AIPMT

PREVIOUS YEAR
Solved Question Papers 1
2006

Physics, Chemistry & Biology

AIPMT

PAPER 1

2006

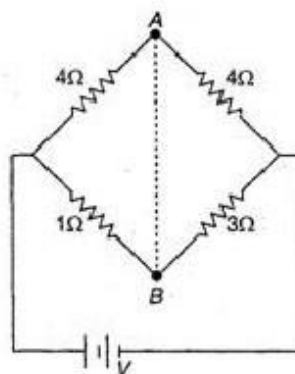## Physics

1. In producing chlorine through electrolysis 100 W power at 125 V is being consumed. How much chlorine per min is liberated ? ECE of chlorine is 0.367 x 10-6 kg/C :

   1) 17.6 mg

   2) 34.3 mg

   3) 24.3 mg

   4) 39.6 mg

2. In the circuit shown, if a conducting wire is connected between points A and B, the current in this wire will :

   1) flow from A to B

   2) flow in the direction which will be decided by the value of V

   3) be zero

   4) flow from B to A

3. A rectangular block of mass m and area of cross-section A floats in a liquid of density ρ. If it is given a small vertical displacement from equilibrium it undergoes oscillation with a time period T. Then :

   1) $T \propto \sqrt{\rho}$

   2) $T \propto (1/\sqrt{A})$

   3) $T \propto (1/\rho)$

   4) $T \propto (1/\sqrt{m})$

4. A Carnot engine whose sink is at 300 K has an efficiency of 40%. By how much should the temperature of source be increased so as to increase its efficiency by 50% of original efficiency ?

   1) 275 K

   2) 175 K

3) 250 K

4) 225 K

5. When a charged particle moving with velocity is subjected to a magnetic field of induction $\vec{B}$, the force on it is non-zero. This implies that :

1) angle between $\vec{v}$ and $\vec{B}$ is necessarily 90°

2) angle between $\vec{v}$ and $\vec{B}$ can have any value other than 90°

3) angle between $\vec{v}$ and $\vec{B}$ can have any value other than zero and 180°

4) angle between $\vec{v}$ and $\vec{B}$ is either zero or 180°

6. Two cells, having the same emf, are connected in series through an external resistance R. Cells have internal resistances r_1 and r_2 ($r_1 > r_2$) respectively. When the circuit is closed, the potential difference across the first cell is zero, The value of R is :

1) $r_1 - r_2$

2) $(r_1 + r_2)/2$

3) $(r_1 - r_2)/2$

4) $r_1 + r_2$

7. A black body at 1227°C emits radiations with maximum intensity at a wavelength of 5000 Å. If the temperature of the body is increased by 1000°C, the maximum intensity will be observed at :

1) 7500 Å

2) 1500 Å

3) 6000 Å

4) 3000 Å

8. Two circular coils 1 and 2 are made from the same wire but the radius of the 1st coil is twice that of the 2nd coil. What is the ratio of potential difference applied across them so that the magnetic field at their centres is the same ?

1) 5   2) 4   3) 7   4) 2

9. A transistor-oscillator using a resonant circuit with an inductor L (of negligible resistance) and a capacitor C in series produce oscillations of frequency f. If L is doubled and C is changed to 4C, the frequency will be :

1) f/4

2) 8f

3) f/2√2

4) 2f

10. The binding energy of deuteron is 2.2 MeV and that of $_{42}$He is 28 MeV. If two deuterons are fused to form one $_{42}$He then the energy released is :

1) 21.6 MeV

2) 23.6 MeV

3) 17.2 MeV

4) 28.2 MeV

11. In a radioactive material the activity at time t_1 is R_1 and at a later time t_2, it is R_2. If the dacay constant of the material is λ, then :

1) $R_1 = R_2\, e^{-\lambda(t_1 - t_2)}$

2) $R_1 = R_2\, e^{\lambda(t_1 - t_2)}$

3) $R_1 = R_2\, e^{(t_2 / t_1)}$

4) $R_1 = R_2$

12. Ionization potential of hydrogen atom is 13.6 eV. Hydrogen atoms in the ground state are excited by monochromatic radiation of photon energy 12.1 eV. According to Bohr's theory, the spectral lines emitted by hydrogen will be :

1) two   2) three   3) four   4) one

13. The potential energy of a long spring when stretched by 2 cm is U. If the spring is stretched by 8 cm the potential energy stored in it is :

1) 4U   2) U/8   3) 16U   4) U/4

14. For angles of projection of a projectile at angles $(45° \theta)$ and $(45° + \theta)$, the horizontal ranges described by the projectile are in the ratio of :

1) 1 : 1

2) 2 : 3

3) 1 : 2

4) 3 : 2

15. A body of mass 3 kg is under a constant force which causes a displacement s in metres in it, given by the relation $s = (1/3)\, t^2$, where t is in s. Work done by the force in 2 s is :

1) (17/3)J

2) (3/8)J

3) (8/3)J

4) (3/17)J

16. A particle moves along a straight line OX. At a time t (in seconds) the distance x (in metres) of the particle from O is given by

$x = 40 + 12t - t^3$

How long would the particle travel before coming to rest ?

1) 14 m   2) 28 m   3) 56 m   4) 70 m

17. The velocity v of a particle at time t is given by $v = at + (b/t + c)$, where a, b and c are constants, The dimensions of a, b and c are respectively :

constants, The dimensions of a, b and c are respectively :

1) $[LT^{-2}]$, $[L]$ and $[T]$

2) $[L]$, $[T]$ and $[LT^2]$

3) $[L^2T^2]$, $[LT]$ and $[L]$

4) $[L]$, $[LT]$ and $[T^2]$

18. A microscope is focussed on a mark on a piece of paper and then a slab of glass of thickness 3 cm and refractive index 1.5 is placed over the mark. How should the microscope be moved to get the mark in focus again ?

1) 1 cm upward

2) 0.5 cm downward

3) 1 cm downward

4) 0.5 cm upward

19. 300 J of work is done in sliding a 2 kg block up an inclined plane of height 10 m. Taking g =10 m/s^2, work done against friction is :

1) 50 J

2) 100 J

3) zero

4) 150 J

20. A transistor is operated in common emitter configuration at constant collector voltage V_c = 1.5 V such that a change in the base current from 100 µA to 150 µA produces a change in the collector current from 5 mA to 10 mA. The current gain (β) is :

1) 50

2) 75

3) 100

4) 125

21. A forward biased diode is :

1) −4V ▸⊢ ‒www‒ −3V

2) 3V ▸⊢ ‒www‒ 5V

3) −2V ▸⊢ ‒www‒ +2V

4) 0V ▸⊢ ‒www‒ −2V

22. A photo-cell employs photoelectric effect to convert :

1) change in the frequency of light into a change in electric voltage

2) change in the intensity of illumination into a change in photoelectric current

3) change in the intensity of illumination into a change in the work function of the photocathode

4) change in the frequency of light into a change in the electric current

23. The core of a transformer is laminated because :

    1) energy losses due to eddy currents may be minimised

    2) the weight of the transformer may be reduced

    3) rusting of the core may be prevented

    4) ratio of voltage in primary and secondary may be increased

24. Two coils of self-inductances 2 mH and 8 mH are placed so close together that the effective flux in one coil is completely linked with the other. The mutual inductance between these coils is :

    1) 8 mH

    2) 12 mH

    3) 4 mH

    4) 16 mH

25. In a discharge tube ionization of enclosed gas is produced due to collisions between :

    1) positive ions and neutral atoms/molecules

    2) negative electrons and neutral atoms/molecules

    3) photons and neutral atoms/molecules

    4) neutral gas atoms/molecules

26. When photons of energy $h\nu$ fall on an aluminium plate (of work function E_0), photoelectrons of maximum kinetic energy K are ejected. If the frequency of the radiation is doubled, the maximum kinetic energy of the ejected photoelectrons will be :

    1) $K + E_0$

    2) 2K

    3) K

    4) $k + h\nu$

27. The following figure shows a logic gate circuit with two inputs A and B and the output C. The voltage waveforms of A, B and C are as shown below :
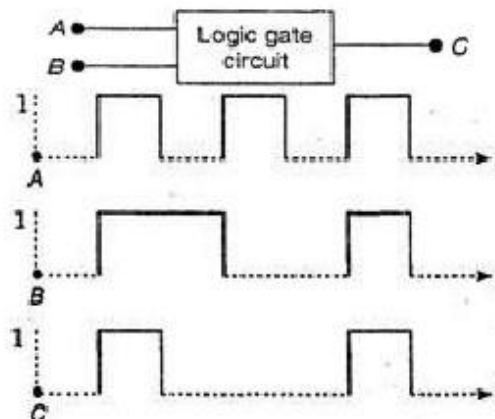
The logic circuit gate is :

    1) AND gate

2) NAND gate

3) NOR gate

4) OR gate

28. A coil of inductive reactance 31 has a resistance of Ω. It is placed in series with a condenser of capacitative reactance 25Ω. The combination is connected to an a.c. soruce of 110 V. The power factor of the circuit is :

   1) 0.40

   2) 0.128

   3) 0.80

   4) 0.66

29. A 0.5 kg ball moving with a speed of 12 m/s strikes a hard wall at an angle of 30° with the wall. It is reflected with the same speed and at the same angle. If the ball is in contact with the wall for 0.25 s, the average force acting on the wall is :

   1) 8 N   2) 24 N   3) 16 N   4) 96 N

30. The moment of inertia of a uniform circular disc of radius R and mass M about an axis touching the disc at its diameter and normal to the disc is :

   1) MR^2

   2) $(2/5)MR^2$

   3) $(3/5)MR^2$

   4) $(5/6)MR^2$

31. The momentum of a photon of energy 1 MeV in kg m/s, will be :

   1) 0.33×10^6

   2) 8×10^{-24}

   3) 5×10^{-23}

   4) 5×10^{-22}

32. The radius of germanium (Ge) nuclide is measured to be twice the radius of $_{4}^{9}Be$. The number of nucleons in Ge are :

   1) 73   2) 74   3) 76   4) 72

33. The molar specific heat at constant pressure of an ideal gas is (7/2)R. The ratio of specific heat at constant pressure to that at constant volume is :

    1) 7/5 2) 6/7 3) 9/7 4) 4/7

34. The earth is assumed to be a sphere of radius R. A platform is arranged at a height R from the surface of the earth. The escape velocity of a body from this platform is fv_e, where v_e is its escape velocity from the surface of the earth. The value of f is :

    1) 2 2) $1/\sqrt{2}$ 3) 1/3 4) 1

35. Two sound waves with wavelengths 5.0 m and 5.5 m respectively, each propagate in a gas with velocity 330 m/s. We expect the following number of beats per second :

    1) 12 2) 0 3) 3 4) 6

36. Power dissipated across the 8 resistor in the circuit shown here is 2 W. The power dissipated in watt units across the 3 Ω resistor is :
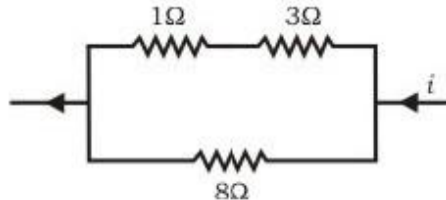
    1) 6.0
    2) 1.5
    3) 0.45
    4) 3.0

37. Kirchhoff's first and second laws for electrical circuits are consequences of :

    1) conservation of energy
    2) conservation of electric charge and energy respectively
    3) conservation of electric charge
    4) conservation of energy and electric charge respectively

38. A transverse wave propagating along x-axis is represented by :
    $y(x, t) = 8.0 \sin (0.5\pi x - 4\pi t - (\pi/4))$
    where x is in metres and t is in seconds. The speed of the wave is :

    1) 8π m/s
    2) 0.5π m/s
    3) $(\pi/4)$ m/s
    4) 8 m/s

39. The time of reverberation of a room A is one second. What will be the time (in seconds) of reverberation of a room, having all the dimensions double of those of room A ?

    1) 2 2) 4 3) 1/2 4) 8

40. Which one of the following statements is true ?

40. Which one of the following statements is true ?

    1) Both light and sound waves in air are transverse

    2) The sound waves in air are longitudinal while the light waves are transverse

    3) Both light and sound waves in air are longitudinal

    4) Both light and sound waves can travel in vacuum

41. Above Curie temperature :

    1) a ferromagnetic substance becomes paramagnetic

    2) a paramagnetic substance becomes diamagnetic

    3) a diamagnetic substance becomes paramagnetic

    4) a paramagnetic substance becomes ferromagnetic

42. A convex lens and a concave lens, each having same focal length of 25 cm, are put in contact to form a combination of lenses. The power in diopters of the combination is :

    1) 25   2) 50   3) infinite   4) zero

43. An electric dipole of moment $\vec{P}$ is lying along a uniform electric field . The work done in rotating the dipole by 90° is :

    1) $\sqrt{2}\, pE$

    2) $pE/2$

    3) $2pE$

    4) pE

44. A parallel plate air capacitor is charged to a potential difference of V volts. After disconnecting the charging battery the distance between the plates of the capacitor is increased using an insulating handle. As a result the potential difference between the plates :

    1) decreases

    2) does not change

    3) becomes zero

    4) increases

45. A car runs at a constant speed on a circular track of radius 100 m, taking 62.8 s for every circular lap. The average velocity and average speed for each circular lap respectively is :

    1) 0, 0

    2) 0, 10 m/s

    3) 10 m/s, 20 m/s

    4) 20 m/s, 0

46. A square surface of side L m is in the plane of the paper. A uniform electric field $\vec{E}$ (V/m), also in the plane of the paper, is limited only to the lower half of the square surface, (see figure). The electric flux in SI units associated with the surface is :
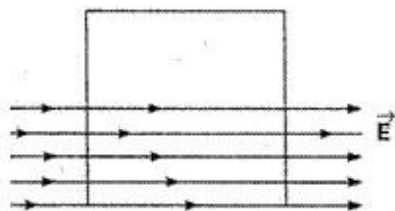
1) $EL^2/(2\varepsilon_0)$

2) $EL^2/2$

3) zero

4) EL^2

47. A tube of length L is filled completely with an incompressible liquid of mass M and closed at both the ends. The tube is then rotated in a horizontal plane about one of its ends with a uniform angular velocity ω. The force exerted by the liquid at the other end is :

1) $(ML\omega^2)/(2)$

2) $(ML^2\omega)/(2)$

3) $2ML\omega^2$

4) $(ML^2\omega^2)/(2)$

48. A uniform rod of length l and mass m is free to rotate in a vertical plane about A. The rod initially in horizontal position is released. The initial angular acceleration of the rod is : (Moment of inertia of rod about A is $(ml^2/3)$)
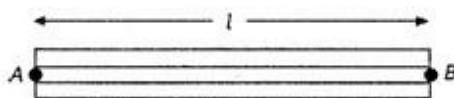
1) 3g/2l

2) 2l/3g

3) $3g/2l^2$

4) mg(l/2)

49. The vectors $\vec{A}$ and $\vec{B}$ are such that a :

$$\left|\vec{A}+\vec{B}\right|=\left|\vec{A}-\vec{B}\right|$$

The angle between the two vectors is :

1) 90°   2) 60°   3) 30°   4) 0°

50. Two bodies, A (of mass 1 kg) and B (of mass 3 kg) are dropped from heights of 16 m and 25 m, respectively. The ratio of the time taken by them to reach the ground is :

1) 5/4   2) 8/5   3) 5/8   4) 4/5

Chemistry

51. Identify the correct statement for change of Gibbs energy for a system (ΔG_{system}) at constant temperature and pressure :

9

1) If $\Delta G_{system} > 0$, the process is spontaneous

2) If $\Delta G_{system} = 0$, the system has attained equilibrium

3) If $\Delta G_{system} = 0$, the system is still moving in a particular direction

4) If $\Delta G_{system} < 0$, the process is not spontaneous

52. A solution containing 10g per dm^3 of urea (molecular mass = 60g mol^{-1}) is isotonic with a 5% solution of a non-volatile solute. The molecular mass of this non-volatile solute is :

1) 200 g mol^{-1}

2) 300 g mol^{-1}

3) 400 g mol^{-1}

4) 500 g mol^{-1}

53. A plot of log x/m versus log p for the adsorption of a gas on a solid gives a straight line with slope equal to :

1) $- \log k$

2) n

3) 1/n

4) log k

54. Assume each reaction is carried out in an open container. For which reaction will $\Delta H = \Delta E$?

1) $H_2(g) + Br_2(g) \rightarrow 2HBr(g)$

2) $C(s) + 2H_2O(g) \rightarrow 2H_2(g) + CO_2(g)$

3) $PCl_5(g) \rightarrow PCl_3(g) + Cl_2(g)$

4) $2CO(g) + O_2(g) \rightarrow 2CO_2(g)$

55. In a set of reactions propionic acid yielded a compound D.

$CH_3CH_2COOH \xrightarrow{SOCl_2} B \xrightarrow{NH_3} C \xrightarrow[Br_2]{KOH} D$
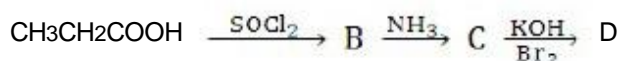
The structure of D would be :

1) $CH_3CH_2CH_2NH_2$

2) $CH_3CH_2CONH_2$

3) $CH_3CH_2NHCH_3$

4) $CH_3CH_2NH_2$

56. During the process of digestion, the proteins present in food materials are hydrolysed to amino acids. The two enzymes involved in the process

Process $\xrightarrow{\text{Enzyme (A)}}$ Polypeptides $\xrightarrow{\text{Enzyme (B)}}$ Amino acids, are respectively :
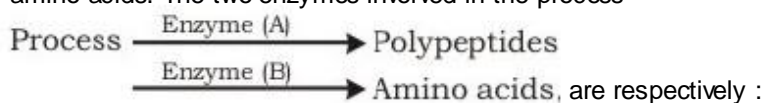
1) amylase and maltase

2) diastase and lipase

3) pepsin and trypsin

4) invertase and zymase

57. The human body does not produce :

1) DNA

2) vitamins

3) hormones

4) enzymes

58. CsBr crystallises in a body centred cubic lattice. The unit cell length is 436.6 pm. Given that the atomic mass of Cs = 133 and that of Br = 80 amu and Avogadro number being 6.02×10^{23} mol^{-1}, the density of CsBr is :

1) 42.5 g/cm^3

2) 2.25 g/cm^3

3) 0.225 g/cm^3

4) 4.25 g/cm^3

59. More number of oxidation states are exhibited by the actinoids than by the lanthanoids. The main reason for this is :

1) more energy difference between 5f and 6d orbitals than that between 4f and 5d orbitals

2) lesser energy difference between 5f and 6d orbitals than that between 4f and 5d orbitals

3) greater metallic character of the lanthanoids than that of the corresponding actinoids

4) more active nature of the actinoids

60. Given : The mass of electron is 9.11×10^{-31} kg

Planck constant is 6.626×10^{-34} Js, the uncertainty involved in the measurement of velocity within a distance of 0.1 Å is :

1) 5.79×10^6 ms^{-1}

2) 5.79×10^7 ms^{-1}

3) 5.79×10^8 ms^{-1}

4) 5.79×10^9 ms^{-1}

61. Copper sulphate dissolves in excess of KCN to give :

1) CuCN

2) $[Cu(CN)_4]^{3-}$

3) $[Cu(CN)_4]^{2-}$

4) $Cu(CN)_2$

62. In which of the following pairs are both the ions coloured in aqueous solution ?

(At. no. : Sc = 21, Ti = 22, Ni = 28, Cu = 29, Co = 27)

   1) Ni^{2+}, Ti^{3+}

   2) Sc^{3+}, Ti^{3+}

   3) Sc^{3+}, Co^{2+}

   4) Ni^{2+}, Cu^{+}

63. Al_2O_3 can be converted to anhydrous $AlCl_3$ by heating :

   1) Al_2O_3 with HCl gas

   2) Al_2O_3 with NaCl in solid state

   3) a mixture of Al_2O_3 and carbon in dry Cl_2 gas

   4) Al_2O_3 with Cl_2 gas

64. The enthalpy and entropy change for the reaction :
   $Br_2(l) + Cl_2(g) \rightarrow 2BrCl(g)$
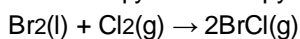
   are 30 kJ mol^{-1} and 105 JK^{-1} mol^{-1} respectively. The temperature at which the reaction
   will be in equilibrium is :

   1) 285.7 K

   2) 373 K

   3) 250 K

   4) 400 K

65. The appearance of colour in solid alkali metal halides is generally due to :

   1) F-centres

   2) Schottky defect

   3) Frenkel defect

   4) Interstitial positions

66. The general molecular formula, which represents the homologous series of alkanols is :

   1) $C_nH_{2n}O_2$

   2) $C_nH_{2n}O$

   3) $C_nH_{2n+1}O$

   4) $C_nH_{2n+2}O$

67. If $E^\circ_{Fe^{2+}/Fe}$ = -0.441 V and
   $E^\circ_{Fe^{3+}/Fe^{2+}}$ = 0.771 V, the standard emf of the reaction :
 $Fe + 2Fe^{3+} \rightarrow 3Fe^{2+}$ will be :

   1) 0.441 V

   2) 1.753 V

   3) 1.212 V

   4) 0.211 V

68. For the reaction $2A + B \rightarrow 3C + D$

which of the following does not express the reaction rate ?

1) $-(d[C]/3dt)$

2) $-(d[B]/dt$

3) $d[D]/dt$

4) $-d[A]/2dt$

69. For the reaction,

$CH_4(g) + 2O_2 (g) \rightleftharpoons CO_2(g) + 2H_2O(l)$, $\Delta_rH = -170.8\ kJ\ mol^{-1}$ Which of the following statements is not true ?

1) At equilibrium, the concentrations of CO_2 (g) and H_2O (l) are not equal

2) The equilibrium constant for the reaction is given by $K_p = [CO_2]/[CH_4][O_2]$

3) Addition of $CH_4(g)$ or $O_2(g)$ at equilibrium will cause a shift to the right

4) The reaction is exothermic

70. $[NH(CH_2)NHCO(CH_2)_4CO]_n$ is a :

1) co-polymer

2) addition polymer

3) thermo-setting polymer

4) homopolymer

71. A carbonyl compound reacts with hydrogen cyanide to form cyanohydrin which on hydrolysis forms a racemic mixture of α-hydroxy acid. The carbonyl compound is :

1) acetaldehyde

2) acetone

3) diethyl ketone

4) formaldehyde

72. Which one of the following is a peptide hormone ?

1) Glucagon

2) Testosterone

3) Thyroxin

4) Adrenaline

73. The major organic product in the reaction,

$CH_3 - O - CH(CH_3)_2 + HI \rightarrow$ Product is :

1) $CH_3OH + (CH_3)_2CHI$

2) $ICH_2OCH (CH_3)_2$

3) $CH_3O\ C(CH_3)_2$
           |
           I

4) $CH_3I + (CH_3)_2CHOH$
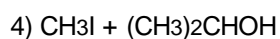
74. Nucleophilic addition reaction will be most favoured in :

1)

$$CH_3-CH_2-CH_2\overset{\overset{\displaystyle O}{\displaystyle \|}}{C}-CH_3$$

2) $(CH_3)_2C = O$

3) CH_3CH_2CHO

4) CH_3CHO
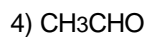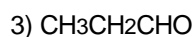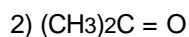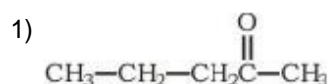
75. The enthalpy of combustion of H_2, cyclohexene (C_6H_{10}) and cyclohexene (C_6H_{12}) are -241, -3800 and -3920 kJ per mol respectively. Heat of hydrogenation of cyclohexene is :

1) - 121 kJ per mol

2) + 121 kJ per mol

3) + 484 kJ per mol

4) - 484 kJ per mol

76. Self condensation of two moles of ethyl acetate in presence of sodium ethoxide yields :
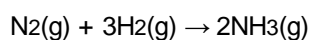
1) ethyl butyrate

2) acetoacetic ester

3) methyl acetoacetate

4) ethyl propionate

77. Consider the reaction

$N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$

The equality relationship between $(d[NH_3]/dt)$ and $-(d[H_2]/dt)$ is :

1) $(d[NH_3]/dt) = -(1/3)(d[H_2]/dt)$

2) $+(d[NH_3]/dt) = -(2/3)(d[H_2]/dt)$

3) $+(d[NH_3]/dt) = -(3/2)(d[H_2]/dt)$

4) $(d[NH_3]/dt) = -(d[H_2]/dt)$

78. Which of the following is not chiral ?

1) 2-butanol

2) 2, 3-dibromopentane

3) 3-bromopentane

4) 2-hydroxypropanoic acid

79. $[Co(NH_3)_4(NO_2)_2]Cl$ exhibits :

1) linkage isomerism, ionization isomerism and optical isomerism

2) linkage isomerism, ionization isomerism and geometrical isomerism

3) ionization isomerism, geometrical isomerism and optical isomerism

4) linkage isomerism, geometrical isomerism and optical isomerism

80. $[Cr(H_2O)_6]Cl_3$ (at. no. of Cr = 24) has a magnetic moment of 3.83 BM, the correct distribution of 3d electrons in the chromium of the complex is :

1) $3d^1_{x^2-y^2}, 3d^1_{z^2}, 3d^1_{xz}$

2) $3d^1_{xy}, 3d^1_{x^2-y^2}, 3d^1_{yz}$

3) $3d^1_{xy}, 3d^1_{zy}, 3d^1_{xz}$

4) $3d^1_{xy}, 3d^1_{yz}, 3d^1_{z^2}$

81. 1.00 g of a non-electrolyte solute (molar mass 250g mol-1) was dissolved in 51.2 g of benzene. If the freezing point depression constant, K_f of benzene is 5.12 K kg mol-1, the freezing point of benzene will be lowered by :

1) 0.4 K

2) 0.8 K

3) 0.12 K

4) 0.24 K

82. Which of the following pairs constitutes a buffer ?

1) HNO_2 and $NaNO_2$

2) NaOH and NaCl

3) HNO_3 and NH_4NO_3

4) HCl and KCl

83. The hydrogen ion concentration of a 10-8 M HCl aqueous solution at 298 K (K_w = 10-14) is :

1) 1.0525 x 10-6 M

2) 1.0525 x 10-7 M

3) 8.525 x 10-8 M

4) 1.0525 x 10-8 M

84. A solution of acetone in ethanol :

1) shows a negative deviation from Raoult's law

2) shows a positive deviation from Raoult's law

3) behaves like a near ideal solution

4) obeys Raoult's law

85. A hypothetical electrochemical cell is shown below
A|A+ (xM)|| B+ (yM)| B
The emf measured is +0.20V. The cell reaction is :

1) A+ + B → A + B+

2) A+ + e- → A; B+ + e- → B

3) the cell reaction cannot be predicted

4) A + B+ → A+ + B

86. Ethylene oxide when treated with Grignard reagent yields :

    1) secondary alcohol

    2) tertiary alcohol

    3) cyclopropyl alcohol

    4) primary alcohol

87. During osmosis, flow of water through a semi-permeable membrane is :

    1) from solution having higher concentration only

    2) from both sides of semi-permeable membrane with equal flow rates

    3) from both sides of semi-permeable membrane with unequal flow rates

    4) from solution having lower concentration only

88. Which of the following is more basic than aniline ?

    1) Diphenylamine

    2) Triphenylamine

    3) p-nitroaniline

    4) Benzylamine

89. In which of the following molecules are all the bonds not equal ?

    1) ClF_3

    2) BF_3

    3) AlF_3

    4) NF_3

90. The electronegativity difference between N and F is greater than that between N and H yet the dipole moment of NH_3 (1.5 D) is larger than that of NF_3 (0.2 D). This is because :

    1) in NH_3 as well as in NF_3 the atomic dipole and bond dipole are in the same direction

    2) in NH_3 the atomic dipole and bond dipole are in the same direction whereas in NF_3 these are in opposite directions

    3) in NH_3 as well as NF_3 the atomic dipole and bond dipole are in opposite directions

    4) in NH_3 the atomic dipole and bond dipole are in the opposite directions whereas in NF_3 these are in the same directions

91. The correct order of the mobility of the alkali metal ions in aqueous solution is :

    1) Li+ > Na+ > K+ > Rb+

    2) Na+ > K+ > Rb+ > Li+

3) K+ > Rb+ > Na+ > Li+

4) Rb+ > K+ > Na+ > Li+

92. The corect order regarding the electronegativity of hybrid orbitals of carbon is :

1) $sp > sp2 < sp3$

2) $sp > sp2 > sp3$

3) $sp < sp2 > sp3$

4) $sp < sp2 < sp3$

93. Which of the following species has a linear shape ?

1) NO_2^-

2) SO_2

3) NO_2^+

4) O_3

94. Which of the following is the most basic oxide ?

1) Al_2O_3

2) Sb_2O_3

3) Bi_2O_3

4) SeO_2

95. The orientation of an atomic orbital is governed by :

1) azimuthal quantum number

2) spin quantum number

3) magnetic quantum number

4) principal quantum number

96. Which of the following is not a correct statement ?

1) The electron-deficient molecules can act as Lewis acids

2) The canonical structures have no real existence

3) Every AB_5 molecule does in fact have square pyramid structure

4) Multiple bonds are always shorter than corresponding single bonds

97. The number of unpaired electrons in a paramagnetic diatomic molecule of an element with atomic number 16 is :

1) 2   2) 3   3) 4   4) 1

98. Which one of the following orders is not in accordance with the property stated against it?

1) $F_2 > Cl_2 > Br_2 > I_2$: Oxidising power

2) HI > HBr > HCl > HF : Acidic property in water

3) F$_2$ > Cl$_2$ > Br$_2$ > I$_2$: Electronegativity

4) F$_2$ > Cl$_2$ > Br$_2$ > I$_2$: Bond dissociation energy

99. Which of the following is not isostructural with SiCl$_4$?

1) SCl$_4$

2) SO$_4^{2-}$

3) PO$_4^{3-}$

4) NH$_4^+$

100.

The IUPAC name of is :

1) 3, 4-dimethylpentanoyl chloride

2) 1-chloro-1-oxo-2, 3-dimethylpentane

3) 2-ethyl-3-methylbutanoyl chloride

4) 2, 3-dimethylpentanoyl chloride

Biology

101. What would be the number of chromosomes in the cells of the aleurone layer in a plant species with 8 chromosomes in its synergids ?

1) 16   2) 24   3) 32   4) 8

102. Pineapple (annanas) fruit develops from :

1) a unilocular polycarpillary flower

2) a multipistillate syncarpous flower

3) a cluster of compactly borne flowers on a common axis

4) a multilocular monocarpillary flower

103. Golden rice is a promising transgenic crop. When released for cultivation, it will help in :

1) alleviation of vitamin-A deficiency

2) pest resistance

3) herbicide tolerance

4) producing a petrol-like fuel from rice

104. Parthenocarpic tomato fruits can be produced by :

1) removing androecium of flowers before pollen grains are released

2) treating the plants with low concentrations of gibberellic acid and auxins

3) raising the plants from vernalized seeds

4) treating the plants with phenylmercuric acetate

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