BOOKLET CODE [A]

Invigilator's Signature

ENTRANCE EXAMINATION – 2017
M. Sc. Chemistry

TIME: 2 HOURS **MAXIMUM MARKS: 100**

HALL TICKET NUMBER: [ ]

INSTRUCTIONS

1. Write your **HALL TICKET NUMBER** and the **BOOKLET CODE** in the space provided above and also on the **OMR** ANSWER SHEET given to you.
2. Make sure that pages numbered from **1 - 18** are present (excluding pages assigned for rough work).
3. There are 100 questions in this paper. All questions carry equal marks.
4. **There is negative marking. Each wrong answer carries – 0.33 mark.**
5. Answers are to be marked on the OMR answer sheet following the instructions provided on it.
6. Hand over the OMR answer sheet at the end of the examination.
7. In case of a tie, the marks obtained in the first 25 questions (**PART A**) will be used to determine the order of merit.
8. No additional sheets will be provided. Rough work can be done in the space provided at the end of the booklet.
9. Calculators are allowed. Cell phones are not allowed.
10. Useful constants are provided at the beginning, before PART A in the question paper.
11. Candidate should write and darken the correct Booklet Code in the OMR Answer Sheet, without which the OMR will not be evaluated. The candidates defaulting in marking the Booklet Code in the OMR shall not have any claim on their examination and University shall not be held responsible.

N-10

Useful Constants:

Rydberg constant = 109737 cm^{-1}; Faraday constant = 96500 C; Planck constant = 6.625×10^{-34} J s; Speed of light = 2.998×10^{8} m s^{-1}; Boltzmann constant = 1.380×10^{-23} J K^{-1}; Gas constant = 8.314 J K^{-1} mol^{-1} = 0.082 L atm K^{-1} mol^{-1} = 1.987 cal K^{-1} mol^{-1}; Mass of electron = 9.109×10^{-31} kg; Mass of proton = 1.672×10^{-27} kg; Charge of electron = 1.6×10^{-19} C; 1 D = 3.336×10^{-30} C m; 1 bar = 10^{5} N m^{-2}; RT/F (at 298.15 K) = 0.0257 V.

PART – A

1. Mg_2SiO_4 belongs to the class of

   [A] pyrosilicates. [B] chain silicates.
   [C] sheet silicates. [D] orthosilicates.

2. The electronegativity of carbon is highest in

   [A] *sp* hybridized carbon. [B] sp^2 hybridized carbon.
   [C] sp^3 hybridized carbon. [D] the ground state of carbon.

3. The maximum number of cyclic structures possible for the molecular formula C_3H_6O is:

   [A] 1 [B] 2
   [C] 3 [D] 4

4. The correct order of basicity of the group 15 (group 5A) trihydrides is:

   [A] $NH_3 > PH_3 > AsH_3$ [B] $NH_3 < PH_3 < AsH_3$
   [C] $NH_3 = PH_3 > AsH_3$ [D] $NH_3 > PH_3 = AsH_3$

5. The first noble gas compound reported is:

   [A] XeO_3 [B] KrF_2
   [C] XeF_6 [D] $Xe^{+}(PtF)_6^{-}$

6. $\left(\frac{\partial U}{\partial V}\right)_T$ for an ideal gas is:

   [A] positive [B] negative
   [C] zero [D] infinite

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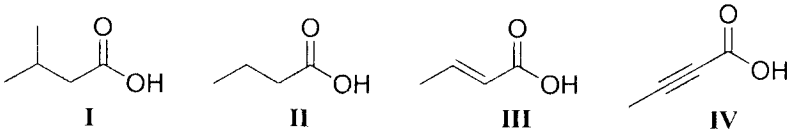
7. The decreasing order of acidity of the following compounds is:



I II III IV

[A] **I > II > III > IV** [B] **II > I > IV > III**

[C] **IV > III > I > II** [D] **IV > III > II > I**

8. A 20.0 mL sample of 0.30 M HCl is titrated with 0.15 M NaOH. What is the pH of the solution after 40.3 mL of NaOH is added to the acid?

[A] 2.95 [B] 3.13

[C] 11.05 [D] 10.87

9. The most appropriate reagent for the conversion of hexanoic acid to hexan-1-ol is:

[A] $NaBH_4$ [B] $LiBH_4$

[C] CaH_2 [D] $BH_3 \cdot THF$

10. The shape of NO_3^- is

[A] trigonal planar. [B] tetrahedral.

[C] T-shaped. [D] trigonal pyramidal.

11. The most appropriate reagent to carry out the following transformation is:

$$RCH_2OH \longrightarrow RCHO$$

[A] $KMnO_4$ [B] CrO_3

[C] OsO_4 [D] Pyridinium chlorochromate

12. The species having the shortest bond length among the following is:

[A] NO [B] NO^+

[C] NO^{2+} [D] NO^-

13. The degree of dissociation of an aqueous solution of a weak acid (pK_a=4.74) at pH=4.74 is:

[A] 0.34 [B] 0.25

[C] 0.50 [D] 0.90

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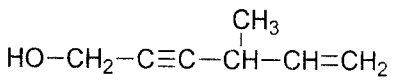
14. Which of the following elements are present in DNA?
(i) Carbon (ii) Nitrogen (iii) Oxygen (iv) Phosphorus

[A] i, ii, and iii
[B] i, ii, and iv
[C] ii, iii, and iv
[D] i, ii, iii, and iv

15. Unit of van der Waals gas constant a is:

[A] atm L
[B] atm L^2mol^{-2}
[C] L mol^{-1}
[D] L^2mol^{-2}

16. The IUPAC name of the following compound is:



[A] 4-Methylhex-5-en-2-yn-1-ol
[B] 3-Methylhex-4-yn-6-ol
[C] 1-Hydroxy-4-methylhex-5-en-2-yne
[D] 6-Hydroxy- 3-methylhex-4-yn-1-ene

17. The osmotic pressure of a 3.42% (W/V) solution of sucrose (Molecular weight = 342) and a solution of 1.73 g of a molecule, A, in 100 mL of water are same at the same temperature. The molecular weight of A is:

[A] 123
[B] 273
[C] 676
[D] 173

18. The quantum numbers $n, l,$ and m of the highest occupied atomic orbital of Be are:

[A] $(1,0,0)$
[B] $(2,0,0)$
[C] $(2,1,0)$
[D] $(2,1,1)$

19. 100 g of C_6H_6 is mixed with 100 g of $C_6H_5CH_3$ at 20 °C and 1 atm. Assuming ideal behavior, the entropy of mixing (in cal K^{-1}) is:

[A] 3.24
[B] 5.24
[C] 7.24
[D] 4.24

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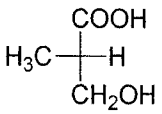
20. The gas which effuses 2.3 times faster than N_2O_4 at the same temperature is:

[A] NH_3 [B] CN_2
[C] O_3 [D] N_2O

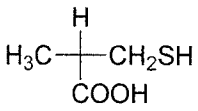
21. The most electrophilic molecule among the following is:

[A] H_2O [B] $H_2C{=}CH_2$
[C] BF_3 [D] NH_3

22. The absolute configurations of the following compounds are:



P



Q

[A] '*R*' in **P** and '*S*' in **Q** [B] '*R*' in both **P** and **Q**
[C] '*S*' in **P** and '*R*' in **Q** [D] '*S*' in both **P** and **Q**

23. If the ratio of the area of a square to that of a circle is equal to π, the ratio of perimeter of the square to the circumference of the circle is equal to:

[A] 1 [B] 2
[C] 3 [D] 4

24. If the carbon-carbon bond length in benzene (C_6H_6) is 1.40 Å, the distance between the carbons at 1 and 3 position is:

[A] 2.000 Å [B] 2.135 Å
[C] 2.425 Å [D] 2.800 Å

25. Tommy has to cross two rivers to meet Janny. The first river has 10 bridges and the second one has 20 bridges. How many possible paths can Tommy follow to meet Janny?

[A] 200 [B] 2
[C] 201 [D] 199

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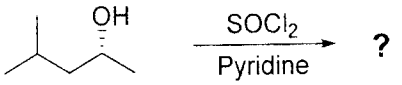
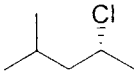
PART – B

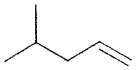
26. Choose the planar species from the following: (i) XeF_4, (ii) ClO_4^-, (iii) $PdCl_4^{2-}$, (iv) MnO_4^-

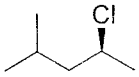
[A] (i) and (ii)
[B] (i) and (iv)
[C] (iii) only
[D] (i) and (iii)

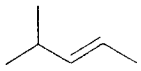
27. The major product formed in the following reaction is



[A] 

[B] 

[C] 

[D] 

28. One mole of a compound with molecular formula C_9H_{16} upon ozonolysis gives one mole each of acetone, formaldehyde and levulinaldehyde (a ketoaldehyde). The compound is:

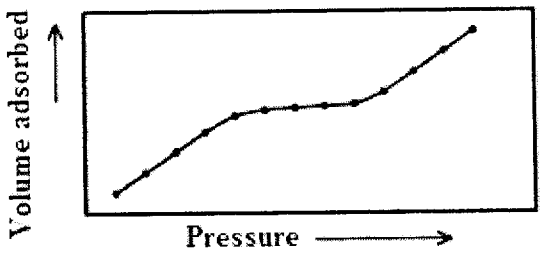
[A] 2,6-dimethylhepta-2,5-diene
[B] 2,6-dimethylhepta-1,6-diene
[C] 2,6-dimethylhepta-1,5-diene
[D] (*E*)-2,6-dimethylhepta-2,4-diene

29. Choose the species with the maximum number of unpaired electrons from the following:

(i) $[MnCl_4]^{2-}$ (ii) $[NiCl_4]^{2-}$ (iii) $[FeCl_4]^-$ and (iv) $[CoCl_4]^{2-}$

[A] (iv) only
[B] (i) and (iii)
[C] (i) and (ii)
[D] (i) only

30. The adsorption isotherm of N_2 on Nickel is shown in the figure below;



The behavior is best described by:

[A] Henry's Isotherm
[B] Langmuir Isotherm
[C] BET Isotherm
[D] Gibbs Isotherm

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31. Ferrocene is an organometallic compound consisting of

[A] one Fe^{3+} and two η^5 cyclopentadienyl anions.
[B] one Fe^{2+} and two η^5 cyclopentadienyl anions.
[C] one Fe^{3+} and two η^1 cyclopentadienyl anions.
[D] one Fe^{2+} and two η^1 cyclopentadienyl anions.

32. The number of moles of orthophosphoric acid generated by the complete reaction of solid phosphorus pentoxide with one mole of water is:

[A] $\frac{3}{2}$ [B] $\frac{1}{3}$
[C] $\frac{1}{6}$ [D] $\frac{2}{3}$

33. The equilibrium constant of a gas phase reaction is 2.0 at 400 K and 3.0 at 500 K. The standard enthalpy (ΔH°) of this reaction is close to

[A] $+0.805$ kcal mol^{-1} [B] $+1.61$ kcal mol^{-1}
[C] -0.805 kcal mol^{-1} [D] -1.61 kcal mol^{-1}

34. If Δ_o and Δ_t represent the octahedral and tetrahedral crystal field splittings respectively, the ratio $\frac{\Delta_o}{\Delta_t}$ is close to:

[A] 1.00 [B] 0.50
[C] 2.2 [D] 0.44

35. The VSEPR geometry will be identical with the molecular geometry for:

[A] $AlCl_3$ [B] SF_4
[C] ICl_3 [D] XeF_4

36. Which of the following metal ions can give both high and low spin octahedral complexes?

[A] Cr^{3+} [B] Fe^{2+}
[C] Cu^{2+} [D] Ti^{3+}

37. Which of the following compounds possesses inversion symmetry?

[A] SiF_4 [B] PF_5
[C] $[CoF_6]^{3-}$ [D] BCl_3

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38. The spin-only magnetic moment (in B.M.) of a high-spin complex of Fe^{3+} is:

[A] 1.73 [B] 5.92
[C] 2.83 [D] 4.90

39. $\int e^x(1 + x)\, dx =$

[A] e^x [B] $e^x(1 + x)$
[C] $(1 + x)$ [D] xe^x

40. If i, j and k are unit vectors along the Cartesian axes x, y and z directions respectively, length of the projection of the vector $3i - 4j + 2k$ on the xy plane is:

[A] 1 [B] 3
[C] 5 [D] 7

41. The amount of $BaCl_2 \cdot 2H_2O$ (Molecular weight = 244.3 g mol^{-1}) required to prepare 500 mL of 0.0740 M chloride ion (Cl^-) solution in water is:

[A] 4.52 g [B] 9.04 g
[C] 7.71 g [D] 8.35 g

42. The total number of valence electrons in each metal atom in the dichloro bridged complex $(CO)_2Rh(\mu\text{-}Cl_2)Rh(CO)_2$ is:

[A] 14 [B] 16
[C] 17 [D] 18

43. A constant current of 0.800 A is used to deposit copper at the cathode. The number of grams of copper deposited in 15.2 min, considering the half-reaction; $Cu^{2+} + 2e^- \rightarrow Cu$ (s), is (Atomic weight of Cu = 63.5 g mol^{-1}):

[A] 0.772 g [B] 0.240 g
[C] 0.480 g [D] 12.16 g

44. Which of the following is a correct description of the gas phase structure of XeF_6?

[A] Perfect octahedral
[B] Distorted octahedral
[C] Trigonal prismatic
[D] Polymeric with Xe octahedral

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45. How many geometric isomers are possible for the complex [Co(dien)ABC], where dien = $NH_2CH_2CH_2NHCH_2CH_2NH_2$, a tridentate ligand and A, B and C are monodentate ligands?

[A] 6 [B] 4

[C] 5 [D] 2

46. When dilute HCl is added to a white salt, effervescence is observed along with a colorless and odourless gas. Then a white precipitatae is also formed which dissolves on heating. The salt is:

[A] Na_2SO_4 [B] $ZnCO_3$

[C] $PbCO_3$ [D] $HgNO_3$

47. The borane $[B_8H_8]^{8-}$ can be classified as:

[A] Arachno borane [B] Closo borane

[C] Hypho borane [D] Nido borane

48. Addition of concentrated H_2SO_4 to a solution of $KMnO_4$ leads to the formation of an explosive oil with formula:

[A] Mn_2O_7 [B] Mn_3O_4

[C] MnO_2 [D] K_2MnO_4

49. The activation energy of a certain reaction is 87 kJ mol^{-1}. The ratio of the rate constants of this reaction at 37 °C to the reaction at 15 °C is:

[A] $\frac{5}{1}$ [B] $\frac{8.3}{1}$

[C] $\frac{13}{1}$ [D] $\frac{24}{1}$

50. Both $[Ni(CN)_4]^{2-}$ and $[Zn(CN)_4]^{2-}$ are diamagnetic. The hybridization of valence orbitals of Ni^{2+} and Zn^{2+} in these complexes will be

[A] sp^3 for both. [B] sp^3 and dsp^2, respectively.

[C] dsp^2 for both. [D] dsp^2 and sp^3, respectively.

51. Which of the following processes results in the formation of neutrino?

[A] α-ray emission [B] β-ray emission

[C] γ-ray emission [D] X-ray emission

52. The standard potential of the cell, $Zn|Zn^{2+}||Fe^{3+}|Fe^{2+}$ ($E^0_{Zn^{2+}/Zn} = -0.76$ V and $E^0_{Fe^{3+}/Fe^{2+}} = +0.77$ V) is:

[A] +0.77 V
[B] −1.53 V
[C] +2.30 V
[D] +1.53 V

53. Argon gas (assumed to be ideal) is expanded reversibly and adiabatically from a volume of 50 L to 200 L. If the initial temperature is 300 K then the final temperature would be:

[A] 75 K
[B] 37.5 K
[C] 119 K
[D] 200 K

54. If the average speed of hydrogen molecule at a given temperature is *c*, then the average speed of oxygen molecule at the same temperature will be

[A] 2c
[B] 4c
[C] $\frac{c}{2}$
[D] $\frac{c}{4}$

55. The molar conductance of a saturated AgCl solution is 130 S $cm^2 mol^{-1}$ and the solubility product of AgCl is 1.6×10^{-10} $mol^2 L^{-2}$. Resistance of this solution placed in a conductivity cell with cell constant 0.75 cm^{-1} is:

[A] $4.6 \times 10^{10}\ \Omega$
[B] $4.6 \times 10^{5}\ \Omega$
[C] $9.2 \times 10^{5}\ \Omega$
[D] $9.2 \times 10^{10}\ \Omega$

56. $\tan\left(\frac{\theta}{2}\right) =$

[A] $\frac{\sin\theta}{(1+\cos\theta)}$
[B] $\frac{(1+\cos\theta)}{\sin\theta}$
[C] $\frac{\cos\theta}{(1+\sin\theta)}$
[D] $\frac{(1+\sin\theta)}{\cos\theta}$

57. A reaction follows the general rate law, $rate = k[A][B]^2[C]$. If the concentration of B is decreased by a factor of 3, and the concentration of C is decreased by a factor of 2, the rate of the reaction will decrease by a factor of

[A] 6
[B] 12
[C] 18
[D] $\frac{1}{6}$

58. The mobilities of A^+ and B^- are 6.6×10^{-4} and 5.7×10^{-4} $cm^2V^{-1}s^{-1}$ respectively at 25°C. The ratio of their transport number is:

[A] 1.16 [B] 2.15

[C] 3.15 [D] 4.15

59. When an X-ray beam collides with an electron, a part of the photon energy is transferred to the electron and the light is scattered. This effect is known as:

[A] Raman effect [B] Zeeman effect

[C] Compton effect [D] Stark effect

60. The total number of rotational and vibrational degrees of freedom for $H_2C = CH - CH_3$ are respectively:

[A] 0 and 21 [B] 1 and 21

[C] 3 and 21 [D] 2 and 22

61. The equation connecting molar heat capacity at constant pressure to molar heat capacity at constant volume for an ideal gas is:

[A] $C_p = \frac{C_v}{R}$ [B] $C_p = \frac{R}{C_v}$

[C] $C_p = R \times C_v$ [D] $C_p = R + C_v$

62. The atomic weight of antimony is 121.757 amu. It has only two naturally occurring isotopes. Abundance of the isotope with mass 120.904 amu is 57.3%. The mass of the other isotope is:

[A] 122.610 [B] 122.902

[C] 122.393 [D] 122.757

63. The (100) X-ray diffraction peak of a cubic crystal occurs at $\theta = 19.50°$. The (111) diffraction peak will be observed at:

[A] 9.75° [B] 19.50°

[C] 33.77° [D] 35.32°

64. The maximum number of hydrogen bonds a water molecule can have is:

[A] 1 [B] 2

[C] 3 [D] 4

65. For a certain phase transition, there is no change in the volume, but the specific heat has a discontinuity. From this it may be concluded that the phase transition is a

[A] First-order transition
[B] Second-order transition
[C] λ-transition
[D] Quantum phase transition

66. On which organelle does the protein synthesis takes place?

[A] ribosome
[B] mitochondria
[C] Golgi body
[D] lysosome

67. $\lim_{x\to 0} \frac{\partial^2}{\partial x^2}\left(\sqrt{(4-x^2)}\right) =$

[A] 0.50
[B] 0.25
[C] 0.00
[D] 2.00

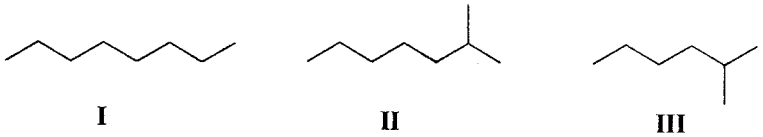
68. $\int_0^l \sin\left(\frac{\pi x}{l}\right) \cos\left(\frac{\pi x}{l}\right) dx =$

[A] 0.00
[B] l
[C] 1.00
[D] ∞

69. Nickel (Atomic weight = 58.71 g mol^{-1}) crystallizes in FCC lattice with a unit cell length of 3.52 Å. The density (in g cm^{-3}) of nickel is:

[A] 3.24
[B] 5.64
[C] 8.94
[D] 18.2

70. The increasing order of heat of combustion of the following compounds is:



I II III

[A] **I < II < III**
[B] **II < III < I**
[C] **II < I < III**
[D] **III < II < I**

71. The complex number $\left(-2 - i\,2\sqrt{3}\right)$ in polar form is given by:

[A] $4e^{i\pi/3}$
[B] $4e^{i2\pi/3}$
[C] $4e^{i4\pi/3}$
[D] $4e^{i5\pi/3}$

72. $\frac{d}{dx}[\ln(x^2 + 2x + 1)]$ at $x = 0$ is:

[A] 0 [B] 1
[C] 2 [D] 3

73. Given the series $1, 1, 2, 3, 5, 8, 13, 21, X, \cdots$, the value of X is:

[A] 34 [B] 29
[C] 27 [D] 25

74. If α and β are the remaining two angles of a right angle triangle, $\sin(2\beta)$ is equal to:

[A] $\cos(2\alpha)$ [B] $\sin(2\alpha)$
[C] $1 + \tan^2\alpha$ [D] $\sec^2\alpha$

75. The two curves $X^2 + Y^2 = 4$ and $X^2 - Y^2 = 2$ intersect each other at

[A] no point. [B] one point.
[C] two points. [D] four points.

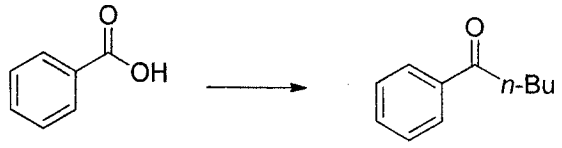
76. Sum of the infinite series, $1 + \frac{x^2}{2!} + \frac{x^4}{4!} + \frac{x^6}{6!} + \frac{x^8}{8!} + \cdots$ is

[A] $\sin(x)$ [B] $\cos(x)$
[C] $\cosh(x)$ [D] $\sinh(x)$

77. $\lim_{x\to 1} \frac{x^2-3x+2}{e^x-1} =$

[A] e [B] $-e$
[C] $\frac{1}{e}$ [D] $-\frac{1}{e}$

78. The following conversion is best achieved with:



[A] n-Bu_2CuLi (2 equivalents) [B] n-Bu_2CuLi (1 equivalent)
[C] n-BuLi (2 equivalents) [D] n-BuLi (1 equivalent)

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79. If the vectors $Xi + j - 2k$, $2i + k$ and $3i - 2j + k$ are coplanar (i, j and k are the unit vectors), then X =

[A] -9 [B] 9

[C] $-\frac{9}{2}$ [D] $\frac{9}{2}$

80. The compound that does NOT give a tertiary alcohol upon reaction with an excess of ethyl magnesium bromide is:

[A] 3,3-dimethylhexan-2-one
[B] hexan-2-one
[C] ethyl benzoate
[D] ethyl formate

81. The value of $A = \begin{vmatrix} 1 & 0 & 0 \\ 2 & \cos x & \sin x \\ 3 & \sin x & \cos x \end{vmatrix}$ is:

[A] 1 [B] 0

[C] cos2x [D] sin2x

82. A ball which is thrown vertically upwards, satisfies the height (m) *vs* time (s) equation, $h = 3 + 14t - 5t^2$. The maximum height it would reach is:

[A] 12.8 m in 1.4 s [B] 11.8 m in 1.4 s

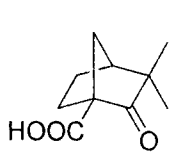
[C] 12.8 m in 1.5 s [D] 11.8 m in 1.5 s

83. The key reagent in Woodward cis dihydroxylation is:

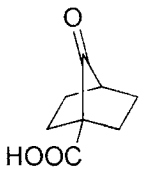
[A] OsO_4 [B] $KMnO_4$

[C] $CH_3COOAg/I_2/H_2O$ [D] C_6H_5COOAg/I_2/benzene

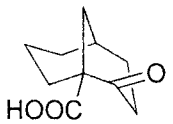
84. Identify the compound(s) that can easily undergo decarboxylation from the following:



I



II



III

[A] **II** [B] **I** and **II**

[C] **I, II** and **III** [D] **III**

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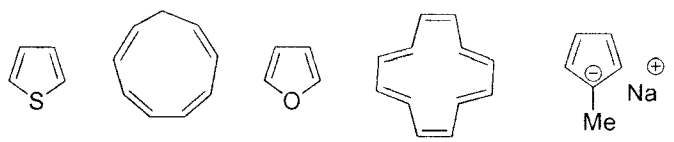
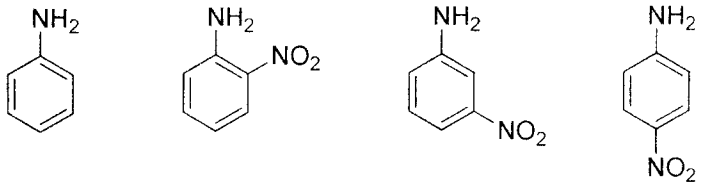
85. The aromatic compounds among the following are:



K L M N O

[A] **K**, **L** and **M**
[B] **K**, **M** and **O**
[C] **K**, **M** and **N**
[D] **K**, **M**, **N** and **O**

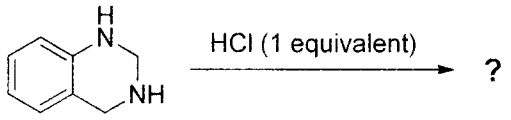
86. The decreasing order of basicity of the following compounds is:

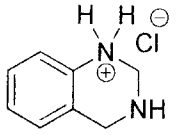


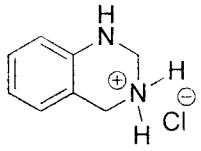
I II III IV

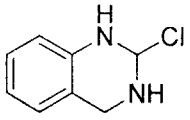
[A] **I** > **IV** > **III** > **II**
[B] **I** > **III** > **IV** > **II**
[C] **II** > **IV** > **III** > **I**
[D] **I** > **II** > **III** > **IV**

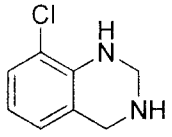
87. The major product formed in the following reaction is:



[A] 

[B] 

[C] 

[D] 

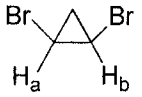
88. If $A = \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$ then $A + A^{-1} =$

[A] $\begin{bmatrix} 2 & 0 \\ 0 & 0 \end{bmatrix}$
[B] $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$
[C] $\begin{bmatrix} 2 & 0 \\ 0 & -2 \end{bmatrix}$
[D] $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$

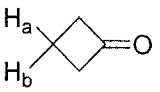
89. On which of the following compounds, is the blood group typing in humans based?

[A] carbohydrates
[B] DNA
[C] proteins
[D] lipids

90. Identify the topicity of the hydrogens marked H_a and H_b in the following compounds



I



II

[A] **I** – diastereotopic
II – enantiotopic

[B] **I** – homotopic
II – enantiotopic

[C] **I** – enantiotopic
II – homotopic

[D] **I** – homotopic
II – homotopic

91. The Hell-Volhard-Zelinsky reaction is:

[A] conversion of a α-haloester in to a α-hydroxyester
[B] α-halogenation of a carboxylic acid
[C] decarboxylation of a β-keto acid
[D] generation of a carbon-carbon double bond

92. The compound that does NOT form iodoform is:

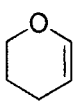
[A] acetaldehyde
[B] 3-pentanone
[C] 2-butanone
[D] isopropyl alcohol

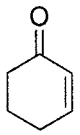
93. The decreasing order of dipole moment of the following compounds is:

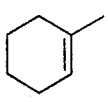
CF_2Cl_2 (**I**) CF_2H_2 (**II**) CCl_2H_2 (**III**)

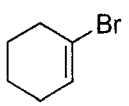
[A] **II > I > III**
[B] **II > III > I**
[C] **I > II > III**
[D] **I > III > II**

94. The electron rich olefin among the following is:

[A] 

[B] 

[C] 

[D] 

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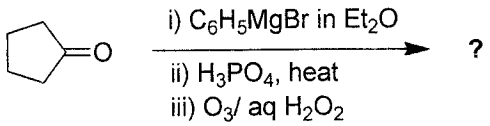
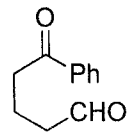
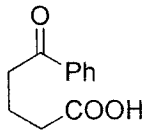
95. Which of the following hormones contains iodine?

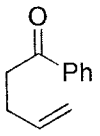
[A] thyroxine
[B] adrenalin
[C] testosterone
[D] insulin

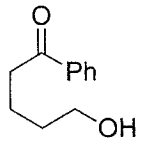
96. The product formed in the following reaction is:



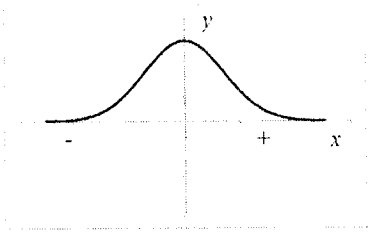
[A] 

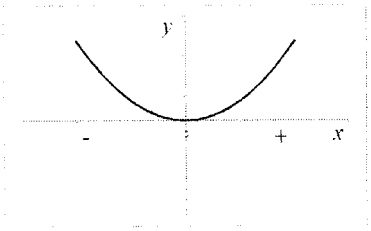
[B] 

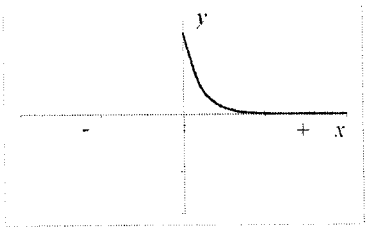
[C] 

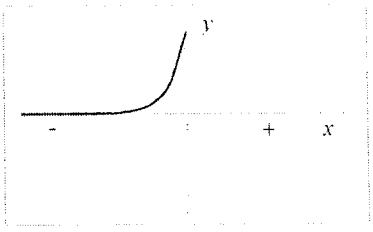
[D] 

97. The graph of $y = e^{-x^2}$ is

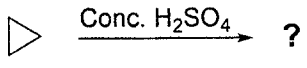
[A] 

[B] 

[C] 

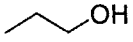
[D] 

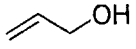
98. The major product formed in the following reaction is:



[A] 

[B] 

[C] 

[D] 

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99. Identify the reaction involving olefination of ketones from the following:

[A] Friedel-Crafts reaction
[B] Wittig reaction
[C] Cannizzaro reaction
[D] Schmidt reaction

100. The organelle in the cell, other than the nucleus, that contains DNA is:

[A] Golgi apparatus
[B] lysosomes
[C] mitochondria
[D] peroxisomes

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