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Previous Year Paper

Chemistry - 2007



Multiple Choice Questions

1. For an electron impossible combination of quantum number is

- A. $n = 3; l = 2; m_l = -2; m_s = +1/2$
- B. $n = 3; l = 2; m_l = -3; m_s = +1/2$
- C. $n = 4; l = 0; m_l = 0; m_s = -1/2$
- D. $n = 5; l = 3; m_l = 0; m_s = -1/2$

Answer

2. The energy of an electron in n^{th} orbit of hydrogen atom is

- A. $13.6n^4\text{eV}$
- B. $13.6n^3\text{eV}$
- C. $-13.6n^2\text{eV}$
- D. $13.6n\text{eV}$

Answer

3. Which of the following is not iso-electronic?

- A. Na^+
- B. Mg^{2+}
- C. O^{2-}
- D. Cl^-

Answer

4. The number of unpaired electrons is maximum in (Atomic number Ti = 22; V = 23; Cr = 24; Fe = 26)

- A. Fe
- B. Cr
- C. Ti
- D. V

Answer

5. On moving from left to right in the second period along the periodic table the atomic volume of the element

- A. increases with constant velocity
- B. remains unchanged
- C. first increases and then decreases

D. decreases

6. Which of the following is the correct order of the size of iodine species?

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A. $I > I^- > I^+$

B. $I^- > I > I^+$

C. $I^+ > I > I^-$

D. $I > I^+ > I^-$

Answer

7. First ionisation potential of Be and B will be

A. 8.8 and 8.8

B. 6.6 and 6.6

C. 6.6 and 8.8

D. 8.8 and 6.6

Answer

8. Which of the following electronic configuration will have maximum IP difference between IInd and IIIrd ionisation potential?

A. $1s^2, 2s^2 2p^6, 3s^1$

B. $1s^2, 2s^2 2p^6, 3s^2$

C. $1s^2, 2s^2 2p^6$

D. $1s^2, 2s^2 2p^5$

Answer

9. Which of the following is true for a reaction in which all the products are liquid?

A. $\Delta H = \Delta E$

B. $\Delta H = \Delta W$

C. $\Delta H > \Delta E$

D. None of these

Answer

10. Cell reaction is spontaneous when

A. ΔG° is negative

B. ΔG° is positive

C. ΔE_{red}° is positive

D. ΔE_{red}° is negative

Answer

11. At 27°C latent heat of fusion of a compound is 2930 J/ mol, then entropy change is

A. 9.77 J/mol-K

B. 10.77 J/ mol-K

C. 9.07 J/ mol-K

D. 0.977 J/ mol-K

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12. For the reaction,



which one is true?

- A. $\Delta H = \Delta E - RT$
- B. $\Delta H = \Delta E + RT$
- C. $\Delta H = \Delta E + 2RT$
- D. $\Delta H = \Delta E - 2RT$

Answer

13. 1.1 moles of A and 2.2 moles of B are mixed in a container of one litre volume to obtain the equilibrium $\text{A} + 2\text{B} \rightleftharpoons 2\text{C} + \text{D}$.

At equilibrium 0.2 moles of C are formed. The equilibrium constant for the above reaction is

- A. 0.001
- B. 0.002
- C. 0.003
- D. 0.004

Answer

14. In which solution/ solvent the solubility of AgCl is minimum?

- A. 0.01 M NaCl
- B. 0.01 M CaCl_2
- C. Pure water
- D. 0.001 M AgNO_3

Answer

15. Which one of the following salts gives an acidic solution in water?

- A. CH_3COONa
- B. NH_4Cl
- C. NaCl
- D. $\text{CH}_3\text{COONH}_4$

Answer

16. Which of the following exhibits highest solubility in water?

- A. NH_3
- B. PH_3
- C. AsH_3
- D. SbH_3

Answer

17. The ionic radii of N^{3-} , O^{2-} , F^- and Na^+ follow the order

$\text{N}^{3-} > \text{O}^{2-} > \text{F}^- > \text{Na}^+$
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D. $\text{O}^{2-} > \text{F}^- > \text{Na}^+ > \text{N}^3-$

Answer

18. The vapour pressure decreases by 10 mm of Hg when mole fraction of solute in a solution is 0.2.

If the vapour pressure decreases to 20 mm of Hg then the mole fraction of solute will be

- A. 0.2
- B. 0.4
- C. 0.6
- D. 0.8

Answer

19. What is the entropy change (in $\text{JK}^{-1} \text{mol}^{-1}$) when one mole of ice is converted into water at 0°C ?

(The enthalpy change for the conversion of ice to liquid water is 6.0 kJ mol^{-1} at 0°C).

- A. 20.13
- B. 2.013
- C. 2.198
- D. 21.98

Answer

20. The molar heat capacity (C) of water at constant pressure, is $75 \text{ JK}^{-1} \text{mol}^{-1}$. When 1.0 kJ of heat is supplied to 100 g of water which is free to expand, the increase in temperature of water is

- A. 1.2 K
- B. 2.4 K
- C. 4.8 K
- D. 6.6 K

Answer

21. Which of the following pairs of a chemical reaction is certain to result in a spontaneous reaction?

- A. Endothermic and decreasing disorder
- B. Exothermic and increasing disorder
- C. Endothermic and increasing disorder
- D. Exothermic and decreasing disorder

Answer

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

- A. If $\Delta G_{\text{system}} = 0$, the system has attained equilibrium
- B. If $\Delta G_{\text{system}} = 0$, the system is still moving in a particular direction
- C. If $\Delta G_{\text{system}} = 0$, the process is not spontaneous
- D. If $\Delta G_{\text{system}} = 0$, the process is spontaneous

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23. The standard emf of a galvanic cell involving cell reaction with $n = 2$ is found to be 0.295 V at 25°C. The equilibrium constant of the reaction would be

- A. 2.0×10^{11}
- B. 4.0×10^{12}
- C. 1.0×10^2
- D. 1.0×10^{10}

Answer

24. ${}_nX^m$ emit one α and two β^- particles. It is converted into

- A. ${}_nX^{m-4}$
- B. ${}_{n-1}X^{m-1}$
- C. ${}_nZ^{m-4}$
- D. None of these

Answer

25. 18 carat gold contains

- A. 18% gold
- B. 24% gold
- C. 75% gold
- D. 60% gold

Answer

26. Which of the following metals will not form an amalgam?

- A. Gold
- B. Silver
- C. Zinc
- D. Iron

Answer

27. The element which liberates oxygen gas from water is

- A. P
- B. Na
- C. F
- D. I

Answer

28. Which is the weakest acid out of HF, HCl, HBr and HI?

- A. HF
- B. HCl
- C. HBr

D. HI

29. The strongest oxidising agent amongst F_2 , Cl_2 , Br_2 and I_2 is

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A. F_2

B. I_2

C. Cl_2

D. Br_2

Answer

30. A compound has the empirical formula CH_2O . Its vapour density is 30. Its molecular formula is

A. $C_2H_4O_2$

B. C_2H_6O

C. $C_2H_6O_2$

D. C_2H_4O

Answer

31. 64 g of an organic compound contains 24 g of carbon, 8 g of hydrogen and the rest oxygen. The empirical formula of the compound is

A. CH_2O

B. C_2H_4O

C. CH_4O

D. C_2H_8O

Answer

32. Which of the following is an organo-metallic compound?

A. Lithium ethoxide

B. Ethyl lithium

C. Lithium acetate

D. Lithium carbide

Answer

33. H_2O_2 on oxidation gives

A. O^{2-}

B. OH^-

C. O_2^-

D. O_2

Answer

34. The oxidation states of sulphur in the anions SO_3^{2-} , $S_2O_4^{2-}$ and $S_2O_6^{2-}$ follow the order

A. $S_2O_4^{2-} < SO_3^{2-} < S_2O_6^{2-}$

B. $SO_3^{2-} < S_2O_4^{2-} < S_2O_6^{2-}$

C. $S_2O_4^{2-} < S_2O_6^{2-} < SO_3^{2-}$

D. $S_2O_6^{2-} < S_2O_4^{2-} < SO_3^{2-}$

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35. Very dilute nitric acid reacts with zinc to form zinc nitrate and

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A. ammonium nitrate

B. NO_2

C. NO

D. N_2O

Answer

36. Acetic acid dissolved in benzene shows molecular weight

A. 60

B. 120

C. 180

D. 240

Answer

37. Volume of CO_2 obtained by the complete decomposition of 9.85 g BaCO_3 is

A. 2.24 L

B. 1.12 L

C. 0.84 L

D. 0.56 L

Answer

38. The molecular formula of bleaching powder is

A. CaCl_2

B. Ca_2OCl_2

C. CaOCl_2

D. $\text{CaCl}_2 \cdot \text{CaOCl}$

Answer

39. A solution of sodium metal in liquid ammonia is a strong reducing agent due to the presence of

A. sodium atoms

B. sodium hydride

C. sodium amide

D. solvated electron

Answer

40. A mixture containing Cu^{2+} and Ni^{2+} can be separated for identification by

A. passing H_2S in acid medium

B. passing H_2S in alkaline medium

C. passing H_2S in neutral medium

D. passing H_2S in dry mixture

Answer

41. The indicator used in the titration of acetic acid with sodium hydroxide for quantitative
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A. phenolphthalein

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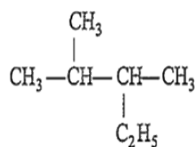
B. methyl orange

C. methyl red

D. a mixture of methyl red and methyl orange

Answer

42. The IUPAC, name of the compound



A. 2-ethyl-3-methyl butane

B. 2, 3-dimethyl pentane

C. 2-methyl-3-ethyl butane

D. 3,4-dimethyl pentane

Answer

43. $[\text{Pt}(\text{NH}_3)_4\text{Cl}_2]\text{Br}_2$ and $[\text{Pt}(\text{NH}_3)_4\text{Br}_2]\text{Cl}_2$ are related to each other as

A. optical isomers

B. coordinate isomers

C. ionisation isomers

D. linkage isomers

Answer

44. Which one of the following substances is used as an anti-knock compound?

A. Tetra ethyl lead

B. Lead tetrachloride

C. Lead acetate

D. Ethyl acetate

Answer

45. How many isomeric butanes are there?

A. 2

B. 3

C. 4

D. 5

Answer

46. Ethene gives with acidic KMnO_4 solution

A. ethylene glycol

B. ethylene oxide

C. formaldehyde

D. acetaldehyde

Answer

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47. At normal room temperature iodoform is

- A. volatile liquid
- B. thick viscous liquid

C. gas

D. solid

Answer

48. The formula of freon-12 is

- A. CClF_3
- B. CH_2Cl_2
- C. CCl_2F_2
- D. CH_2F_2

Answer

49. Which of the following is reducing agent?

- A. LiAlH_4
- B. $\text{Zn} + \text{HCl}$
- C. $\text{Sn} + \text{HCl}$
- D. All of the above

Answer

50. The volume strength of 1.5 N H_2O_2 solution is

- A. 8.4
- B. 4.8
- C. 5.2
- D. 8.8

Answer

51. A cell, with cell constant 0.4 cm^{-1} , has the resistance of 40 ohm of a 0.01 M solution of an electrolyte, then the molar conductivity in $\text{ohm}^{-1} \text{ cm}^2 \text{ mol}^{-1}$ will be

- A. 10^4
- B. 10^3
- C. 10^2
- D. 1

Answer

52. If the standard electrode potential for the cell $\text{Zn} | \text{Zn}^{2+} (\text{aq}) || \text{Cu}^{2+} (\text{aq}) | \text{Cu}$ is 1.10 V, then the maximum work done by this cell will be

- A. -106.15 kJ
- B. -212.30 kJ
- C. -318.45 kJ
- D. -424.60 kJ

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53. $3A \rightarrow 2B$, rate of reaction $+\frac{d(B)}{dt}$ is equal to

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A. $-3\frac{dA}{dt}$

B. $-2\frac{dA}{dt}$

C. $-1\frac{dA}{dt}$

D. $+2\frac{dA}{dt}$

Answer

54. $2A \rightarrow B + C$

It would be a zero order reaction when

A. the rate of reaction is proportional to square of concentration of A

B. the rate of reaction remains same at any concentration of A

C. the rate remains unchanged at any concentration of B and C

D. the rate of reaction doubles if concentration of B is increased to double

Answer

55. The reaction $A \rightarrow B$ follows first order kinetics. The time taken for 0.8 mole of A to produce 0.6 mole of B is 1 h. What is the time taken for conversion of 0.9 mole of A to produce 0.675 mole of B?

A. 1 h

B. 0.5 h

C. 0.25 h

D. 2 h

Answer

56. Chlorine cannot displace

A. fluorine from NaF

B. iodine from NaI

C. bromine from NaBr

D. None of the above

Answer

57. The structure of ionic compound with Schottky defects has

A. same number of cationic and anionic vacancies

B. anionic vacancy and interstitial anion

C. cationic vacancies

D. cationic vacancies and interstitial cation

Answer

58. If a pentavalent impurity is mixed in the crystal-lattice of germanium then the semiconductor formed will be

A. p-type semiconductor

B. n-type semiconductor

C. (a) and (b) both

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Answer

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59. A compound formed by elements X and Y crystallises in a cubic structure in which the X atoms are at the corners of a cube and the Y atoms are at the face centres. The formula of the compound is
- XY_3
 - X_3Y
 - XY
 - XY_2

Answer

60. In a face centred cubic lattice, a unit cell is shared equally by how many unit cells?
- 4
 - 2
 - 6
 - 8

Answer

61. During osmosis, flow of water through a semi-permeable membrane is
- from both sides of semi-permeable membrane with equal flow rate
 - from solution having lower concentration only
 - from solution having higher concentration only
 - None of the above

Answer

62. In electrolysis of NaCl when Pt electrode is taken then H_2 is liberated at cathode while with Hg electrode it forms sodium amalgam
- Hg is more inert than Pt
 - more voltage is required to reduce H^+ at Hg than at Pt
 - Na is dissolved in Hg while it does not dissolve in Pt
 - concentration of H^+ ions is larger when Pt electrode is taken

Answer

63. On the basis of the information available from the reaction,
- $$43Al + O_2 \rightarrow 23 Al_2O_3$$
- $\Delta G = -827 \text{ kJ mol}^{-1}$ of O_2 , the minimum emf required to carry out an electrolysis of Al_2O_3 is ($F = 96500 \text{ mol}^{-1}$)
- 2.14 V
 - 4.28 V
 - 6.42 V
 - 8.56 V

64. 4.5 g of aluminium (atomic mass 27 u) is deposited at cathode from Al^{3+} solution by a certain quantity of electric charge. The volume of hydrogen produced at STP from H^+ ions in solution by the same quantity of electric charge will be

- A. 44.8 L
- B. 11.2 L
- C. 22.4 L
- D. 5.6 L

Answer

65. The time of completion of 90% of a first order reaction is approximately

- A. 1.1 times that of half-life
- B. 2.2 times that of half-life
- C. 3.3 times that of half-life
- D. 4.4 times that of half-life

Answer

66. The rate of reaction between two reactants A and B decreases by a factor of 4, if the concentration of reactant B is doubled. The order of this reaction with respect to reactant B is

- A. 2
- B. -1
- C. 1
- D. -2

Answer

67. In a first-order reaction $\text{A} \rightarrow \text{B}$, if k is rate constant and initial concentration of reactant A is 0.5 M then, the half-life is

- A. $\ln 2k$
- B. $0.6930.5$
- C. $\log 22k$
- D. $\log 2k 0.5$

Answer

68. Which ion is colourless?

- A. Cr^{4+}
- B. Sc^{3+}
- C. Ti^{3+}
- D. V^{4+}

Answer

69. Which of the following statement is not correct?

- A. $\text{La}(\text{OH})_3$ is less basic than $\text{Lu}(\text{OH})_3$.

- B. In lanthanide series ionic radius of Lu^{3+} ion decreases.

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Answer

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70. Four successive members of the first row transition elements are listed below with their atomic numbers. Which one of them is expected to have the highest third ionisation enthalpy?
- A. Vanadium ($Z = 23$)
 - B. Manganese ($Z = 25$)
 - C. Chromium ($Z = 24$)
 - D. Iron ($Z = 26$)

Answer

71. Which of the following will replace Br_2 from the aqueous solution having bromide ion?
- A. Cl_2
 - B. I_3^-
 - C. I_2
 - D. Cl^-

Answer

72. If 2.0 g of a radioactive substance has half-life of 7 days, the half-life of 1 g sample is
- A. 7 days
 - B. 14 days
 - C. 28 days
 - D. 35 days

Answer

73. According to the adsorption theory of catalysis the speed of the reaction increase because
- A. the concentration of reactant molecules at the active centres of the catalyst becomes high due to adsorption
 - B. in the process of adsorption, the activation energy of the molecules becomes large
 - C. absorption produces heat which increases the speed of the reaction
 - D. adsorption lowers the activation energy of the reaction

Answer

74. In the metallurgy of which of the following cupellation process is used?
- A. Copper
 - B. Silver
 - C. Iron
 - D. Aluminium

Answer

75. Cryolite is used in the electrolytic extraction of aluminium
- A. to obtain more aluminium
 - B. to decompose bauxite
 - C. to protect anodes

D. as a reducing agent

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76. The brass is an alloy of

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- A. gold and copper
- B. silver and zinc
- C. copper and zinc
- D. copper and aluminum

Answer

77. Which of the following is pseudo halogen?

- A. IF_7
- B. $(\text{CN})_2$
- C. ICl_2^-
- D. I_3^-

Answer

78. Which element from group V gives most basic compound with hydrogen?

- A. Nitrogen
- B. Bismuth
- C. Arsenic
- D. Phosphorus

Answer

79. Point out in which of the following properties oxygen differs from the rest of the members of its family (Group-VIA)?

- A. High value of ionisation energies
- B. Oxidation states (2,4,6)
- C. Polymorphism
- D. Formation of hydrides

Answer

80. Which of the following properties increases on going down from F to I in group VII-A of the periodic table?

- A. Electronegativity
- B. Volatile nature
- C. Ionic radius
- D. Oxidising power

Answer

81. The oxidation state of oxygen is zero in

- A. CO
- B. O_3
- C. SO_2
- D. H_2O_2

Answer

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A. kerosene oil

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B. diesel oil

C. gasoline

D. heavy oil

Answer

83. Coordination number of Fe in the complexes $[\text{Fe}(\text{CN})_6]^{4-}$, $[\text{Fe}(\text{CN})_6]^{3-}$ and $[\text{FeCl}_4]^-$ would be respectively

A. 6, 3, 4

B. 6, 6, 4

C. 2, 3, 3

D. 6, 4, 6

Answer

84. The activation energy for a simple chemical reaction $A \rightarrow B$ is E_a in forward direction. The activation energy for reverse reaction

A. is negative of E_a B. is always less than E_a C. can be less than or more than E_a D. is always double of E_a

Answer

85. When a biochemical reaction is carried out in laboratory from outside of human body in the absence of enzyme than rate of reaction obtained is 10^{-6} times, then activation energy of reaction in the presence of enzyme is

A. $6/RT$

B. P is required

C. different from E_a obtained in laboratory

D. cannot say anything

Answer

86. $[-\text{NH}(\text{CH}_2)_6\text{NHCO}(\text{CH}_2)_4\text{CO}-]_n$ is a

A. addition polymer

B. thermosetting polymer

C. homopolymer

D. copolymer

Answer

87. Isoprene is a valuable substance for making

A. propene

B. liquid fuel

C. synthetic rubber

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Answer

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88. Enzymes are made up of

- A. edible proteins
- B. proteins with specific structure
- C. nitrogen containing carbohydrates
- D. carbohydrates

Answer

89. Methoxy methane and ethanol are

- A. functional isomers
- B. chain isomers
- C. optical isomers
- D. geometrical isomers

Answer

90. Most stable ion is

- A. $\text{C}_6\text{H}_5\text{CH}_2^+$
- B. $(\text{CH}_3)_3\text{-C}^+$
- C. $(\text{CH}_3)_2\text{CH}^+$
- D. CH_3CH_2^+

Answer

91. Formation of 2-butene as major product by dehydration of 2-butanol is according to

- A. Markownikoff rule
- B. Saytzeff rule
- C. Peroxide effect
- D. Anti-Markownikoff rule

Answer

92. When phenol is distilled with Zn dust it gives

- A. benzaldehyde
- B. benzoic acid
- C. toluene
- D. benzene

Answer

93. Ethane is formed by the reaction of methyl iodide and sodium metal in dry ether solution. This reaction is known as

- A. Clemmensen's reduction
- B. Kolbe's reaction
- C. Wurtz reaction

D. Cannizaro's reaction

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94. The compound added to prevent chloroform to form phosgene gas (poisonous gas) is
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A. CH_3COOH

B. CH_3OH

C. CH_3COCH_3

D. $\text{C}_2\text{H}_5\text{OH}$

Answer

95. The reaction of benzaldehyde with alkali gives

A. phenol+ sodium benzoate

B. benzene + benzyl alcohol

C. benzyl alcohol + sodium benzoate

D. phenol+ benzene

Answer

96. The reaction $\text{C}_2\text{H}_5\text{ONa} + \text{BrC}_2\text{H}_5 \rightarrow \text{C}_2\text{H}_5\text{-O-C}_2\text{H}_5 + \text{NaBr}$ is called

A. Frankland reaction

B. Wurtz reaction

C. Williamson's synthesis

D. Cannizaro reaction

Answer

97. Diethyl ether on heating with conc. HI gives two moles of

A. ethyl iodide

B. ethanol

C. iodoform

D. methyl iodide

Answer

98. Positive Fehling test is shown by

A. acetaldehyde

B. acetone

C. benzaldehyde

D. acetophenone

Answer

99. $\text{RCONH}_2 + \text{Br}_2 + \text{KOH} \rightarrow \text{Amine}$

This reaction is

A. Carbyl amine reaction

B. Mustard oil reaction

C. Hofmann bromamide reaction

D. Cannizaro reaction

Answer

A. primary alcohol

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B. monocarboxylic acid

C. secondary alcohol

D. tertiary alcohol

[Answer](#)