Dept. of Chemistry	**III Sessional Test**
Vivekananda College	**II Semester**
Tiruvedakam West	**Max. Marks: 50**
Date: 09.04.2019	**Time : 2 Hours**

ORGANIC CHEMISTRY – II (33CT21)

SECTION – A

Multiple choice questions:

Answer ALL questions (5 x 1 = 5)

1) Tertiary alkyl halide are practically inert to substitution reaction by S_N2 mechanism Because of **(CO1)**

   a) steric hindress   b) inductive effect   c) instability   d) insolubility

2) The repulsion between the bonding electrons of one substituent and the bonding electrons of a nearby substituent is known an ………….. **(CO2)**

   a) Angle strain   b) Steric strain   c) Gauche strain   d) Torsional strain

3) The reagent used in Sharpless epoxidation is **(CO3)**

   a) DET, $Zn(O^iPr)_2$, ^tBuOOH b) DET, $Ti(O^iPr)_4$, ^tBuOOH

   c) DCC, $Ti(O^iPr)_4$, ^tBuOH d) DET, $Ti(O^iPr)_4$, CH_3COOH

4) Which one of the following will act as catalyst for Birch reduction? **(CO4)**

   a) DDQ   b) DCC   c) Na/NH_3 in MeOH   d) Zn/HCl

5) The active part present in Baker's yeast to reduce a carbonyl group into a hydroxyl group is

   a) Zn^{2+} b) Aminoacids   c) Polyphenols   d) Enzyme **(CO5)**

SECTION – B

Answer any FIVE questions (5 x 2 = 10)

6) Define pyrolytic elimination. **(CO1)**

7) What are Non classical carbocations? **(CO1)**

8) What are atropisomers? Give one example. **(CO2)**

9) Write Simmons-Smith reaction. **(CO3)**

10) What happens when β–keto acid is heated at room temperature? **(CO3)**

11) What are differences between Stobbe and Dieckman Condensation? **(CO4)**

12) Write down the important applications DDQ in organic portal. **(CO5)**

SECTION – C

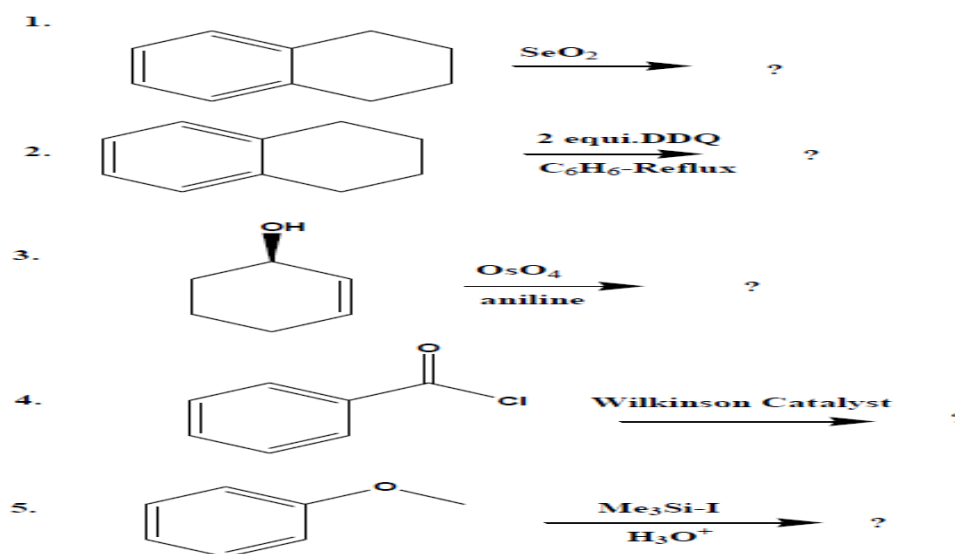**Answer any THREE questions**   **(3 x 5 = 15)**

13) Explain in detail Neighbouring group participation with example?   **(CO1)**

14) Discuss the conformational analysis of decalins.   **(CO2)**

15) Write the mechanism of i) Benzoin condensation ii) Mannich reaction   **(CO3)**

16) Describe Robinson annulations with chemical reaction.   **(CO4)**

17) Sketch out the mechanism of Wilkinson's Catalyst on general alkene reduction.   **(CO5)**

SECTION – D

Answer any TWO questions   **(2 x 10 = 20)**

18) i) Discuss the synthetic utility of Grignard reagents in organic synthesis. **(5)**   **(CO3)**

     ii) Write short notes on i) Hydroboration ii) Aldol condensation   **(5)**

19) Give mechanism of Birch reduction and Fischer Indole synthesis.   **(CO4)**

20) Find out the products.   **(CO5)**

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I M.Sc. CHEMISTRY

Dept. of Chemistry   **III Sessional Test**
Vivekananda College   **II Semester**
Tiruvedakam West   **Max. Marks: 50**
Date: 10.04. 2019   **Time: 2 Hours**

INORGANIC CHEMISTRY -II (33CT22)

SECTION – A

Answer ALL questions   **(5 x 1 = 5)**

1. The pair of compounds having metals in their highest oxidation state is   **(CO1)**
   (a) MnO_2, $FeCl_3$ (b) $[MnO_4]^-$, CrO_2Cl_2
   (c) $[Fe(CN)_6]^{3-}$, $[Co(CN)_3]$ (d) $[NiCl_4]^{2-}$, $[CoCl_4]^-$
2. Using crystal field theory, identify from the following complex ions that shows same μ_{eff} (spin only)
   values: (A) $[CoF_6]^{3-}$, (B) $[IrCl_6]^{3-}$, (C) $[Fe(H_2O)_6]^{2+}$,   **(CO2)**
   (a) A and B   (b) B and C   (c) A and C   (d) A, B and C
3. The spectroscopic ground state symbol and the total number of electronic transition of $[V(H_2O)_6]^{3+}$ are:
                                                                                      (CO3)
   (a) $^3T_{1g}$ and 2   (b) $^3A_{2g}$ and 3   (c) $^3T_{1g}$ and 3   (d) $^3A_{2g}$ and 2
4. The expected spin-only magnetic moments for $[Fe(CN)_6]^{4-}$ and $[FeF_6]^{3-}$ respectively are   **(CO4)**
   (a) 1.73 and 1.73 B.M.   (b) 1.73 and 5.92 B.M.
   (c) 0.0and 1.73 B.M.   (d) 0.0 and 5.92 BM.
5. The important ore of thorium is   **(CO5)**
   (a) Pitch blende   (b) Gadolinite   (c) Vanadite   (d) Monazite

SECTION – B

Answer any FIVE questions   **(5 x 2 = 10)**

6. Draw the splitting energy diagram for square planar complexes.   **(CO2)**
7. Calculate the magnetic moment of $[Zn(NH_3)_6]^{2+}$.   **(CO2)**
8. The complex $[Ti(H_2O)_6]^{3+}$ absorbs at 12000 cm^{-1}. Calculate the value of Δ_o. **(CO3)**
9. Compare Orgel diagram and Tanabe-Sugano diagram.   **(CO3)**
10. What is meant by quenching of magnetic moment?   **(CO4)**
11. What are actinides? Give their electronic configurations.   **(CO5)**
12. List out the important uses of thorium.   **(CO5)**

SECTION – C

Answer any THREE questions   **(3 x 5 = 15)**

13. Account on spinels and inverse spinels with suitable examples.   **(CO2)**
14. Briefly discuss the concept of chirality in coordination complexes.   **(CO1)**
15. Explain Tanabe-Sugano diagram for d^6 ion.   **(CO3)**
16. Define following with examples.
    (i) paramagnetism   (ii) diamagnetism   (iii) ferromagnetism   **(CO4)**
17. Compare and explain the relative tendencies of lanthanides and actinides to form complexes.   **(CO5)**

SECTION – D

Answer any TWO questions   **(2 x 10 = 20)**

18. Discuss the consequences of the following (i) CFSE   (ii) Jahn-Teller distortion.   **(CO2)**
19. (i) Calculate 10 Dq value and assign the electronic spectrum of $[Co(H_2O)_6]^{2+}$. (5 mark)   **(CO3)**
    (ii) Account on nephelauxetic effect and its ratio. (5 mark)
20. Describe the methods which have been used to separate the isotopes of uranium. Explain the difficulties.
                                                                                      (CO5)

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Dept. of Chemistry	**III Sessional Test**
Vivekananda College	**II Semester**
Tiruvedakam West	**Max. Marks: 50**
Date: 11 .04. 2019	**Time: 2 Hours**

PHYSICAL CHEMISTRY -II (33CT23)

SECTION – A

Multiple choice questions: (5 x 1 = 5)

1. The value of α which ψ^2 is orthogonal to $\psi1$ is (CO1)
(a) 2 (b) 1 (c) – 1 (d) – 2

2. Which of the following statements about a plot of V_0 vs. [S] for an enzyme that follows Michaelis-Menten kinetics is false? (CO4)
   (a.) Km is the [S] at which $V_0 = \frac{1}{2} V_{max}$. (b.) The shape of the curve is a hyperbola.
   (c) As [S] increases, the initial velocity of reaction, V_0, also increases.
   (d) At very high [S], the velocity curve becomes a horizontal line that intersects the y-axis at Km.

3. The kinetic energy of the photoelectron energies is dependent on _____ of the atom, which makes XPS useful to identify the oxide state. (CO3)
   a) mass b) charge c) chemical environment d) volume

4. Auger electron spectroscopy can be used for surface chemical analysis in a way similar to which of the following? (CO3)
   a) ESCA b) SIMS c) ISS d) Ion spectroscopy

5. The free change in a photochemical reaction is (CO5)
   a) Always zero b) always negative c) always positive d) may be positive or negative.

SECTION – B

Answer ANY FIVE questions (5 x 2 = 10)

6. The term symbol for the ground state of N atom is $^4S_{3/2}$ .Determine the electronic configuration for this element. (CO1)
7. Write any four characteristics of catalytic reactions. (CO4)
8. What is photoelectric effect? (CO3)
9. What is meant by Auger effect? (CO3)
10. State mutual exclusion principle. (CO3)
11. Classify the functional groups on P^{ka} when they are suggested to excitation. (CO5)
12. Define Eximers and Exciplexes. (CO5)

SECTION – C

Answer any THREE questions (3 x 5 = 15)

13. Derive the term symbol for P^2 configuration. (CO1)
14. Discuss the kinetics and mechanism of enzyme- catalyzed reactions. (CO4)
15. Give a brief account of Koopman's theorem. (CO3)
16. Explain the basic principles of photoacoustic spectroscopy. (CO3)
17. Give one application of photochemistry. (CO5)

SECTION – D

Answer any TWO questions (2 x 10 = 20)

18. (a) Derive B.E.T adsorption isotherm and its applications (6) (CO4)
    (b) State and explain Huckel –pi electron theory (4) (CO1)
19. Discuss the ESCA in photoelectron spectroscopy. (CO3)
20. Illustrate flash photolysis technique. (CO5)

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II-M.Sc CHEMISTRY

Dept. of Chemistry   **III Sessional Test**
Vivekananda College   **IV Semester**
Tiruvedakam West   **Max. Marks: 50**
Date: 11.04.2019   **Time: 2 Hours**

ORGANIC CHEMISTRY -IV(33CT41)

SECTION –A

Answer ALL questions   **(5 x 1 = 5)**

1. The change of optical rotation with wavelength is known as
   a) cotton effect   b) ORD   c) circular dichroism   d) optical effect
2. A base peak in the electron impact mass spectrum of acetophenone
   a) 120   b) 105   c) 77   d) 65
3. A nucleotide consists of a
   a) Sugar, a base and a phosphate b) Sugar and a phosphate   c) Paired bases
   d) Sugar, a base and three phosphates
4. Which of the following is not naturally occurring zeolite?
   a) Na^+ b) Al^{+3} c) Ca^{+2} d) Si^{+4}
5. The fullerenes are composed with ---------
   a) Graphene sheets   b) Graphite   c) Lead   d) Other carbon materials

SECTION – B

Answer any FIVE questions   **(5 x 2 = 10)**

6. What is the structure of zeolite?
7. Draw the structure of ascorbic acid.
8. Write any two important reactions of benzofuran.
9. Define α-haloketone rule.
10. Compare ORD and CD.
11. What are cyclodextrins? Mention its uses
12. Draw the structure of common crown ethers: 12-crown-4, 15-crown-5 and 18-crown-6.

SECTION –C

Answer any THREE questions   **(3 x 5 = 15)**
13. Elucidate the structure of fullerenes.
14. Write the synthesis of vitamin E.
15. Discuss MacLafferty rearrangement with an example.
16. Write short note on molecular recognition.
17. Explain octant rule. Give any application of octant rule

SECTION – D

Answer any TWO questions   **(2 x 10 = 20)**
18. Writebriefly on i) Dentimers and its uses ii) β – cyclodextrin
19. i) Elucidate the structure of penicillin V. (5) ii) Write the application of Zeolites.(5)
20. Explain the following with examples: (i) parent peak   (ii) base peak
    (iii) isotopic peak (iv) metastable peak

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Dept. of Chemistry	**III Sessional Test**
Vivekananda College	**IV Semester**
Tiruvedakam West	**Max. Marks: 50**
Date: 09.04. 2019	**Time: 2 Hours**

INORGANIC CHEMISTRY-IV (33CT42)

SECTION – A

Answer ALL questions (5 x 1 = 5)

1. Ruthenium bipyridyl complexes exhibit -----------
   (a) MLCT   (b) LMCT   (c) MMCT   (d) LLCT
2. ----- technique is measure of mass of sample as the temperature changes
   (a) Thermo gravimetric analysis   (b) differential thermal analysis
   (c) Differential scanning calorimetry   (d) Raman
3. Match the shape to the formula. Which pairing is correct?
   (a)$[BrF_2]^+$; non-linear   (b)$[ICl_4]^-$; tetrahedral
   (c)IF_5; trigonalbipyramidal   (d) BrF_3; trigonal pyramidal
4. The line described by the regression equation attempts to
   (a)pass through as many points as possible. (b) pass through as few points as possible.
   (c) minimize the number of points it touches.
   (d) minimize the squared distance from the points.
5. The point at which the total emission of a sample doesn't change for a given wavelength is called as
   (a) Isobestic   (b) Isothermal   (c) Isoemissive   (d) both a & c

SECTION – B

Answer any FIVE questions (5 x 2 = 10)

6. Define Chemical actinometer
7. What is meant by Craig extraction?
8. Define oxidative and reductive quenching?
9. Differentiate between inter and pseudohalogens.
10. Define rejection of data.
11. Draw the structure of any two oxy-acids of halogens.
12. What is meant my TURN-ON and TURN –OFF fluorescent sensors

SECTION – C

Answer any THREE questions (3 x 5 = 15)

13. Explain in detail photochemistry of organometallic complex with example?
14. Describe Photo isomerisation   reactions?
15. Discuss relation between structure and reactivity of oxy-acid of nitrogen.
16. Define following terms (i) linear regression and (ii) Gaussian distribution
17. Shortly explain the FRET mechanism.

SECTION – D

Answer any TWO questions (2 x 10= 20)

18. Explain the salient features of Ni^{2+} sensor using an organic probe.
19. Explain in detail about   TGA, DTA and DSC technique with example?
20. Given an account of oxy-acids of phosphorus and sulphur.

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II-M.Sc. CHEMISTRY

Dept. of Chemistry   **III Sessional Test**
Vivekananda College   **IV Semester**
Tiruvedakam West   **Max. Marks: 50**
Date: 10.04.2019   **Time: 2 Hours**
Physical Chemistry-IV (33CT43)

SECTION – A

Answer ALL questions   **(5 x 1 = 5)**

1. The formula of relating entropy with thermodynamic probability w is given by
   (a) RlnW   (b) RlnM   (c) RlnX   (d) RlnS

2. Consider a system having three energy levels with energies 0, 2 and 3ε, with respective degeneracies of 2, 2 and 3. Four bosons of spin zero have to be accommodated in these levels such that the total energy of the system is 10ε . The number of ways in which it can be done is _____.
   (a) 18   (b) 12   (c) 15   (d) 2

3. In World War II, parachutes were made by
   (a) Polymers   (b) nylon   (c) caprolactum   (d) all of them

4. The equation which relates current density and over-voltage is known as
   (a) Tafel equation   (b) Ilkovic equation
   (c) Nernest equation   (d) Butler-Volmer equation

5. The limiting current in a linear sweep voltammogram is related to
   (a) The standard reduction potential for the redox couple under investigation
   (b) The reduction potential of the reference electrode
   (c) The point at which concentration polarization begins
   (d) The concentration of the analyte of interest

SECTION – B

Answer any FIVE questions   **(5 x 2 = 10)**

6. Write any two characteristics in Boltzmann distribution law.
7. Define specific heat capacity of solids.
8. Define the term conducting polymers.
9. Differentiate between natural and synthetic polymers
10. What are the importances of Tafel plot?
11. Mention any two applications of over-voltage
12. Write the advantages and disadvantages of fuel cells

SECTION – C

Answer any THREE questions   **(3 x 5 = 15)**

13. Derive Boltzmann – Plank equation
14. Explain the law of equipartion of energy
15. Write short notes on Ziegler-Natta catalysis
16. Discuss Stern model of double layer
17. Discuss the instrumentation and any one application of cyclic voltammogram

SECTION – D

Answer any TWO questions   **(2 x 10= 20)**

18. Derive the statistical expression for equilibrium constant from partition function
19. What are the types of over voltage? and discuss the theories of over-voltages
20. How is molecular weight determined by light scattering and viscosity methods?

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I M.Sc., CHEMISTRY

Dept. of Chemistry   **III Sessional Test**
Vivekananda College   **II Semester**
Tiruvedakam West   **Max. Marks: 50**
Date: 12.04. 2019   **Time: 2 Hours**
Medicinal and Pharmaceutical Chemistry   (33EP2A)

___

SECTION – A

Multiple choice questions: **(5 x 1 = 5)**

1. The organisms that causes disease are called   **(CO1)**
   (a) vectors   (b) pathogens (c) symptoms   (d) reservoirs.
2. The phytochemical constituentpresent in *tulsi*   **(CO2)**
   (a) Eugenol b) Reserpine c) Morphine d) Quinine
3. Chloramphinicol acts agains gram_____ and bacteria.   **(CO3)**
   (a) positive   (b) negative   (c) both a and b   (d) virus
4. The drugs used in the treatment of angina pectoris is   **(CO4)**
   (a) Nitrites (b) Sulphites (c) Phosphates (d) Chlorates
5. Which metal is used to maintain the plasma concentration of vitamin A?   **(CO5)**
   (a) Al (b) Fe (c) K (d) Zn

SECTION – B

Answer ANY FIVE questions   **(5 x 2 = 10)**
6. Write any five active pharmacologically active principles in plants. **(CO2)**
7. What are chemotherapeutic drugs and give one example?   **(CO2)**
8. Define diseases.   **(CO1)**
9. Give any three points about factors affecting absorption of drugs.   **(CO1)**
10. Define Psychedlic drugs   **(CO4)**
11. Write one similarity and one difference between sedative and hypnotic drugs **(CO4)**
12. What are the therapeutic usages of Vitamin B2?   **(CO5)**

SECTION – C

Answer any THREE questions   **(3 x 5 = 15)**

13. Discuss the medicinal properties of Tulsi.   **(CO2)**
14. Write short note on Assay of drugs.   **(CO1)**
15. Given an account of following terms (i) Therapeutic index, (ii) drug analysis and
    (iii) design of drugs   **(CO1)**
16. Write a short note on Vasodilator drugs.   **(CO4)**
17. List out the classifications of vitamins.   **(CO5)**

SECTION – D

Answer any TWO questions   **(2 x 10 = 20)**

18. Discuss symptoms, prevention and treatment of Cancer.   **(CO3)**
19. Illustrate lipid profile.   **(CO4)**
20. Explain in detail about the source, deficiency and therapeutic uses of Vitamin A2 and B1. **(CO5)**

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II M.Sc Chemistry
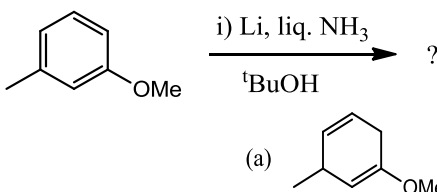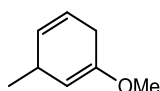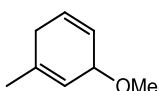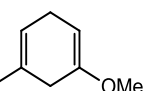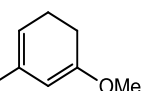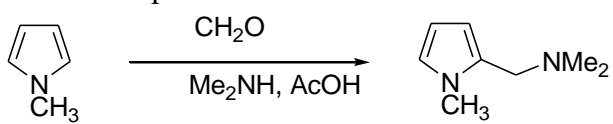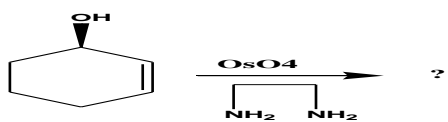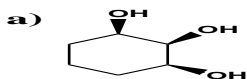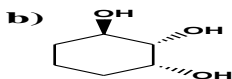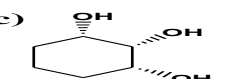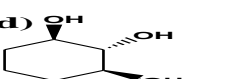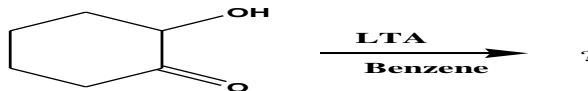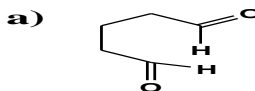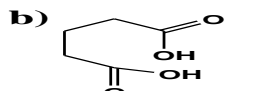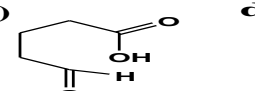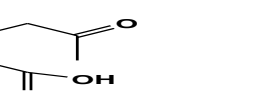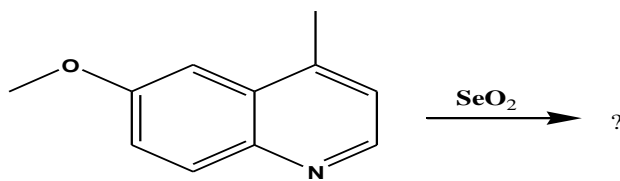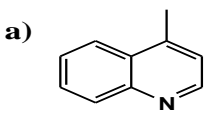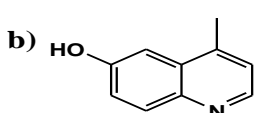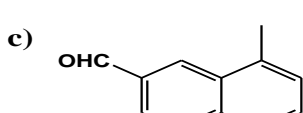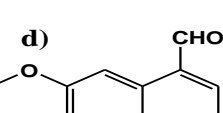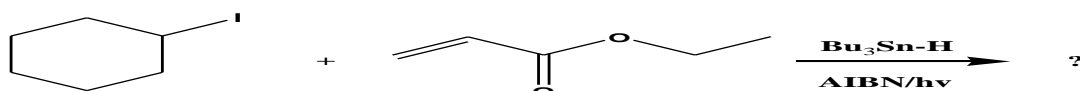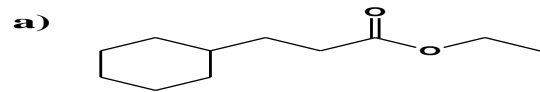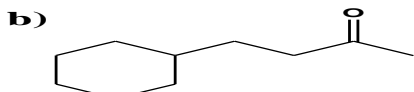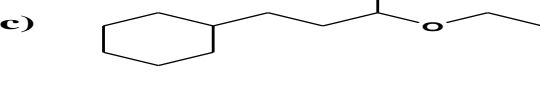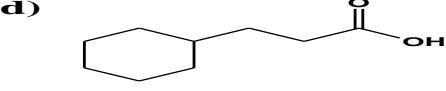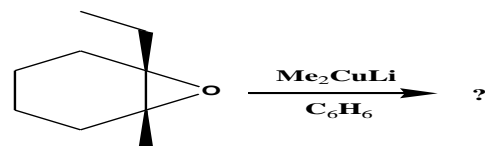
Dept. of Chemistry   **III Sessional Test**
Vivekananda College   **Semester IV**
Tiruvedakam West   **Max. Marks: 50**
Date: 12.04. 2019   **Time: 2 Hours**
CHEMISTRY FOR NATIONAL ELIGIBILTY TEST- (33EP4B)

1. In fisher representation, 180^0 in plane rotation produces _____.
 a) homomers   (b) enantiomers   (c) diastereomers   (d) None of the above
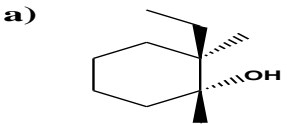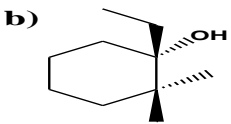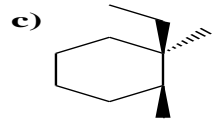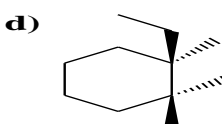
2. Meso compounds are always
  (a) optically active   (b) optically inactive   (c) optically stable   (d) optically unstable

3. The true statement among the following is:
   (a) all the asymmetric centre are streogenic, but all stereogenic centre are not asymmetric
   (b) all the asymmetric centre are not streogenic, but all stereogenic centre are asymmetric
   (c) asymmetric centre and stereogenic centre are same for all the molecules
   (d) asymmetric centre and stereogenic centre are different for all molecules

4. 100g of an optically active compound was dissolved in 1 litre of a solvent. If path length is 100cm, optical rotation is $+1000^0C$, then the specific rotation is:
 (a) $+10^0$ (b) $+100^0$ (c) $+1000^0$ (d) $+10000^0$

5. If single crystal is formed by unequal amounts of enantiomers, then the solid is called:
  (a) epimers   (b) conglomerate   (c) racemic compound   (d) pseudo racemic

6. The number of asymmetric centres in cholesterol is:
   (a) 8   (b) 10   (c) 12   (d) 14

7. In the given compound, C_1 & C_2 corresponds to _____ & _____ configuration respectively

COOH
H —|2|— OH
HO —|1|— H
COOH
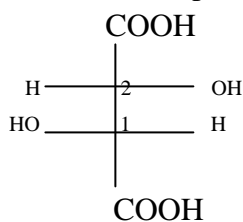
  (a) R,S   (b) S,R   (c) R,R   (d) S,S

8. The schrodinger- time independent equation can be written as:
 a) $H\Psi = E\Psi$ (b) $H\Psi= (E-V)\Psi$ (c) $H\Psi=(E+V)\Psi$ (d) $H\Psi+E\Psi=0$

9. The debroglie wavelength (λ) of a particle having kinetic E_k is given by:
  (a) $h/\sqrt{E_k}$ (b) $h/\sqrt{2mE_k}$ (c) $h/\sqrt{m E_k}$ (d) $h/\sqrt{3m E_k}$

10. The effective nuclear charge experienced by 3p electron of chlorine is:
 a) 6.10   (b) 7.90   (c) 9.90   (d) 10.9

11. The number of nodal points of a 3p orbital is
  (a) 1   (b) 2   (c) 3   (d) 4

12. The only hydrogen series found in the visible region of electromagnetic spectrum is
  (a) lyman   (b) balmer   (c) paschen   (d) brackett

13. The electric dipole allowed transition among the following is
 a) $^3S \rightarrow {}^3D$ b) $^3S \rightarrow {}^3P$ (c) $^3S \rightarrow {}^1D$ (d) $^3S \rightarrow {}^1F$

14. The term symbol for ground state of fluorine atom is:
(a) $^3P_0$ (b) $^4P_{3/2}$ (c) $^1P_1$ (d) $^2P_{1/2}$

15. The mulliken symbol for the spectroscopic state G is
   (a) E_g+T_{2g} (b) A_{2g}, T_{1g},T_{2g} (c) $E_g,2T_{1g},T_{2g}$ (d) A_{1g},E_g,T_{1g},T_{2g}

16. The total number of microstates for 6 identical particles, with their occupation numbers {1,2,3} in three states is:

    (a) 6   (b) 24   (c) 36   (d) 60

17. The spin only magnetic moment of $[MnF_6]^{3-}$ is _____

    (a) 1.73 BM   (b) 2.83 BM   (c) 3.87 BM   (d) 4.90 BM

18. In retrosynthesis, the site of disconnection is denoted by:

    (a) straight line   (b) curved line   (c) wiggly line   (d) hook line

19. Which of the following compounds act as protecting group for alcohols:

    (a) ethers   (b) acetals   (c) ketals   (d) all of these

20. A situation in which a synthon of polarity opposite to that normally associated with the required functional group must be used is called:

    a) resolution   (b) asymmetric induction   (c) umpolung   d) protection

21. Which of the following is true regarding the stability of compounds?

    (a) aromatic < non-aromatic = anti-aromatic   c) aromatic > anti-aromatic > non-aromatic

    (b) aromatic > non-aromatic > anti-aromatic   d) anti-aromatic > non-aromatic > aromatic

22. The major product formed in the following reaction

23. The electric dipole allowed transition among the following is

    (a) $^3S \rightarrow {}^3D$ (b) $^3S \rightarrow {}^3P$ (c) $^3S \rightarrow {}^1D$ (d) $^3S \rightarrow {}^1F$

24. In the mass spectrum of 1,2-dichloroethane, approximate ratio of peaks at m/z values 98, 100, 102 will be

    (a) 3 : 1 : 1   (b) 9 : 6 : 1   (c) 1 : 1 : 2   (d) 1 : 2 : 1

25. The calculated value of magnetic moment of V^{3+} is

    (a) 1.73 BM   (b) 2.83 BM   (c) 3.87 BM   (d) 4.90 BM

26. The number of lone pairs are identical in the pairs

    (a) XeF_4, ClF_3 (b) XeO_4, ICl_4^- (c) XeO_2F_2, ICl_4^- (d) XeO_4, ClF_3

27. The following conversion is an example of

    (a) Arndt-Eistert homologation   (b) Mannich reaction

    (c) Michael addition   (d) Chichibabin amination reaction

28. The bond order of N_2^+ is

    (a) 3   (b) 3.5   (c) 2   (d) 2.5

29. The molecule that will show Raman spectrum, but not IR spectrum, among the following is

    (a) H_2 (b) HCl   (c) BrCl   (d) CS_2

30. Which of the following exhibits rotational spectra?

    (a) CO   (b) N_2 (c) CO_2 (d) H_2

31.

OsO4 / NH2-NH2 (over arrow) → ?

(structure: cyclohexenol with OH)

a)   b)   c)   d) (structures with OH groups)

32.

(2-hydroxycyclohexanone structure) —LTA / Benzene→ ?

a)   b)   c)   d) (structures)

33.

(6-methoxy-4-methylquinoline structure) —SeO2→ ?

a)   b) HO...   c) OHC...   d) CHO / methoxy quinoline

34.

(cyclohexyl iodide) + (ethyl acrylate) —Bu₃Sn-H / AIBN/hν→ ?

a)   b)   c) OH   d) OH

35.

(spiro epoxide with methyl structure) —Me₂CuLi / C₆H₆→ ?

a)   b) OH   c)   d) (structures)

36. In SeO₂ oxidation, which alcohol is major?
   (a) E   (b) Z   (c) 1^0 (d) 2^0

37. Opening of epoxide with Grignard reagent is … type of reaction
   (a) E_1 (b) S_N1 (c) E_2 (d) S_N2

38. OsO$_4$ oxidation is generally enhanced by

    (a) 2^{0}amine   (b)1^{0}amine   (c)3^{0}amine   (d) both b & d

39. Sarett's reagent is

    (a) CrO$_3$+ Pyridine   (b)CrO$_3$+ Pyridine+ DCM

    (c)CrO$_3$+ Pyridine+ H$_2$SO$_4$ (d)CrO$_3$+ Pyridine   + PDC

40. Among the following, which one is not acid labile

    (a) Acetals   (b) Epoxides   (c) Lactones   (d) Ethers

41. The following molecule is said to be
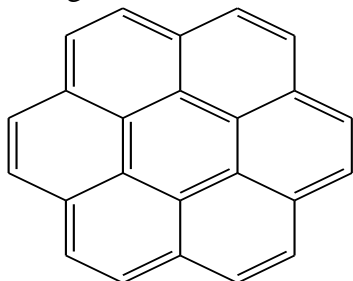
    (a) Anti-aromatic   (b) Aromatic   (c) Anti –aromatic but planar   (d) Planar only

42. Phenathracene is

    (a) Anti-aromatic   (b) Aromatic   (c) non-aromatic   (d) Perfect planar only

43. In polar solvents, the order of nucleophilicty for the following series are

    I⁻, EtO⁻, CH$_3$-COO⁻, CH$_3$-CH$_2$-COO⁻,

    (a) IV>III>II>I   (b)III>IV>I>II   (c) I>II>IV>III   (d)I>IV>III>II

44. The order of basicity for the following series are

    I⁻, EtO⁻, CH$_3$-COO⁻, CH$_3$-CH$_2$-COO⁻,

    (a) IV>III>II>I   (b)I>II>IV>III   (c) III>IV>I>II   (d)II>IV>III>I

45. Stability order of free radicals increases as we move from primary to tertiary free radicals, due to

    (a) + I effect   (b) - I effect   (c) + M effect   (d) –M effect

46. Which one is more stable carbanion
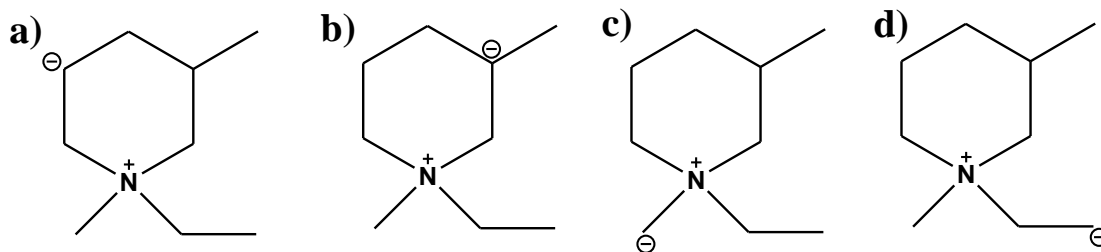
47. The bond angle range in triplet carbene is

    (a) 100-110^0 (b) 130-150^0 (c) 120-160^0 (d) 180-192^0

48. In E2 elimination, the loss of the leaving group and the removal of the proton is …. type mechanism

    (a) Concerted   (b) Stepwise   (c) both a & b   (d) none of the above

49. Which of the following reaction will give more substituted and regioselective alkenes

    (a) S$_N$1   (b) E1   (c) S$_N$2   (d) E2

50. Find the odd man out

   (a) Michael Addition   (b)Aldol condensation   (c)Knoevenagle reaction   (d)Benzoin condensation

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