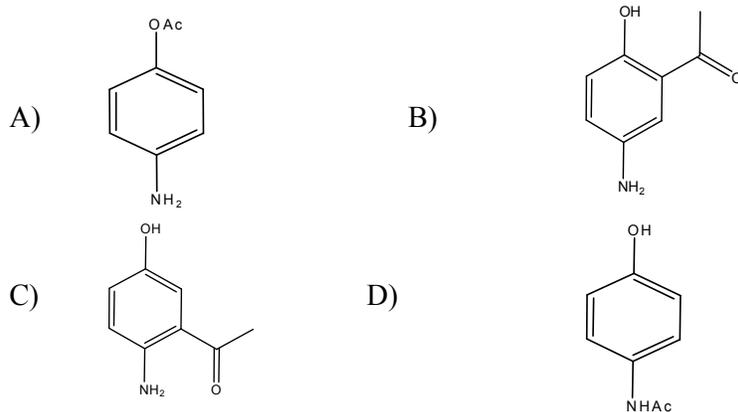
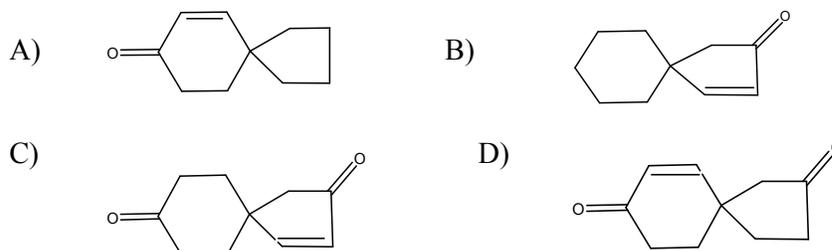


1. Reaction of p-aminophenol with one equivalent of acetyl chloride in the presence of pyridine generates



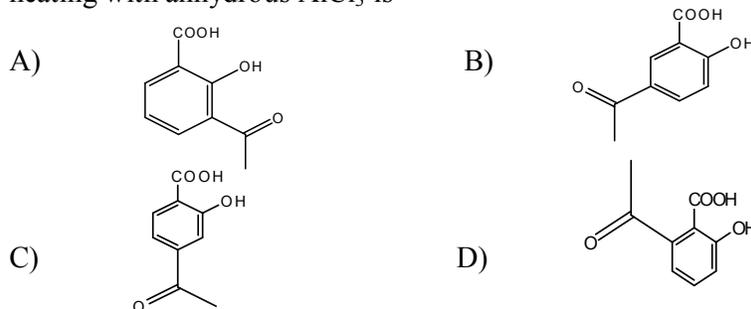
2. Paterno-Buchi reaction involves a
- Photochemical 4+2 cycloaddition
 - Thermal 4+2 cycloaddition
 - Photochemical 2+2 cycloaddition
 - Thermal 2+2 cycloaddition

3. The compound among the following, which can exhibit optical activity, is



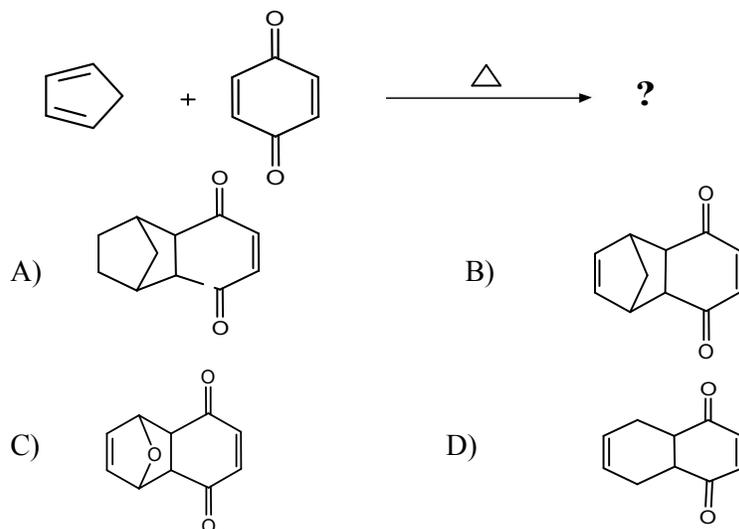
4. Which of the two compounds will be most readily separated by TLC?
- Naphthalene and anthracene
 - Acetonephenone and 4-methylacetophenone
 - Naphthalene and acetonephenone
 - Benzoic acid and 3-methylbenzoic acid

5. The major product of the acetylation of salicylic acid with $\text{Ac}_2\text{O}/\text{H}^+$ followed by heating with anhydrous AlCl_3 is



6. A chemist plans to prepare 1-bromo-2-pentene by the following reaction:
 $\text{CH}_3\text{CH}_2\text{CH}=\text{CHCH}_3 + \text{NBS (in CCl}_4) \longrightarrow \text{CH}_3\text{CH}_2\text{CH}=\text{CHCH}_2\text{Br}$
 This plan is not likely to work because:
- There will be no reaction
 - $\text{CH}_3\text{CHBrCH}=\text{CHCH}_3$ will also form
 - $\text{CH}_3\text{CH}_2\text{CHBrCHBrCH}_3$ will form
 - $\text{BrCH}_2\text{CH}_2\text{CH}=\text{CHCH}_3$ will form
7. Which starting material, upon reaction with the set of reagents (1) $\text{Br}_2/\text{FeBr}_3$, (2) Mg/ether and (3) CO_2 will give benzoic acid?
- Phenol
 - Benzene
 - Aniline
 - Acetophenone
8. Stigmasterol contains
- Two hydroxyl groups and two double bonds
 - One hydroxyl group and two double bonds
 - Two hydroxyl groups and three double bonds
 - One hydroxyl group and one double bond
9. The ozonolysis products of zingiberine are:
- Acetaldehyde, acetic acid and laevulic acid
 - Acetone, laevulic acid and succinic acid
 - Acetone, malonic acid and succinic acid
 - Acetaldehyde, phthalic acid and succinic acid

10. Which is the product formed in the following reaction?



11. The proton NMR spectrum of 2-bromo-2-methylpropane consists of -----.
- Singlet, triplet and a quartet
 - Doublet and septet
 - Two quartets and one doublet
 - Singlet

19. Match **List I** with **List II** correctly and select your answer using the codes given below:

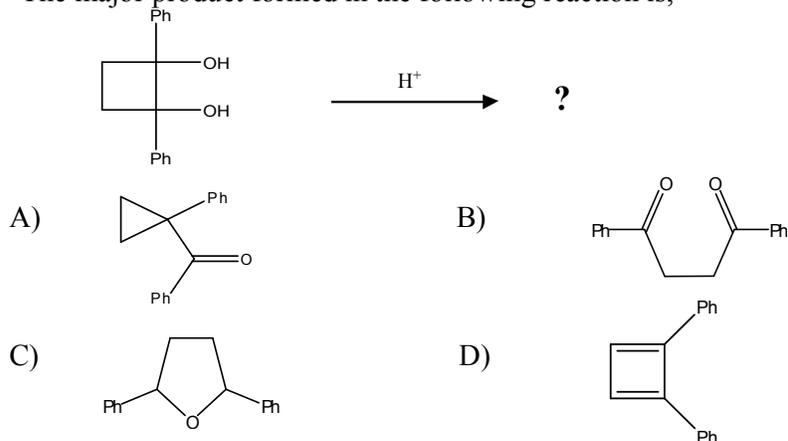
- | | |
|---------------------------|--------------------|
| (a) Structural isomerism | 1. Polarized light |
| (b) Nicol prism | 2. Maleic acid |
| (c) Propane dioic acid | 3. Tautomerism |
| (d) Geometrical isomerism | 4. Malonic acid |

	a	b	c	d
A)	1	3	2	4
B)	3	1	4	2
C)	1	2	4	3
D)	2	1	3	4

20. A carboxylic acid group can be reduced to a primary alcohol by

- A) LiAlH_4 B) Zn-Hg/HCl C) $\text{N}_2\text{H}_4/\text{NaOH}$ D) Sn/HCl

21. The major product formed in the following reaction is,



22. Which one of the following is not an example of Cannizzaro's reaction?

- A) $\text{C}_6\text{H}_5\text{CHO} + \text{HCHO} \longrightarrow \text{C}_6\text{H}_5\text{CH}_2\text{OH} + \text{HCOOH}$
- B) $\text{CH}_3\text{CHO} + \text{H}_3\text{CCHO} \longrightarrow \text{CH}_3\text{CH}_2\text{OH} + \text{H}_3\text{CCOOH}$
- C) $\text{C}_6\text{H}_5\text{COCHO} \longrightarrow \text{C}_6\text{H}_5\text{CHOHCOOH}$
- D) $2\text{CCl}_3\text{CHO} \longrightarrow \text{CCl}_3\text{CH}_2\text{OH} + \text{CCl}_3\text{COOH}$

23. Triglycerides which make up natural oils and fats can be broken down to glycerol and fatty acids using

- A) Diastase B) Lipase C) Trypsin D) Pepsin

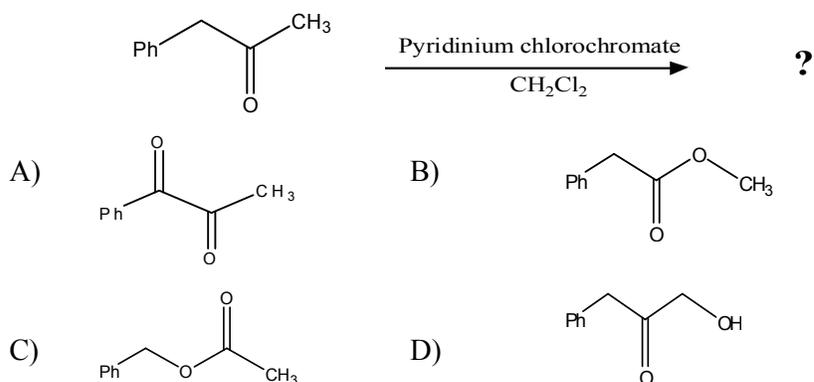
24. All the following methods would be expected to form a ketone except

- A) Dehydrogenation of a secondary alcohol
- B) Heating Ca-salt of an acid
- C) Acid hydrolysis of an alkyl cyanide
- D) Reaction of an acid chloride with Grignard reagent

25. Total number of isomers possible for the formula $C_4H_{10}O$ of which three are ether is
 A) 5 B) 4 C) 3 D) 7

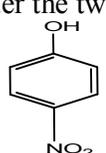
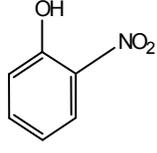
26. Iodoform reaction is answered by
 I. Acetophenone
 II. Benzophenone
 III. 2-Propanol
 IV. Acetone
 Of these....
 A) III & IV B) I & II C) I, II & III D) I, III & IV

27. The product of the following reaction is,



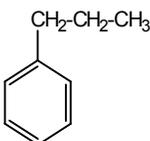
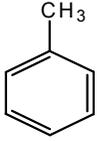
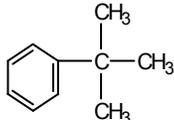
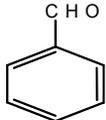
28. Which of the following partition functions contribute maximum to the total molecular partition function?
 A) Electronic B) Translational
 C) Vibrational D) Rotational

29. Dacron is
 A) An addition polymer with a benzene ring in every repeating unit
 B) Condensation polymer with a benzene ring in every repeating unit
 C) An addition polymer with two carbon atoms in every repeating unit
 D) A condensation polymer with two nitrogen atoms in every repeating unit

30. Consider the two compounds:
 (A)  (B) 

Vapour pressure of B at a given temperature could be expected to be
 A) Higher than that of A
 B) Lower than that of A
 C) Same as that of A
 D) Higher or lower than that of A depending on the material in the flask

31. Which of the following is used as preservative of pickles, tomato ketchup and fruit juices?
- A) Sodium oxalate B) Acetic acid
C) Salicylic acid D) Sodium benzoate
32. Which one of the following is used in perfumes?
- A) Acetophenone B) Benzene
C) Benzoyl chloride D) Methyl salicylate
33. The differentials of ----- are inexact.
- A) w and G B) w and q
C) q and U D) w and S
34. The vitamin responsible for DNA synthesis is
- A) Ascorbic acid B) Cyanocobalamine
C) Ergocalciferol D) Pyridoxine
35. A virus particle primarily contains
- A) Nucleic acids and proteins
B) Nucleic acids and vitamins
C) Proteins and carbohydrates
D) Proteins and hormones
36. Lennard-Jones theory is related to -----.
- A) Vapourisation B) Sublimation
C) Fusion D) Decomposition
37. What is oil of mirbane?
- A) Aniline B) Nitrobenzene
C) Methylamine D) Acetophenone
38. Which of the following statement is correct with respect to carbanions?
- A) They are formed by homolytic fission
B) The carbon carrying the charge has even number of valence electrons
C) They have distorted octahedral structure
D) The hybrid of carbon in carbanions is sp^2
39. The reagent used in Dickmann condensation is
- A) Anhy. $AlCl_3$ B) C_2H_5ONa
C) $Al(OCH Me)_3$ D) KNH_2 in liquid NH_3
40. Which one is a direct dye?
- A) Alizarin B) Malachite green
C) Indigo D) Congo red

41. The decreasing order of resonance energies (stabilities) of aromatic, anti aromatic and non aromatic compounds is
 A) Aromatic > anti aromatic > non aromatic
 B) Anti aromatic > aromatic > non aromatic
 C) Non aromatic > anti aromatic > aromatic
 D) Aromatic > non aromatic > anti aromatic
42. In gas-liquid chromatography the stationary phase is a
 A) Liquid
 B) Gas
 C) Plasma
 D) Gas-liquid solution
43. Proteins play an important role in biochemistry; they usually consist of ----- different amino acids
 A) 26
 B) 15
 C) 10
 D) 8
44. The Hofmann rearrangement has an intermediate that is electronically similar to that in the
 A) Pinacol rearrangement
 B) Claisen rearrangement
 C) Cope rearrangement
 D) Beckmann rearrangement
45. Which of the following compound does not give benzoic acid on oxidation with acidified KMnO_4 ?
- A) 
- B) 
- C) 
- D) 
46. Which of the following base is found only in RNA and not in DNA
 A) Adenine
 B) Uracil
 C) Guanine
 D) Thymine
47. Which one of the following is not n-type and non-stoichiometric semiconductors?
 A) ZnO
 B) ZnS
 C) CdS
 D) FeS
48. The complex ion with maximum CFSE is:
 A) $[\text{Co}(\text{NH}_3)_6]^{3+}$
 B) $[\text{Mn}(\text{H}_2\text{O})_6]^{2+}$
 C) $[\text{Co}(\text{CNS})_4]^{2-}$
 D) $[\text{CoF}_6]^{3-}$
49. Which of the following favours high lattice energy in ionic compounds?
 A) Small ion, low charge
 B) Small ion, high charge
 C) Large ion, high charge
 D) Large ion, low charge
50. Which of the following violates the Aufbau principle?
 A) $2s^1 2p_x^2 2p_y^1 2p_z^1$
 B) $2s^2 2p_x^2 2p_y^1 2p_z^1$
 C) $2s^1 2p_x^1 2p_y^1 2p_z^1$
 D) $2s^2 2p_x^2 2p_y^2 2p_z^1$

51. The occurrence of reaction is impossible, if
 A) ΔH is + ve and $\Delta S = + ve$ B) ΔH is - ve and $\Delta S = + ve$
 C) ΔH is + ve and $\Delta S = - ve$ D) ΔH is - ve and $\Delta S = - ve$
52. Which of the following statements is not correct?
 A) Double bond is shorter than single bond
 B) Hydrogen bond is stronger than ionic bond
 C) Double bond is stronger than a single bond
 D) Covalent bond is stronger than hydrogen bond.
53. The colligative property of a solution depends on
 A) Nature of solvent B) Nature of solution
 C) No. of moles of solvent D) Number of solute particles.
54. Choose the correct statements:
 I. The boiling point of a solvent is always lower than that of the solution.
 II. The freezing point of a solvent is always higher than that of the solution.
 III. A dilute solution has more solute than solvent in it.
 IV. Molality of a solution is the number of moles of solute per lkg. of solution.
- Of the statements:
 A) I and II B) I and III
 C) II and III D) I and IV
55. The numbers of α and β particles in $(4n + 2)$ series involved are
 A) $6\alpha, 4\beta$ B) $7\alpha, 4\beta$
 C) $8\alpha, 6\beta$ D) $8\alpha, 5\beta$
56. When phosphate is treated with ammonium molybdate solution in the presence of conc. Nitric acid, one gets
 A) Yellow precipitate B) White precipitate
 C) Red precipitate D) Black precipitate
57. Which of the following is a tetra basic acid?
 A) Orthophosphoric acid B) Meta phosphoric acid
 C) Pyrophosphoric acid D) Phosphorous acid.
58. On heating, potassium permanganate gives
 A) $K_2MnO_4 + MnO + O_2$ B) $K_2MnO_4 + MnO_2 + H_2O$
 C) $K_2MnO_4 + MnO_2 + O_2$ D) $MnO_2 + MnO + O_2$
59. The reaction catalysed by superoxide dismutase is:
 A) Hydrogenation B) Disproportionation
 C) Deiodination D) Bromination

60. Which of the following ions is smaller in size than Cl^- ion?
 A) S^{2-} B) K^+ C) Br^- D) Rb^+
61. The ground term symbol of the metal ion present in hemoglobin is
 A) $^1\text{S}_0$ B) $^5\text{D}_4$ C) $^2\text{D}_{3/2}$ D) $^5\text{D}_0$
62. The order of CO stretching frequency in the series of $\text{V}(\text{CO})_6^-$, $\text{Mn}(\text{CO})_6^+$ and $\text{Cr}(\text{CO})_6$ is,
 A) $\text{V}(\text{CO})_6^- < \text{Mn}(\text{CO})_6^+ < \text{Cr}(\text{CO})_6$
 B) $\text{Cr}(\text{CO})_6 > \text{V}(\text{CO})_6^- > \text{Mn}(\text{CO})_6^+$
 C) $\text{V}(\text{CO})_6^- < \text{Cr}(\text{CO})_6 < \text{Mn}(\text{CO})_6^+$
 D) $\text{Cr}(\text{CO})_6 > \text{Mn}(\text{CO})_6^+ > \text{V}(\text{CO})_6^-$
63. Which of the following metalloproteins does not have iron in the active site?
 A) Hemoglobin B) Hemerythrin
 C) Hemocyanin D) Cytochrome
64. The metal that is involved in water oxidation of the photosynthetic process is,
 A) Cr B) Mn C) Co D) Ni
65. When an electron is removed from oxygen molecule to form O_2^+ ,
 A) The bond length and bond order both increase
 B) The bond length and bond order both decrease
 C) The bond length decreases and bond order increases
 D) The bond length increases and bond order decreases
66. If $^6\text{Li}_3$ and $^2\text{H}_1$ are transmuted, the products are
 A) $^7\text{Li}_3 + ^1\text{H}_1$ B) $^7\text{Li}_3 + ^1\text{n}_0$
 C) $^7\text{Li}_3 + ^4\text{He}_2$ D) $^6\text{Li}_3 + ^1\text{H}_1$
67. In the trigonalbipyramidal crystal field, the d orbital with the highest energy is
 A) d_{xy} B) $d_{x^2-y^2}$ C) d_{yz} D) d_{z^2}
68. The metal present at the active site of the protein carboxypeptidase A is
 A) Zinc B) Molybdenum C) Magnesium D) Cobalt
69. For the aqueous solution-air interface ----- is a capillary active solute.
 A) Sodium chloride B) Sugar
 C) Diethyl ether D) Glycerine
70. Which of the following molecules will have a permanent dipole moment?
 A) SiF_4 B) XeF_4 C) SF_4 D) BF_3
71. Which of the following is not a primary pollutant?
 A) Sulphurdioxide B) Carbondioxide
 C) Carbon monoxide D) Nitrogen oxides.

72. Bis (dimethylglyoximato) nickel (II) is
 A) Paramagnetic and square planar
 B) Diamagnetic and tetrahedral
 C) Paramagnetic and tetrahedral
 D) Diamagnetic and square planar.
73. According to Fajan, polarization is generally high with
 A) Small cation and small anion
 B) Small cation and large anion
 C) Large cation and large anion
 D) Large cation and small anion
74. The strongest oxidizing and reducing agents are respectively
 A) F_2O , N_3^-
 B) $KMnO_4$, $FeSO_4$
 C) $K_2Cr_2O_7$, Cu_2Cl_2
 D) $KMnO_4$, $H_2C_2O_4$
75. Which among the following molecules belong to point group C_{4v} ?
 A) $[PtCl_4]^{2-}$
 B) $XeOF_4$
 C) XeF_4
 D) $[BF_4]^-Na^+$
76. The most abundant elements in the universe are
 A) O, N
 B) H, O
 C) H, He
 D) C, H
77. A chemical that can be used simultaneously as coagulant and softening agent is
 A) Soda
 B) Sodalime
 C) Alum
 D) Lime
78. Systematic error-----
 A) Is always positive
 B) Cannot be corrected
 C) Can be corrected
 D) Is always negative
79. Which of the following has ionic M-L bonding?
 A) Ferrocene
 B) Dibenzene chromium
 C) Manganocene
 D) Zeise's salt
80. The actual catalyst in hydroformylation reaction is
 A) $HCo(CO)_4$
 B) $Co_2(CO)_8$
 C) CO
 D) $CO + H_2$
81. Isotactic polypropylene can be synthesized by -----.
 A) Ring opening polymerisation
 B) Coordination polymerisation
 C) Step growth polymerisation
 D) Copolymerization
82. Which of the following ore does not contain magnesium?
 A) Dolomite
 B) Carnallite
 C) Gypsum
 D) Epsom

83. ^{14}C - isotope is used in which of the following research studies?
 A) Treatment of cancer
 B) Determination of age of earth
 C) Dating of wood and animal fossils
 D) Fertilizer absorption of plants.
84. Which substance shows ferromagnetism?
 A) CrO_2 B) ZrO_2 C) CdO D) MnO
85. ----- has an inverse spinel structure.
 A) FeO B) $\alpha\text{-Fe}_2\text{O}_3$ C) $\gamma\text{-Fe}_2\text{O}_3$ D) Fe_3O_4
86. The orthorhombic crystal system is represented by
 A) $a=b=c$; $\alpha=\beta=\gamma=90^\circ$ B) $a\neq b\neq c$; $\alpha=\beta=\gamma=90^\circ$
 C) $a\neq b\neq c$; $\alpha=\gamma=90^\circ$; $\beta\neq 90^\circ$ D) $a\neq b=c$; $\alpha=\beta=\gamma=120^\circ$
87. The reaction of ammonium chloride with BCl_3 at 140°C followed by treatment with NaBH_4 gives product X. The product X is:
 A) $\text{B}_3\text{N}_3\text{H}_3$ B) $\text{B}_3\text{N}_3\text{H}_6$
 C) $\text{B}_3\text{N}_3\text{H}_{12}$ D) $\text{B}_3\text{N}_4\text{H}_3$
88. MnO has rocksalt (NaCl) structure with a unit cell parameter $a = 4.43 \text{ \AA}$. The Mn-O distance in MnO is,
 A) $(4.43/2) \text{ \AA}$ B) $(2^{1/2} \times 4.43) \text{ \AA}$
 C) $(4.43/2^{1/2}) \text{ \AA}$ D) $(4.43/3^{1/2}) \text{ \AA}$
89. The most stable organometallic compound among the following four is,
 A) $[\text{Cr}(\eta^5\text{-C}_5\text{H}_5)_2]$ B) $[\text{Cr}(\eta^6\text{-C}_6\text{H}_6)_2]$
 C) $[\text{Ru}(\eta^6\text{-C}_6\text{H}_6)_2]$ D) $[\text{Co}(\eta^5\text{-C}_5\text{H}_5)_2]$
90. Which of the following statement is not correct?
 A) A combination of Gold with colloidal stannic acid is called 'purple of Cassius'
 B) A mixture of $\text{Ca}(\text{OH})_2$ and CuSO_4 is known as Bordeaux mixture
 C) Copper glance can be concentrated by froth floatation method
 D) The matte is a mixture of Cu_2S and FeO
91. Natural rubber is a polymer of ----
 A) Neoprene B) Isoprene
 C) Chloroprene D) Butadiene
92. The hybridization of atomic orbitals of nitrogen in NO_2^+ , NO_3^- and NH_4^+ are ---- respectively
 A) sp_2 , sp^3 and sp^2 B) sp , sp^2 and sp^3
 C) sp^2 , sp and sp^3 D) sp^2 , sp^3 and sp

111. BaTiO₃ is a -----electric material.
 A) Ferri B) Ferro C) Piezo D) Pyro
112. Which one among the compounds given below exhibits an absorption band at $\nu_{\max} 1780 \text{ cm}^{-1}$ in the IR spectrum?
 A) Acetonitrile B) Cyclobutanone
 C) Acetophenone D) Cyclobutanol
113. The instrument used for measuring heat content is
 A) Spectrometer B) Polarimeter
 C) Calorimeter D) Thermometer
114. In a galvanic cell, salt bridge is used to
 A) Complete the circuit
 B) Reduce electric resistance in the cell
 C) Separate anode from cathode
 D) Carry salts for chemical reaction to occur
115. The more rapidly a wave function changes from place to place, the kinetic energy of the particle it describe is
 A) Zero B) Lower
 C) Higher D) Constant
116. The function $\cos ax$ is an eign function of the operator
 A) d/dx B) Multiplication
 C) Logarithm D) d^2/dx^2
117. ----- has the property of one dimensional metallic conductivity.
 A) Tetrasulfurtetranitride B) Polythiazyl
 C) Disulfurdinitride D) Trisulfurtrinitride
118. According to Wien displacement law
 A) $M = \sigma T^4$ B) $U = \alpha T^4$
 C) $T\lambda_{\max} = \text{constant}$ D) $\lambda_{\max}/T = \text{constant}$
119. The restoring force and potential energy of a harmonic oscillator are respectively
 A) kx and kx^2 B) $-kx$ and $1/2 kx^2$
 C) $-kx^2$ and $2kx$ D) kx^2 and kx
120. Glassy carbon electrode is used in cyclic voltammetric technique as
 A) Reference electrode B) Working electrode
 C) Counter electrode D) None of these
