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Previous Year Paper

Chemistry - 2010

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Multiple Choice Questions

1. The wave number of the spectral line in the emission spectrum of hydrogen will be equal to 89 times the rydberg's constant if the electron jumps from
- A. $n = 3$ to $n = 1$
 - B. $n = 10$ to $n = 1$
 - C. $n = 9$ to $n = 1$
 - D. $n = 2$ to $n = 1$

Answer

2. Consider the following gaseous equilibria with equilibrium constants K_1 and K_2 respectively.
- $$\text{SO}_2(\text{g}) + 12\text{O}_2(\text{g}) \rightleftharpoons \text{SO}_3(\text{g})$$
- $$2\text{SO}_3(\text{g}) \rightleftharpoons 2\text{SO}_2(\text{g}) + \text{O}_2(\text{g})$$
- The equilibrium constants are related as
- A. $K_1 = 12K_2$
 - B. $2K_1 = K_2$
 - C. $K_2 = 2K_1$
 - D. $K_2 = 12K_1$

Answer

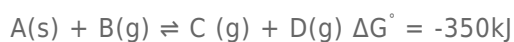
3. Enthalpy of vaporization of benzene is $+ 35.3 \text{ kJ mol}^{-1}$ at its boiling point, 80°C . The entropy change in the transition of the vapour to liquid at its boiling point in $[\text{JK}^{-1}\text{mol}^{-1}]$ is
- A. -441
 - B. -100
 - C. +441
 - D. +100

Answer

4. Which one of the following conversions involve change in both hybridisation and shape?
- A. $\text{CH}_4 \rightarrow \text{C}_2\text{H}_6$
 - B. $\text{NH}_3 \rightarrow \text{NH}_4^+$
 - C. $\text{BF}_3 \rightarrow \text{BF}_4^-$
 - D. $\text{H}_2\text{O} \rightarrow \text{H}_3\text{O}^+$

Answer

5. In the reversible reaction,



Which one of the following statements is true?

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A. The entropy change is negative

B. Equilibrium constant is greater than one

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C. The reaction should be instantaneous

D. The reaction is thermodynamically not feasible

Answer

6. The amount of heat evolved when 500 cm³ of 0.1 M HCl is mixed with 200 cm³ of 0.2 M NaOH is

A. 2.292 kJ

B. 1.292 kJ

C. 0.292 kJ

D. 3.392 kJ

Answer

7. During the adsorption of krypton on activated charcoal at low temperature.

A. $\Delta H > 0$ and $\Delta S < 0$ B. $\Delta H < 0$ and $\Delta S < 0$ C. $\Delta H > 0$ and $\Delta S > 0$ D. $\Delta H < 0$ and $\Delta S < 0$

Answer

8. The set of quantum numbers for the outermost electron for copper in its ground state is

A. 4, 1, 1 +1/2

B. 3, 2, 2, +1/2

C. 4, 0, 0, +1/2

D. 4, 2, 2, +1/2

Answer

9. Peroxide ion

(i) has five completely filled antibonding molecular orbitals

(ii) is diamagnetic

(iii) has bond order one

(iv) is isoelectronic with neon

Which one of these is correct?

A. (ii) and (iii)

B. (i), (ii) and (iv)

C. (i), (ii) and (iii)

D. (i) and (iv)

Answer

10. A mixture of CaCl₂ and NaCl weighing 4.44 g is treated with sodium carbonate solution to precipitate all the Ca²⁺ ions as calcium carbonate. The calcium carbonate so obtained is heated strongly to get 0.56 g of CaO. The percentage of NaCl in the mixture (atomic mass of Ca = 40) is

A. 75

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D. 69.4

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Answer

11. For one mole of an ideal gas, increasing the temperature from 10°C to 20°C
- A. increases the average kinetic energy by two times
 - B. increases the rms velocity by $\sqrt{2}$ times
 - C. increases the rms velocity by two times
 - D. increases both the average kinetic energy and rms velocity, but not significantly

Answer

12. Carbon can reduce ferric oxide to iron at a temperature above 983 K because
- A. carbon monoxide formed is thermodynamically less stable than ferric oxide
 - B. carbon has a higher affinity towards oxidation than iron
 - C. free energy change for the formation of carbon dioxide is less negative than that for ferric oxide
 - D. iron has a higher affinity towards oxygen than carbon

Answer

13. 50 cm³ of 0.2 NHCl is titrated against 0.1 N NaOH solution. The titration is discontinued after adding 50 cm³ of NaOH. The remaining titration is completed by adding 0.5 N KOH. The volume of KOH required for completing the titration is
- A. 12 cm³
 - B. 10 cm³
 - C. 25 cm³
 - D. 10.5 cm³

Answer

14. In which one of the following, does the given amount of chlorine exert the least pressure in a vessel of capacity 1 dm³ at 273 K?
- A. 0.0355g
 - B. 0.071g
 - C. 6.023×10^{21} molecules
 - D. 0.02 mol

Answer

15. Based on the first law of thermodynamics, which one of the following is correct?
- A. For an isochoric process = $\Delta E = -q$
 - B. For an adiabatic process = $\Delta E = -w$
 - C. For an isothermal process = $q = +w$
 - D. For a cyclic process $q = -w$

Answer

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16. 1 g of silver gets distributed between 10 cm^3 of molten zinc and 100 cm^3 of molten lead at 800°C . The percentage of silver in the zinc layer is approximately
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A. 89

B. 91

C. 97

D. 94

Answer

17. 0.023 g of sodium metal is reacted with 100 cm^3 of water. The pH of the result solution is

A. 10

B. 11

C. 9

D. 12

Answer

18. A buffer solution contains 0.1 mole of sodium acetate in 1000 cm^3 of 0.1 M acetic acid. To the above buffer solution, 0.1 mole of sodium acetate is further added and dissolved. The pH of the resulting buffer is equal to

A. $\text{pK}_a - \log 2$

B. pK_a

C. $\text{pK}_a + 2$

D. $\text{pK}_a + \log 2$

Answer

19. The empirical formula of a non-electrolyte is CH_2O . A solution containing 6 g of the compound exerts the same osmotic pressure as that of 0.05 M glucose solution at the same temperature. The molecular formula of

A. $\text{C}_2\text{H}_4\text{O}_2$

B. $\text{C}_3\text{H}_6\text{O}_3$

C. $\text{C}_5\text{H}_{10}\text{O}_5$

D. $\text{C}_4\text{H}_8\text{O}_4$

Answer

20. 1 dm^3 solution containing 10^{-5} moles each of Cl^- ions and CrO_4^{2-} ions is treated with 10^{-4} moles of silver nitrate. Which one of the following observations is made?

$[\text{K}_{\text{sp}}\text{Ag}_2\text{CrO}_4 = 4 \times 10^{-12}]$ and $[\text{K}_{\text{sp}}\text{AgCl} = 1 \times 10^{-10}]$

A. Precipitation does not occur

B. Silver chromate gets precipitated first

C. Silver chloride gets precipitated first

D. Both silver chromate and silver chloride start precipitating simultaneously

Answer

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A. 0.1 M HNO_3

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B. 0.05 M H_2SO_4 C. 0.1 M CH_3COOH D. 50 cm^3 of 0.4 M HCl + 50 cm^3 of 0.2 M NaOH

Answer

22. Which one of these is not true for benzene?

A. It forms only one type of monosubstituted product

B. There are three carbon-carbon single bonds and three carbon-carbon double bonds

C. The heat of hydrogenation of benzene is less than the theoretical value

D. The bond angle between the carbon-carbon bonds is 120°

Answer

23. Generally, the first ionization energy increases along a period. But there are some exceptions.

One which is not an exception is

A. N and O

B. Na and Mg

C. Mg and Al

D. Be and B

Answer

24. Which one of the following conformations of cyclohexane is the least stable?

A. Half-chair

B. Boat

C. Twisted-boat

D. Chair

Answer

25. Which one of the following is a molecular crystal?

A. Rock salt

B. Quartz

C. Dry ice

D. Diamond

Answer

26. Chloroacetic acid is a stronger acid than acetic acid. This can be explained using

A. -M effect

B. -I effect

C. +M effect

D. +I effect

Answer

27. For alkali metals, which one of the following trends is incorrect?

A. Hydration energy : $\text{Li} > \text{Na} > \text{K} > \text{Rb}$ Like. Share. Bookmark. Download. Make Notes. Print - Your Favourite Questions. Join www.zigya.com

Answer

28. A dibromo derivative of an alkane reacts with sodium metal to form an alicyclic hydrocarbon. The derivative is

- A. 1, 1-dibromopropane
- B. 2, 2-dibromobutane
- C. 1, 2-dibromoethane
- D. 1, 4-dibromobutane

Answer

29. In the electrolytic refining of zinc

- A. graphite is at the anode
- B. the impure metal is at the cathode
- C. the metal ion get reduced at the anode
- D. acidified zinc sulphate is the electrolyte

Answer

30. In chromite ore, the oxidation number of iron, and chromium are respectively

- A. +3,+2
- B. +3,+6
- C. +2,+6
- D. +2,+3

Answer

31. Which one of the following does not involve coagulation?

- A. Formation of delta regions
- B. Peptization
- C. Treatment of drinking water by potash alum
- D. Clotting of blood by the use of ferric chloride

Answer

32. Which one of the following statements is true?

- A. Saponification of oil yields a diol
- B. Drying of oil involves hydrolysis
- C. Addition of antioxidant to oil minimizes rancidity
- D. Refining of oil involves hydrogenation

Answer

33. The IUPAC name of $\text{K}_2[\text{Ni}(\text{CN})_4]$ is

- A. potassium tetracyanonickelate (II)
- B. potassium tetracyanatonickelate (III)
- C. potassium tetracyanatonickel (II)

Answer

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34. The spin only magnetic moment of Mn^{4+} ion is nearly

- A. 3BM
- B. 6BM
- C. 4BM
- D. 5BM

Answer

35. In Kjeldahl's method, ammonia from 5 g of food neutralizes 30 cm^3 of 0.1 N acid. The percentage of nitrogen in the food is

- A. 0.84
- B. 8.4
- C. 16.8
- D. 1.68

Answer

36. The activation energy for a reaction at the temperature T K was found to be $2.303 RT \text{ J mol}^{-1}$. The ratio of the rate constant to Arrhenius factor is

- A. 10^{-1}
- B. 10^{-2}
- C. 2×10^{-3}
- D. 2×10^{-2}

Answer

37. Time required for 100 per cent completion of a zero order reaction is

- A. $2k/a$
- B. $a/2k$
- C. a/k
- D. ak

Answer

38. Which one of the following is wrongly matched?

- A. $[Cu(NH_3)_4]^{2+}$ - Square planar
- B. $[Ni(CO)_4]$ - Neutral ligand
- C. $[Fe(CN_6)^{3-}]$ - sp^3d^2
- D. $[Co(en)_3]^{3+}$ - Follows EAN

Answer

39. 9.65 C of electric current is passed through fused anhydrous magnesium chloride. The magnesium metal thus, obtained is completely converted into a Grignard reagent. The number

of moles of the Grignard reagent obtained is

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C. 5×10^{-5}

D. 1×10^{-5}

Answer

40. The standard emf of galvanic cell involving 3 moles of electrons in its redox reaction is 0.59 V. The equilibrium constant for the reaction of the cell is

A. 10^{25}

B. 10^{20}

C. 10^{15}

D. 10^{30}

Answer

41. The following data is obtained during the first order thermal decomposition of $2A(g) \rightarrow B(g) + C(s)$ at constant volume and temperature.

S.No	Time	Total pressure in Pascal
1.	At the end of 10 min	300
2.	After completion	200

The rate constant in min^{-1}

A. 0.0693

B. 6.93

C. 0.00693

D. 69.3

Answer

42. Which one of the following is an example for homogeneous catalysis?

A. Manufacture of sulphuric acid by Contact process

B. Manufacture of ammonia by Haber's process

C. Hydrolysis of sucrose in presence of dilute hydrochloric acid

D. Hydrogenation of oil

Answer

43. A white crystalline salt A reacts with dilute HCl to liberate a suffocating gas B and also forms a yellow precipitate. The gas B turns potassium dichromate acidified with dilute H_2SO_4 to a green coloured solution C. A, B, C are respectively

A. Na_2SO_3 , SO_2 , $\text{Cr}_2(\text{SO}_4)_3$

B. $\text{Na}_2\text{S}_2\text{O}_3$, SO_2 , $\text{Cr}_2(\text{SO}_4)_3$

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Answer

44. Molecules of a noble gas do not possess vibrational energy because a noble gas

- A. is monoatomic
- B. is chemically inert
- C. has completely filled shells
- D. is diamagnetic

Answer

45. E_1 , E_2 , E_3 are the emf values of the three galvanic cells respectively.

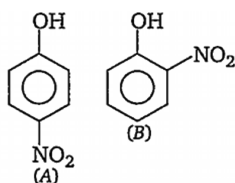
(i) $\text{Zn} | \text{Zn}^{2+} || \text{Cu}^{2+} | \text{Cu}$ (ii) $\text{Zn} | \text{Zn}^{2+} || \text{Cu}^{2+} | \text{Cu}$ (iii) $\text{Zn} | \text{Zn}^{2+} || \text{Cu}^{2+} | \text{Cu}$

Which one of the following is true?

- A. $E_1 > E_2 > E_3$
- B. $E_2 > E_3 > E_1$
- C. $E_3 > E_2 > E_1$
- D. $E_1 > E_3 > E_2$

Answer

46. Out of the compounds below the vapour pressure of (B) at a particular temperature is



- A. higher than that of (A)
- B. lower than that of (A)
- C. higher or lower than (A), depending on the size of the vessel
- D. same as that of (A)

Answer

47. An oxygen containing organic compound upon oxidation forms a carboxylic acid as the only organic product with its molecular mass higher by 14 units. The organic compound is

- A. an aldehyde
- B. a primary alcohol
- C. a secondary alcohol
- D. a ketone

Answer

48. The compound obtained when acetaldehyde reacts with dilute aqueous sodium hydroxide exhibits

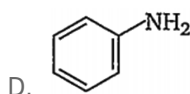
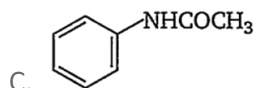
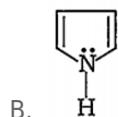
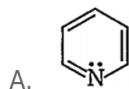
- A. geometrical isomerism

D. both optical and geometrical isomerism

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Answer

49. Which one of the following has the most nucleophilic nitrogen?



Answer

50. The correct sequence of reactions to convert p-nitrophenol into quinol involves

- reduction, diazotization and hydrolysis
- hydrolysis, diazotization and reduction
- hydrolysis, reduction and diazotization
- diazotization, reduction and hydrolysis

Answer

51. The letter 'D' in D-glucose signifies

- configuration at all chiral carbons
- dextrorotatory
- that it is a monosaccharide
- configuration at a particular chiral carbon

Answer

52. Reaction of methyl bromide with aqueous sodium hydroxide involves

- racemisation
- S_N1 mechanism
- retention of configuration
- S_N2 mechanism

Answer

53. In alkaline medium, alanine exists predominantly as

- anion
- Zwitter ion
- cation
- Covalent form

Answer

54. Benzaldehyde and acetone can be best distinguished using

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B. Sodium hydroxide solution

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C. 2, 4-DNP

D. Tollen's reagent

Answer

55. Phenol $\rightarrow$ X forms a tribromo derivative, 'X' is

A. bromine in benzene

B. bromine in water

C. potassium bromide solution

D. bromine in carbon tetrachloride at 0°C

Answer

56. One mole of an organic compound A with the formula $\text{C}_3\text{H}_8\text{O}$ reacts completely With two moles of HI to form X and Y. When Y is boiled with aqueous alkali it forms Z. Z answers the iodoform test.

The compound A is

A. propan-2-ol

B. propan-1-ol

C. ethoxyethane

D. methoxyethane

Answer

57. $\text{CH}_3\text{CH}_2\text{Br} \rightarrow \Delta \text{aq KOH} \text{CH}_3\text{CH}_2\text{OH} \rightarrow \Delta \text{KMnO}_4/\text{H}^+ + \text{B} \rightarrow \Delta \text{NH}_3 \text{C} \rightarrow \text{alkaliBr}_2 \text{D}$, 'D' is

A. CH_2Br

B. CH_3CONH_2

C. CH_3NH_2

D. CHBr_3

Answer

58. The correct sequence of steps involved in the mechanism of Cannizzaro's reaction is

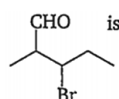
A. nucleophilic attack, transfer of H^- and transfer of H^+

B. transfer of H^- , transfer of H^+ and nucleophilic attack

C. transfer of H^+ , nucleophilic attack and transfer of H^-

D. electrophilic attack by OH^- , transfer of H^+ and transfer of H^-

Answer



59. The IUPAC name of

A. 2-methyl-3-bromohexanal

B. 3-bromo-2-methylbutanal

C. 2-methyl-3-bromobutanal

D. 3-bromo-2-methylpentanal

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60. Which one of the following forms propane nitrile as the major product?

A. Ethyl bromide + alcoholic KCN

B. Propyl bromide + alcoholic KCN

C. Propyl bromide + alcoholic AgCN

D. Ethyl bromide + alcoholic AgCN

[Answer](#)