reaction?
8) State Markovnikov rule.
9) What are ylides? Give one example.
10) Identify the product in the following reaction.

11) What is Skraup synthesis? Given an example.
12) Define CRAM's Rule with one example.

SECTION - C
Answer any THREE questions
13) Explain $E_{1}$ and $E_{2}$ reaction with suitable mechanism.
(CO1)
14) Discuss the mechanism of i) Aldol condensation ii) Benzoin condensation
(CO3)
15) How Grignard reagents are prepared? Illustrate any three synthetic utility.
(CO3)
16) Describe Baeyer-Villiger oxidation with mechanism.
(CO4)
17) List out the important applications Gilman's Reagent with examples.
(CO5)

## SECTION - D

## Answer any TWO questions

18) Write a note on i) Michael addition ii) Sharpless asymmetric epoxidation iii) Mannich reaction iv) Diels-Alder reaction (3+3+3+3) (CO3)
19) Explain in detail about Shapiro reaction and Meerweein Ponndorf - verley reduction.(CO4)
20) Find out the products.
(CO5)
1. 




THF, $-\mathbf{7 8}^{\mathbf{0}} \mathrm{C}$
2.
 $\xrightarrow[\text { 2. } \mathrm{CH}_{3}-\mathrm{I}]{\text { 1. LDA }}$ ?
3.

4.


5.



## Answer ALL questions

1. The oxidation state of molybdenum in $\left[\left(\eta^{7} \text {-tropylium }\right) \mathrm{Mo}(\mathrm{CO})_{3}\right]^{+}$is
(a) +2
(b) +1
(c) 0
(d) -1
2. The total number of $\mathrm{Cu}-\mathrm{O}$ bonds present in the crystalline copper (II) acetate monohydrate is:
(a) 10
(b) 6
(c) 8
(d) 4
3. The spectroscopic ground state symbol and the total number of electronic transition of $\left[\mathrm{Ti}\left(\mathrm{H}_{2} \mathrm{O}\right)_{6}\right]^{3+}$ are
(CO3)
(a) ${ }^{3} \mathrm{~T}_{1 \mathrm{~g}}$ and 2
(b) ${ }^{3} \mathrm{~A}_{2 \mathrm{~g}}$ and 3
(c) ${ }^{3} \mathrm{~T}_{1 \mathrm{~g}}$ and 3
(d) ${ }^{3} \mathrm{~A}_{2 \mathrm{~g}}$ and 2
4. Electron transfer from $\left[\mathrm{Fe}\left(\mathrm{H}_{2} \mathrm{O}\right)_{6}\right]^{2+}$ to $\left[\mathrm{Fe}\left(\mathrm{H}_{2} \mathrm{O}\right)_{6}\right]^{3+}$ is likely to occur via:
(CO4)
(a) d-d transition
(b) $\mathrm{S}_{\mathrm{N}} 1$
(c) inner sphere electron transfer
(d) outer sphere electron transfer
5. Which is the most common oxidation state for thorium in its compounds?
(CO5)
a) +3
b) +4
c) +5
d) +6

## SECTION - B

## Answer any FIVE questions

$$
(5 \times 2=10)
$$

6. Define EAN rule and give two examples.
7. What do you mean by spectrochemical series and write spectrochemical series?
8. Show the complexes which form $\mathrm{sp}^{3}$ hybridisation $\mathrm{dsp}^{2}$ hybridisation
9. Write the limitations of Orgel diagram.
10. What is diamagnetism and it is due to what?
11. Give the electronic configuration for the following elements $\mathrm{Th}, \mathrm{Pu}, \mathrm{Fm}$ and Lr .
12. List out the important uses of thorium.

## SECTION - C

## Answer any THREE questions

13. Discuss the Job's method to determine the stability constant.
14. Discuss the crystal field splitting of square planar complexes
15. What is the purpose of Orgel diagram? Draw the Orgel diagram for $d^{8}$ state for both octahedral and tetrahedral.
16. Interpret inner sphere electron transfer mechanism.
17. Compare and explain the relative tendencies of lanthanides and actinides to form complexes.

## SECTION - D

## Answer any TWO questions

18. Account on Jahn-Teller distortion and discuss the Jahn-Teller effect versus chelate effect.
19. (i) Analyze the reason for intense color of permanganate ion. (6 mark)
(ii) Compare d-d spectra and charge transfer spectra. (4 mark)
20. What are the problems in the separation of lanthanides from one another? Discuss the ion exchange and solvent extraction methods for the separation of lanthanides.

## SECTION - A

## Multiple choice questions:

1. UsingHuckel molecular orbital approximation, the two roots of secular equation of ethane are
(a) $\alpha+\sqrt{ } 2 \beta, \alpha-\sqrt{ } 2 \beta$
(b) $\alpha+\beta, \alpha$
(c) $\alpha+\beta, \alpha-\beta$
(d) $\alpha+2 \beta, \alpha-2 \beta$
(CO1)
2. What will be the value of slope after drawing graph of $\log \mathrm{x} / \mathrm{m} \rightarrow \log \mathrm{p}$ in Freundlich? adsorption isotherm?
(CO4)
(a) $1 / \mathrm{p}$
(b) $1 / \mathrm{n}$
(c) $1 / \mathrm{a}$
(d) -k
3.The selection rule of the translational energy levels in the Raman spectrum is
a) $\Delta \mathrm{J}= \pm 1$
b) $\pm 2$
c) $\pm 1$
d) $\pm 2$
4.For pure vibrational spectra, the selection rule is
a) 0
b) $\pm 1$
c) $0, \pm 1$
d) $\pm 1,2$
3. Which of the following decay with change in multiplicity is known as ISC?
(a) $\mathrm{S}_{1} \rightarrow \mathrm{~S}_{0}$
(b) $\mathrm{S}_{2} \rightarrow \mathrm{~S}_{1}$
(c) $\mathrm{T}_{2} \rightarrow \mathrm{~T}_{1}$
(d) $\mathrm{S}_{1} \rightarrow \mathrm{~T}_{1}$

## SECTION - B

## Answer ANY FIVE questions

6. Give the selection rule for Raman spectra
7. What is the difference between IR and Raman spectroscopy?

## SECTION - C

## Answer any THREE questions

13. Construct the wave function of the $\mathrm{sp}^{3}$ hybrid orbital in water molecule (CO4)
14. Deduce the Langmuir adsorption isotherm
(CO4)
15. Illustrate the principles of photoelectron spectroscopy.
(CO3)
16. Sketch the normal modes of vibration of a) $\mathrm{H}_{2} \mathrm{O}$ and b) $\mathrm{CO}_{2}$ and determine which are IR active / inactive and why?
(CO2)
17. Write a short note on Kasha test
(CO5)

## SECTION - D

## Answer any TWO questions

18. Set up the Huckel secular equation for 1,3 butadiene and benzene, calculate the energies of the $\pi$ electron and determine the delocalization energy.
19. Discuss the rotation-vibration spectrum of a diatomic molecule and show the appearance of the spectrum consisting of the P and R branches.
(CO3)
20. Derive Stern-Volmer equation.
(CO 5)

## II-M.Sc CHEMISTRY

Dept. of Chemistry
Vivekananda College
II Sessional Test

Tiruvedakam West
Date: 05.03. 2019

IV Semester<br>Max. Marks: 50<br>Time: 2 Hours

ORGANIC CHEMISTRY -IV (33CT41)

SECTION - A

## Answer ALL questions

1. Which type of reaction do we use for the production of Fluorobenzene?
a) Sandmeyer's reaction
b) Addition reaction
c) Substitution reaction
d) Rearrangement reaction
2. Which of the following is found on RNA but not DNA?
a) Phosphate
b) Deoxyribose
c) Uracil
d) Adenine
3. The first intermediate formed from a neutral substrate in anodic oxidation is
(a) anion radical
(b) cation radical
(c) free radical
(d) carbocation
4. Supramolecular chemistry deals with molecules of length scales
a) $1-100 \mathrm{~A}$
b) $1-100 \mathrm{~nm}$
c) $1-100 \mathrm{~cm}$
d) $1-100 \mathrm{pm}$
5. Which one of the following controls the urine cycle?
(a) cholesterol
(b) progesterone
(c) oesterone
(d) reticulene

## SECTION - B

Answer any FIVE questions
6. What is self-assembly? Give an example from nature.
7. How enzymes are differing from catalysts?
8. Draw the structure of penicillin V.
9. Write any four functions of proteins.
10. What is Host-Guest Chemistry? Give example.
11. Draw the structure of cortisone
12. Give examples for cathodic conversion electroorganic synthesis
SECTION - C

Answer any THREE questions
13. Discuss Sandmeyer reaction.
14. Elucidate the structure of chloramphenicol
15. Synthesis progesterone from stigmasterol and cholesterol
16. Write short notes on reversible and irreversible inhibition.
17. Explain any three factors which affecting electroorganic synthesis.

> SECTION - D

## Answer any TWO questions

$(2 \times 10=20)$
18. i) What is diazotization? Briefly mention the applications of diazonium salts. (7)
ii) Write an account of Hunsdiecker reaction.
19. i) What are nucleic acids? Write the functions of DNA. (3) ii) Discuss the primary and secondary structure of proteins. (4) and iii) Biological role of enzymes. (3)
20. i) Interpret the chemical relationship between oestrone, oestriol and oestradiol.(6)
ii) Write a note on anodic conversion. (4)

## SECTION - A

## Answer ALL questions

1. Adamson's rule deals with
(a) labelization of ligand (b)
(b) inner sphere
(c) outer sphere
(d) photophysical
2. Pick out the compound purification technique in the following
(a) solvent extraction
(b) DTA
(c) TGA
(d) DSC
3. Normal distribution is also classified as
(a) Gaussian distribution
(b) oisson distribution
(c) Bernoulli's distribution
(d)weighted average distribution
4. Systematic errors occur due to
(a) overuse of instruments
(b)careless usage of instruments
(c) both A and B
(d)human sight
5. The excited lifetime of fluorescence is
(a) $10^{-15}$
(b) $10^{-12}$
(c) $10^{-9}$
(d) $10^{-6}$

## SECTION - B

## Answer any FIVE questions

6. What is meant by actinometer?
7. Define solvent extraction technique.
8. What is principle of Differential Scanning Calorimetry.
9. What is mean by statistical method in research?
10. Define accuracy and precision.
11. Define the term sensor and mention its uses
12. Define significant number

## SECTION - C

Answer any THREE questions
13. Write short notes on Raman spectroscopy
14. Describe photo chemistry of chromium and cobalt complex
15. Define sampling technique. How do we analyze the results differently depending on the type of sampling?
16. You grow 20 crystals from a solution and measure the length of each crystal in millimeters. Here is your data: $9,2,5,4,12,7,8,11,9,3,7,4,12,5,4,10,9,6,9,4$. Calculate the standard deviation of the length of the crystals.
17. Explain the following terms. a. Lifetime b. Quantum yield (2.5+2.5)

## SECTION - D

## Answer any TWO questions

18. Sketch out the salient features of Internal Charge Transfer Mechanism (ICT) in fluorescent based sensors.
19. Explain in detail about Thermo gravimetric analysis and deferential Thermometric analysis technique with suitable examples.
20. What is mean by Gaussian distribution? Analyze the properties of Gaussian distribution with suitable example. Examine least square analysis. $(2+5+3)$

## SECTION - A

## Answer ALL questions

1. Which one of the following is a fermion?
(a) $\alpha$ Particle
(b) ${ }_{4} \mathrm{Be}^{2}$ nucleus
(c) Hydrogen atom
(d) deuteron
2. For which gas the ratio of specific heats $\left(\mathrm{Cp} / \mathrm{C}_{\mathrm{v}}\right)$ will be the largest?
(a) mono-atomic
(b) di-atomic
(c) tri-atomic
(d) hexa-atomic
3. Zeta potential depends on
(a) Dielectric constant of medium
(b) Charge density
(c) Distance between the parallel plates
(d) All of these
4. Silver-silver chloride reference electrode is made up of
(a) Copper wire coated with copper chloride
(b) Sodium wire coated with sod. Chloride
(c) Mercury with calomel
(d) Silver wire coated with silver chloride
5. Which of the following is not an application of conducting polymers?
(a) Rechargeable batteries
(b) Analytical sensors
(c) Electronics
(d) Adhesives

## SECTION - B

## Answer any FIVE questions

6. Define Maxwell-Boltzmann statistics.
7. What do you mean by population inversion?
8. What do you mean by boson gas?
9. How will you study reversible and quasireversible reactions reactions by CV
10. Draw the cyclic voltammogram of potassium ferrocyanide/potassium ferricyanide system
11. What are additives? Give examples.
12. Mention any two differences between emulsion and suspension polymerization.

## SECTION - C

## Answer any THREE questions

13. Write the difference between three statistics
14. Derive Bose-Einstein statistics
15. Discuss the instrumentation and any one application of polarography
16. Explain the theories of over-voltage
17. Write a note on Ziegler - Natta catalysts.

## SECTION - D

Answer any TWO questions
( $2 \times 10=20$ )
18. Briefly discuss the following double layer models (i) Guoy-Chapman model (ii) Stern model
19. Discuss in detail about the Einstein's and Debye's theories of heat capacities of solids
20. i) Explain the kinetics and mechanism of cationic polymerization. ii) Write a short note on use of fillers in plastics.

| Dept. of Chemistry | II Sessional Test |
| :--- | :---: |
| Vivekananda College | II Semester |
| Tiruvedakam West | Max. Marks: $\mathbf{5 0}$ |
| Date: $\mathbf{0 6} . \mathbf{0 3 . 2 0 1 9}$ | Time: $\mathbf{2}$ Hours |

Medicinal and Pharmaceutical Chemistry (33EP2A)

## SECTION - A

## Multiple choice questions:

1. The main bitter alkaloid present in neem oil is.....
(CO2)
(a) Nimibinin
(b) Margosine
(c) Sulfur
(d) Opium
2. Which one of the following diseases is a communicable?
(a) rickets
(b) amoebiasis
(c) diabetes
(d) cancer
3. Which of the following pair of disease is caused by virus?
(a) Rabies, Mumps
(b) Typhoid, Tetanus
(c) AIDS, Syphilis
(d) Cholera, Tuberculosis
4. Blood sugar level is maintained constant at a value of $\qquad$ mg of glucose $/ 100 \mathrm{ml}$
a) $50-100$
b) $60-110$
c) $70-120$
d) $80-130$
5. Which vitamin is absorbed best when taken with food.
(a) Vitamin A
b) Vitamin D c) Vitamin E
d) Vitamin K

## SECTION - B

## Answer ANY FIVE questions

6. How the acidity of stomach is controlled? (CO2)
7. Draw the structure of Azadirachtin?
8. Define infective diseases.
9. Define pharmacokinetics (CO1)
10. Define antiarrhythmic drugs. Write any two of its action.
11. What are anti-anginal agents.
12. What are the main sources for Vitamin C

## SECTION - C

## Answer any THREE questions

13. Discuss the active constituents of Neem.
14. Discuss the following terms (i) Insect borne diseases and (ii) air borne diseases
15. Discuss the following drug terminology
(i) pharmacology, (ii) pharmacognesy and (iiI) pharmacodynamics.
16. Write the source, structure, action, uses and adverse effects of Lysergic Acid Diethylamide

## SECTION - D

Answer any TWO questions
18. Explain in detail about the drug receptor and its biological responses
19. What are neoplastic agents? Write note symptoms, prevention and treatment of Cancer. (CO3)
20. Explain in detail about sedatives and hypnotics highlighting the role of barbiturates.

1. The increasing order of ionic radii is:
a) $\mathrm{O}^{2-}<\mathrm{N}^{3-}<\mathrm{S}^{2-}<\mathrm{F}^{-}$
b) $\mathrm{N}^{3-}<\mathrm{O}^{2-}<\mathrm{S}^{2-}<\mathrm{F}^{-}$
c) $\mathrm{F}^{-}<\mathrm{O}^{2-}<\mathrm{N}^{3-}<\mathrm{S}^{2-}$
d) $\mathrm{F}^{-}<\mathrm{S}^{2-}<\mathrm{O}^{2-}<\mathrm{N}^{3-}$
2. In a group of a periodic table, from top to bottom, ionization energy
a) increases b) decreases c) remains same d) none of the above
3. The increasing order of electron affinity among the following is
i) $1 s^{2} 2 s^{2} 2 p^{5}$
ii) $1 s^{2} 2 s^{2} 2 p^{4}$
iii) $1 s^{2} 2 s^{2} 2 p^{3} \quad$ iv) $1 s^{2} 2 s^{2} 2 p^{6} 3 s^{2} 3 p^{4}$
a) $\mathrm{i}<$ ii $<i i i<i v$
b) i<iv<ii<iii c) iv $<i i i<i i<i d)$ ii $<i i i<i<i v$
4. Mulliken scale of electronegativity is
a) IE+EA/2 b) IE-EA/2 c) IExEA/2 d) IE $\div E A / 2$
5. The order of repulsions between electron pairs is:
a) l.p-l.p>b.p-b.p>l.p-b.p
b) b.p-b.p>l.p-b.p>1.p-l.p
c) $1 . p-1 . p>1 . p-b . p>b . p-b . p$
d) l.p-b.p>l.p-l.p>b.p-b.p
6. The geometry of $\mathrm{CH}_{4}$ is
a) trigonal pyramidal b) trigonal planar c) tetrahedral d) none of the above
7. The number of lone pairs and bond pairs in $\mathrm{ClF}_{3}$ are
a) 2,3
b) 3,2
c) 4,1
d) 1,4
8.The total number of electron pairs in $\mathrm{XeF}_{4}$ is:
a) 3 b) 4 c) 6 d) 8
8. If the shape of the geometry is square planar, then its geometry is
a) $d s p^{2}$ b) $s p^{3}$ c) $s p^{3} d \quad$ d) $s p^{3} d^{2}$
9. The overall order of a reaction that has the rate expression, Rate $=k[A]^{1 / 2}[B]^{3 / 2}$ is:
a) 1
b) 1.5
c) 2
d) 2.5
10. The unit of rate constant for a second order reaction is:
a) $\mathrm{s}^{-1}$
b) $\mathrm{mol} \mathrm{L}^{-1} \mathrm{~s}^{-1}$
c) $\mathrm{mol}^{-1} \mathrm{~L} \mathrm{~s}^{-1}$
d) $\mathrm{mol}^{-2} \mathrm{~L}^{-2} \mathrm{~s}^{-1}$
11. $\mathrm{t}_{1 / 2}=0.693 / \mathrm{k}$, is the half life of which order of a reaction?
a) zero
b) first
c) second
d) third
12. The reactions in which the reactants require high amount of activation energy are generally:
a)slow
b) fast
c) instantaneous
d) none of the above
13. Collision theory is applicable to:
a) unimolecular reactions
b) bimolecular reactions
c) intramolecular reactions
d) intermolecular reactions
14. In DTA, thermal effects are caused by:
a) fusion b) crystalline structure inversions c) boiling and sublimations d)all the above
15. The property measured in TGA is
a) change in weight
b) change in pressure
c) change in temperature
d) heat evolved/absorbed
17.Polorography is to study the composition of dilute electrolytic solutions by plotting:
a) current-voltage curves
b) voltage-temperature curves
c) current-concentration curves
d) voltage-concentration curves
16. Claisen rearrangement is an example of $\qquad$ sigmatropic rearrangement:
a) $[2,3]$
b) $[2,4]$
c) $[1,5]$
d) $[3,3]$
17. Dields-alder reaction is a
a) $[2+2]$ thermal cyclization
b) $[4+2]$ photoaddition
c) $[4+2]$ cycloaddition
d) $[3+3]$ cycloaddition
18. ene reaction is a $\qquad$ electron electrocyclic reaction
a) $2 \pi$
b) $3 \pi$
c) $4 \pi$
d) $6 \pi$
19. 
20. 


a)

b)

c)

d)

2.
22.

a)

b)

c)

d)

3. Find out the major product
23.


a)

b)

c)

d)

24. Among which one is not used to prepare cis 1,2-diols
a) $\mathrm{OsO}_{4}$ b) $\mathrm{KMnO}_{4}$ c) Woodward's reagent d) Prevost Reagent
25. The basic addition behind the $\mathrm{OsO}_{4}$ oxidation is
a) $2 \pi+2 \pi$ b) $4 \pi+2 \pi$ c) $3 \pi+2 \pi$ d)both a \& b
26. Shapiro reaction is example for.....
a) Kinetically controlled b) Thermodynamically controlled c) radical reaction d) both b \& c
27. Tributyl tin hydride reagent is used for
a) Displacement of nitro compound b) Reduction of carbonyl group c) Oxidation of alcohol d) all the above
28. Which of the following reagent is used to convert $\alpha$-position to carbonyl compounds
a) $\mathrm{SeO}_{2}$ b) $\mathrm{OsO}_{4}$ c) $\mathrm{KMnO}_{4}$ d) $\mathrm{H}_{2} \mathrm{O}_{2}$
29. In Michael addition reaction, acceptors having
a) Withdrawing group b) Donating group c) Both a \& b d) Resonating group
30. Formylation of phenolic compounds with chloroform and alkali is
a) Riemer Teimann reaction b) Wurts reaction c) Suzuki coupling d) Wittig reaction
31. The following cyclic systems are said to be


a) Anti-aromatic: Aromatic b) Aromatic: Anti-aromatic c) Aromatic: Aromatic d) Anti-aromatic: Anti-aromatic
32. Among the following cations, which one is highly stable?
a)

b)

c)

d)

33. Which one will be undergone $\mathrm{S}_{\mathrm{N}} 2$ type reactions fastly in presence of base?
a)

b)

c)

d)


34. Find out the product




b)

c)

d)

35.
 $\xrightarrow{\mathrm{Br}_{2} / \mathrm{AcOH}}$ ?

a)

b)

c)

d)

36. In general E1 \& E2 elimination needs. $\qquad$ base
a) Stronger: Weaker b) Weaker: Stronger c) Weaker: Weaker d) Stronger: Stronger
37. Find out the intermediate in the following reaction

a) Carbocation b) Carbanion c) Carbene d) Benzyne
38. Acetone is less reactive than acetaldehyde due to...
a) Stabilized carbocation b) Unstabilized Carbocation c) Active hydrogens d) both a \& c
39. Triplet carbenes are. .. in nature
a) Diamagnetic b) Paramagnetic c) Partially paramagnetic d) Partially diamagnetic
40. Among the following naming reactions which one will undergo carbine based mechanisms?
a) Shapiro b) Mc-Murry Coupling d) Michael addition d) Bamford-Steven
41. Which of the following is a soft base?
a) SH
b) $\mathrm{Ag}^{+}$
c) $\mathrm{NH}_{3}$
d) $\mathrm{F}^{-}$
42. Acetic acid is an example of $\qquad$ .solvent.
a) Aprotic
b) Amphiphilic
c) Non-polar
d) Amphoteric
43. The point group of $\left[\mathrm{TiCl}_{6}\right]^{3-}$
a) $D_{4 d}$
b) $D_{3 d}$
c) $D_{4 h}$
d) $D_{3 h}$
44. The point group of trans- $\left[\mathrm{Cr}(\mathrm{en})_{2} \mathrm{~F}_{2}\right]^{+}$
a) $D_{4 d}$
b) $D_{3 d}$
c) $D_{4 h}$
d) $D_{3 h}$
45.The compound that is aromatic

I

II

III

IV
a) I
b) II
c) III
d) IV
46. The compound that gives precipitate on warming with aq. $\mathrm{AgNO}_{3}$ is
a)

b)

c)

d)

47. The following reaction goes through $\qquad$ intermediate.

a) Carbocation
b) Carbanion
c) Free radical
d) Carbene
48. The geometry of $\mathrm{I}_{3}{ }^{-}$is
a) Linear
b) Trigonal
c) Trigonal pyramidal
d) Square planar
49. The geometry of $\left[\mathrm{Br}_{3}\right]^{+}$is
a) Tetrahedral
b) Trigonal
c) Trigonal bipyramidal
d) Linear
50. The molecule $\mathrm{C}_{3} \mathrm{O}_{2}$ has a linear structure. The compound has
a) $4 \sigma$ and $4 \pi$ bonds
b) $3 \sigma$ and $2 \pi$ bonds
c) $2 \sigma$ and $3 \pi$ bonds
d) $3 \sigma$ and $4 \pi$ bonds

