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Previous Year Paper

Chemistry - 2011

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Multiple Choice Questions

1. Arrange the following in the order of increasing mass (atomic mass O = 16, Cu = 63, N = 14)

- I. One atom of oxygen
- II. One atom of nitrogen
- III. 1×10^{-10} mole of oxygen
- IV. 1×10^{-10} mole of copper

- A. II < I < III < IV
- B. I < II < III < IV
- C. III < II < IV < I
- D. II < IV < I < III

Answer

2. Which transition in the hydrogen atomic spectrum will have the same wavelength as the transition will have the same wavelength, $n = 4$ to $n = 2$ of He^+ spectrum?

- A. $n = 4$ to $n = 3$
- B. $n = 2$ to $n = 1$
- C. $n = 4$ to $n = 2$
- D. $n = 3$ to $n = 1$

Answer

3. Which of the following is not correct with respect to bond length of the species?

- A. $\text{C}_2 > \text{C}_2^{2-}$
- B. $\text{B}_2^+ > \text{B}_2$
- C. $\text{Li}_2^+ > \text{Li}_2$
- D. $\text{O}_2 > \text{O}_2^-$

Answer

4. Intramolecular hydrogen bond is present in

- A. water
- B. *o*-nitrophenol
- C. *p*-nitrophenol
- D. methylamine

Answer

5. A mixture of ethane and ethene occupies 41 L at 1 atm and 500 K. The mixture reacts completely with 103 mole of O_2 to produce CO_2 and H_2O . The mole fraction of ethane and ethene

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A. 0.50, 0.50

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B. 0.75, 0.25

C. 0.67, 0.33

D. 0.25, 0.75

Answer

6. Substance which is weakly repelled by a magnetic field is

A. O_2 B. H_2O C. CrO_2 D. Fe_3O_4

Answer

7. The correct decreasing order of first ionisation enthalpies of five elements of the second period is

A. $\text{Be} > \text{B} > \text{C} > \text{N} > \text{F}$ B. $\text{N} > \text{F} > \text{C} > \text{B} > \text{Be}$ C. $\text{F} > \text{N} > \text{C} > \text{Be} > \text{B}$ D. $\text{N} > \text{F} > \text{B} > \text{C} > \text{Be}$

Answer

8. In the reaction $\text{H}_2\text{S} + \text{H}_2\text{O}_2 \rightarrow \text{S} + 2\text{H}_2\text{O}$ A. H_2S is an acid and H_2O_2 is a baseB. H_2S is a base and H_2O_2 is an acidC. H_2S is an oxidising agent and H_2O_2 is a reducing agentD. H_2S is a reducing agent and H_2O_2 is an oxidising agent

Answer

9. The bonds present in the structure of dichromate ion are

A. four equivalent Cr-O bonds only

B. six equivalent Cr-O bonds and one Cr - O - O bond

C. six equivalent Cr-O bonds and one O-O bond

D. eight equivalent Cr-O bonds

Answer

10. Molar heat capacity of aluminium is $25 \text{ JK}^{-1} \text{ mol}^{-1}$. The heat necessary to raise the temperature of 54 g of aluminium (atomic mass 27 g mol^{-1}) from 30°C to 50°C is

A. 1.5 kJ

B. 0.5 kJ

C. 1.0 kJ

D. 2.5 kJ

Answer

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Compounds	K_{sp}
AgCl	1.1×10^{-10}
AgI	1.0×10^{-16}
PbCrO ₄	4.0×10^{-14}
Ag ₂ CO ₃	8.0×10^{-12}

The most soluble and least soluble compounds are

- A. AgCl and PbCrO₄
- B. AgI and Ag₂CO₃
- C. AgCl and Ag₂CO₃
- D. Ag₂CO₃ and AgI

Answer

12. Four moles of PCl₅ are heated in a closed 4 dm³ container to reach equilibrium at 400 K. At equilibrium 50% of PCl₅ is dissociated. What is the value of K_c for the dissociation of PCl₅ into PCl₃ and Cl₂ at 400 K?

- A. 0.50
- B. 1.00
- C. 1.25
- D. 0.05

Answer

13. At 25°C, at 5% aqueous solution of glucose (molecular weight = 180g mol⁻¹) is isotonic with a 2% aqueous solution containing an unknown solute. What is the molecular weight of the unknown solute?

- A. 60
- B. 80
- C. 72
- D. 63

Answer

14. A weak monobasic acid is 1% ionized in 0.1 M solution at 25°C. The percentage of ionisation in its 0.025 M solution is

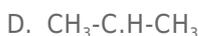
- A. 1
- B. 2
- C. 3

D. 4

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15. The most stable radical among the following is

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Answer

16. Be and Al exhibit diagonal relationship. Which of the following statements about them is/ are not true?

I. Both react with HCl to liberate H_2

II. They are made passive by HNO_3

III. Their carbides give acetylene on treatment with water

IV. Their oxides are amphoteric

A. III only

B. III and IV

C. I and III

D. I only

Answer

17. Which one of the following on hydrolysis, gives the corresponding metallic hydroxide, H_2O_2 and O_2 ?



Answer

18. A solution containing 1.8 g of a compound (empirical formula CH_2O) in 40 g of water is observed to freeze at -0.465°C . The molecular formula of the compound is (k_f of water = 1.86 K mol^{-1})



Answer

19. In the disproportionation reaction,



the equivalent mass of the oxidising agent is (molar mass of $\text{HClO}_3 = 84.45$)

A. 16.89

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C. 84.45

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D. 28.15

Answer

20. The IUPAC name of the compound $\text{CH}_3\text{-CH}(\text{CH}_3)\text{CO-CH}_3$ is

- A. 3-methyl 2-butanone
- B. 2-methyl 3-butanone
- C. isopropyl methyl ketone
- D. methyl isopropyl ketone

Answer

21. Two organic compounds X and Y on analysis gave the same percentage composition namely; C = $(12/13) \times 100\%$ and H = $(1/13) \times 100\%$. However, compound X decolourises bromine water while compound Y does not. The two compounds X and Y may be respectively

- A. acetylene and ethylene
- B. acetylene and benzene
- C. ethylene and benzene
- D. toluene and benzene

Answer

22. For preparing an alkane, a saturated solution of sodium or potassium salt of a carboxylic acid is subjected to

- A. hydrolysis
- B. electrolysis
- C. oxidation
- D. hydrogenation

Answer

23. Among the following pairs, the pair that illustrates stereoisomerism is

- A. 1-butanol and 2-butanol
- B. *cis* - 2-butene and *trans* - 2-butene
- C. dimethyl ether and ethanol
- D. acetone and propanal

Answer

24. The compound CHCl=CHCHOHCOOH with molecular formula $\text{C}_4\text{H}_5\text{O}_3\text{Cl}$ can exhibit

- A. geometric, optical, position and functional isomerism
- B. geometric, optical and functional isomerism
- C. position and functional isomerism only
- D. geometric and optical isomerism only

Answer

25. The temporary effect in which there is complete transfer of a shared pair of pi-electrons to one

of the atoms joined by a multiple bond on the demand of an attacking reagent is called Like. Share. Bookmark. Download. Make Notes. Print - Your Favourite Questions. Join www.zigya.com

B. inductive effect

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C. positive resonance effect

D. negative resonance effect

Answer

26. The least stable hydride of 15th group elements is

A. BiH_3

B. NH_3

C. AsH_3

D. SbH_3

Answer

27. Which one of the following oxides of nitrogen dimerises into colourless is solid/ liquid on cooling?

A. N_2O

B. NO

C. N_2O_3

D. NO_2

Answer

28. Consider the following statements.

I. $\text{La}(\text{OH})_3$ is the least basic among hydroxides of lanthanides.

II. Zr^{4+} and Hf^{4+} possess almost the same ionic radii.

III. Ce^{4+} can act as an oxidising agent.

Which of the above is/are true?

A. I and III

B. II and III

C. II only

D. I and II

Answer

29. The rate of the reaction $\text{A} \rightarrow \text{products}$, at the initial concentration of $3.24 \times 10^{-2} \text{ M}$ is nine times its rate at another initial concentration of $1.2 \times 10^{-3} \text{ M}$. The order of the reaction is

A. 12

B. 34

C. 32

D. 23

Answer

30. Associated colloid among the following is

A. sodium stearate

B. enzymes

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D. cellulose

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Answer

31. The correct statement with respect to the complexes $[\text{Ni}(\text{CO})_4]$ and $[\text{Ni}(\text{CN})_4]^{2-}$ is
- A. nickel is in the same oxidation state in both
 - B. both have tetrahedral geometry
 - C. both have square planar geometry
 - D. have tetrahedral and square planar geometry respectively

Answer

32. Consider the following statements in respect of zero order reaction.
- I. The rate of the reaction is independent of reactant concentration.
 - II. The rate of the reaction is independent of temperature.
 - III. The rate constant of the reaction is independent of temperature.
 - IV. The rate constant of the reaction is independent of reactant concentration.

Choose the correct statement/s

- A. I only
- B. I and II only
- C. I and IV only
- D. I and III only

Answer

33. The complex ion which has the highest magnetic moment among the following is
- A. $[\text{CoF}_6]^{3-}$
 - B. $[\text{Co}(\text{NH}_3)_6]^{3+}$
 - C. $[\text{Ni}(\text{NH}_3)_4]^{2+}$
 - D. $[\text{Ni}(\text{CN})_4]^{2-}$

Answer

34. The standard redox potential for the reactions, $\text{Mn}^{2+} + 2\text{e}^- \rightarrow \text{Mn}$ and $\text{Mn}^{3+} + \text{e}^- \rightarrow \text{Mn}^{2+}$ are -1.18 V and 1.51 V respectively. What is the redox potential for the reaction $\text{Mn}^{3+} + 3\text{e}^- \rightarrow \text{Mn}$?
- A. 0.33 V
 - B. 1.69 V
 - C. - 0.28 V
 - D. -0.85 V

Answer

35. The limiting molar conductivities of HCl, CH_3COONa and NaCl are respectively 425, 90 and 125 $\text{mho cm}^2 \text{mol}^{-1}$ at 25°C . The molar conductivity of 0.1 M CH_3COOH solution is $7.8 \text{ mho cm}^2 \text{mol}^{-1}$

at the same temperature. The degree of dissociation of 0.1 M acetic acid solution at the same temperature is

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A. 0.10

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B. 0.02

C. 0.15

D. 0.03

Answer

36. When 0.01 mole of a cobalt complex is treated with excess silver nitrate solution, 4.305 g of silver chloride is precipitated. The formula of the complex is

A. $[\text{Co}(\text{NH}_3)_3\text{Cl}_3]$ B. $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$ C. $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$ D. $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]\text{NO}$

Answer

37. The correct order of boiling points of 2, 2-dimethylpropane, 2-methylbutane and *n*-pentane is

A. *n*-pentane > 2, 2-dimethylpropane > 2-methylbutaneB. *n*-pentane > 2-methylbutane > 2, 2-dimethylpropaneC. 2, 2-dimethylpropane > 2-methylbutane > *n*-pentaneD. 2-methylbutane > 2, 2-dimethylpropane > *n*-pentane

Answer

38. Which of the following is the correct method of preparation of methyl fluoride?

A. $\text{CH}_4 + \text{HF} \rightarrow$ B. $\text{CH}_3\text{OH} + \text{HF} \rightarrow$ C. $\text{CH}_4 + \text{F}_2 \rightarrow$ D. $\text{CH}_3\text{Br} + \text{AgF} \rightarrow$

Answer

39. Phenol can be converted to *o*-hydroxybenzaldehyde by

A. Kolbe's reaction

B. Reimer-Tiemann reaction

C. Wurtz reaction

D. Cannizaro reaction

Answer

40. *n*-butylamine (I), diethylamine (II) and *N,N*-dimethylethylamine (III) have the same molar mass. The increasing order of their boiling point is

A. III < II < I

B. I < II < III

C. II < III < I

D. II < I < III

Answer

41. Choose the incorrect statement. Make Notes. Print - Your Favourite Questions. Join www.zigya.com

B. *Tert*-butylamine is a primary amine

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C. Tertiary amines do not show intermolecular hydrogen bonds

D. Isopropylamine is a secondary amine

Answer

42. The monomers used for their preparation of nylon 2-nylon 6 is/are

A. caprolactam

B. alanine and amino caproic acid

C. glycine and amino caproic acid

D. hexamethylenediamine and adipic acid

Answer

43. Zeigler-Natta catalyst is used in the preparation of

A. low density polythene

B. high density polythene

C. dacron

D. teflon

Answer

44. The cationic detergent that is used in hair conditioners is

A. cetyltrimethyl ammonium bromide

B. sodium dodecylbenzene sulphonate

C. sodium lauryl sulphate

D. tetramethyl ammonium chloride

Answer

45. Salts of sorbic acid and propionic acid are used as

A. antioxidants

B. flavouring agents

C. food preservatives

D. nutritional supplements

Answer

46. When 3-phenylpropene reacts with HBr in the presence of peroxide, the major product formed is

A. 2-bromo 1-phenylpropane

B. 1, 2-dibromo 3-phenylpropane

C. 3-(*o*-bromophenyl) propene

D. 1-bromo 3-phenylpropane

Answer

47. Reaction of butanone with methylmagnesium bromide following by hydrolysis gives

A. 2-methyl-2-butanol

B. 2-butanol

C. 3-methyl-2-butanol

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48. The hydroxyl compound that gives a precipitate immediately when treated with concentrated hydrochloric acid and anhydrous zinc chloride is

- A. 3-methyl-2-butanol
- B. 3-methyl-1-butanol
- C. 1-butanol
- D. 2-methyl-2-butanol

Answer