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Previous Year Paper

Chemistry - 2016



Multiple Choice Questions

1. The number of oxygen atoms in 4.4gm of CO_2 is

- A. 1.2×10^{23}
- B. 6×10^{22}
- C. 6×10^{23}
- D. 12×10^{23}

Answer

2. If the bond energies of H-H, Br-Br and H-Br are 433, 192 and 364 kJ mol^{-1} respectively, then ΔH° for the reaction-



- A. -261 kJ
- B. +103 kJ
- C. +261 kJ
- D. -103 kJ

Answer

3. In the reaction,

$\text{Fe}(\text{OH})_3(\text{s}) \rightleftharpoons \text{Fe}^{3+}(\text{aq}) + 3\text{OH}^{-}(\text{aq})$, if the concentration of OH^{-} ions is decreased by 14 times, then the equilibrium concentration of Fe^{3+} will increase by

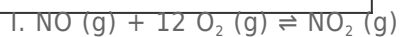
- A. 8 times
- B. 16 times
- C. 64 times
- D. 4 times

Answer

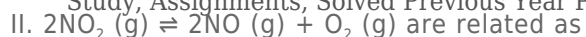
4. The correct statement regarding entropy is

- A. at absolute zero temperature, entropy of a perfectly crystalline solid is zero
- B. at absolute zero temperature, the entropy of a perfectly crystalline substance is positive
- C. at absolute zero temperature, the entropy of all crystalline substances is zero
- D. at 0°C , the entropy of a perfect crystalline solid is zero

Answer



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- A. $K_1 = K_2$
- B. $K_2 = 1/K_1$
- C. $K_1 = 2K_2$
- D. $K_2 = 1/K_1^2$

Answer

6. The shape of XeF_6 is

- A. square planar
- B. distorted octahedral
- C. square pyramidal
- D. pyramidal

Answer

7. CO is a stronger ligand than Cl^- , because

- A. CO is a neutral molecule
- B. CO has π -bonds
- C. CO is poisonous
- D. CO is more reactive

Answer

8. Which of the following sequence is correct regarding field strength of ligands as per spectrochemical series?

- A. $\text{SCN}^- < \text{F}^- < \text{CN}^- < \text{CO}$
- B. $\text{F}^- < \text{SCN}^- < \text{CN}^- < \text{CO}$
- C. $\text{CN}^- < \text{F}^- < \text{CO} < \text{SCN}^-$
- D. $\text{SCN}^- < \text{CO} < \text{F}^- < \text{CN}^-$

Answer

9. A liquid can exist only

- A. between triple and critical points
- B. at any temperature above melting point
- C. between melting and critical points
- D. between boiling and melting points

Answer

10. The energy of electron in the n^{th} Bohr orbit of H-atom is

- A. $-13.6n^2 \text{ eV}$
- B. $-13.6n \text{ eV}$
- C. $-13.6/n \text{ eV}$

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Answer

11. Consider the following sets of quantum numbers. Which of the following setting is not permissible arrangement of electrons in an atom?

A. $n = 4; l = 0; m = 0; s = -12$
B. $n = 5; l = 3; m = 0; s = +12$
C. $n = 3; l = 2; m = -2; s = -12$
D. $n = 3; l = 2; m = -3; s = +12$

Answer

12. The increasing order of bond order of O_2 , O_2^+ , O_2^- and O_2^{2-} is

A. $O_2^+ < O_2 < O_2^- < O_2^{2-}$
B. $O_2^{2-} < O_2^- < O_2^+ < O_2$
C. $O_2 < O_2^+ < O_2^- < O_2^{2-}$
D. $O_2^{2-} < O_2^- < O_2 < O_2^+$

Answer

13. HCl gas is covalent and NaCl is an ionic compound. This is because

A. sodium is highly electropositive
B. hydrogen is a non-metal
C. HCl is a gas
D. electronegativity difference between H and Cl is less than 2.1

Answer

14. Main axis of diatomic molecule is z. The orbitals p_x and p_y overlap to form

A. π -molecular orbital
B. σ -molecular orbital
C. δ -molecular orbital
D. No bond is formed

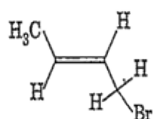
Answer

15. An organic compound contains C = 40%, H = 13.33% and N = 46.67%. Its empirical formula is

A. C_2H_2N
B. C_3H_7N
C. CH_4N
D. CHN

Answer

16. IUPAC name of the compound,



A. 1-bromobut-2-ene

B. 2-bromo-2-butene

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D. 1-bromobut-3-ene

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Answer

17. Benzene carbaldehyde is reacted with conc. NaOH solution to give the products A and B. The product A can be used as a food preservative and the product B is an aromatic hydroxy compound, where -OH group is linked to sp^3 -hybridised C-atom next to benzene ring. The products A and B respectively are

- A. sodium benzoate and phenol
- B. sodium benzoate and phenyl methanol
- C. sodium benzoate and cresol
- D. sodium benzoate and picric acid

Answer

18. An organic compound A on reduction gives compound B, which on reaction with trichloromethane and caustic potash forms C. The compound C on catalytic reduction gives N-methyl benzenamine, the compound A is,

- A. nitrobenzene
- B. nitromethane
- C. methanamine
- D. benzenamine

Answer

19. Which of the following gives positive Fehling's solution test?

- A. Sucrose
- B. Glucose
- C. Fats
- D. Protein

Answer

20. The hybridisation of C in diamond, graphite and ethyne is in the order.

- A. sp^3 , sp , sp^2
- B. sp^3 , sp^2 , sp
- C. sp , sp^2 , sp^3
- D. sp^2 , sp^3 , sp

Answer

21. A miscible mixture of $C_6H_6 + CHCl_3$ can be separated by

- A. sublimation
- B. distillation
- C. filtration
- D. crystallisation

Answer

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A. NO^+

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B. NO_2^+

C. NO

D. NO_3^-

Answer

23. The half-life period of a first order reaction is 60 min. What percentage will be left over after 240 min?

A. 6.25%

B. 4.25%

C. 5%

D. 6%

Answer

24. Which of the following is not a colligative property?

A. Osmotic pressure

B. Optical activity

C. Depression in freezing point

D. Elevation in boiling point

Answer

25. The contribution of particle at the edge centre to a particular unit cell is

A. 12

B. 14

C. 1

D. 18

Answer

26. When an electrolyte is dissociated in solution, the van't Hoff factor (i) is

A. > 1 B. < 1 C. $= 0$ D. $= 1$

Answer

27. Which of the following is incorrect in a galvanic cell?

A. Oxidation occurs at anode

B. Reduction occurs at cathode

C. The electrode at which electrons are gained is called cathode

D. The electrode at which electrons are lost is called cathode

Answer

28. A secondary cell is one

A. can be recharged

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C. can be recharged by passing current through it in the opposite direction

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D. cannot be recharged

Answer

29. Osmotic pressure of the solution can be increased by,

- A. increasing the temperature of the solution
- B. decreasing the temperature of the solution
- C. increasing the volume of the vessel
- D. diluting the solution

Answer30. The amount of current in Faraday, is required for the reduction of 1 mole of $\text{Cr}_2\text{O}_7^{2-}$ ions to Cr^{3+} is

- A. 1 F
- B. 2 F
- C. 6 F
- D. 4 F

Answer31. For a chemical reaction, $m\text{A} \rightarrow x\text{B}$, the rate law is $r = k[\text{A}]^2$. If the concentration of A is doubled, the reaction rate will be

- A. doubled
- B. quadrupled
- C. increases by 8 times
- D. unchanged

Answer

32. Schottky defect in a crystal is observed, when

- A. unequal number of cations and anions are missing from the lattice
- B. equal number of cations and anions are missing from the lattice
- C. an ion leaves its normal site and occupies an interstitial site
- D. no ion is missing from its lattice site

Answer33. For $3\text{A} \rightarrow 2\text{B}$, rate of reaction, $+d[\text{B}]/dt$ is equal to

- A. $-3/2d[\text{A}]/dt$
- B. $-2/3d[\text{A}]/dt$
- C. $+2d[\text{A}]/dt$
- D. $-1/3d[\text{A}]/dt$

Answer

34. The activation energy of a chemical reaction can be determined by,

- A. evaluating rate constants at two different temperatures

- B. changing the concentration of reactants

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D. evaluating rate constant at standard temperature

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35. Which of the following statements is incorrect with respect to physisorption?

- A. The forces involved are van der Waals' forces
- B. More easily liquefiable gases are adsorbed easily
- C. Under high pressure it results into multimolecular layer on adsorbent surface
- D. $\Delta H_{\text{adsorption}}$ is low and positive

Answer

36. Sulphur sol contains

- A. discrete S-atoms
- B. discrete S molecules
- C. large aggregates of S molecules
- D. water dispersed in solid sulphur

Answer

37. Reactions in zeolite catalyst depend on

- A. pores
- B. apertures
- C. size of cavity
- D. All of the above

Answer

38. van-Arkel method of refining zirconium involves

- A. removing all oxygen and nitrogen impurities
- B. removing CO impurity
- C. removing hydrogen impurity
- D. removing silica impurity

Answer

39. The composition of "copper matte" is

- A. $\text{Cu}_2\text{S} + \text{FeS}$
- B. $\text{Cu}_2\text{S} + \text{Cu}_2\text{O}$
- C. $\text{Cu}_2\text{S} + \text{FeO}$
- D. $\text{Cu}_2\text{O} + \text{FeS}$

Answer

40. The complex formed when Al_2O_3 is leached from bauxite using conc. NaOH solution is,

- A. $\text{Na}[\text{Al}(\text{OH})_4]$
- B. NaAl_2O_4
- C. $\text{Na}[\text{Al}(\text{OH})_3]$
- D. Na_2AlO_2

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A. most of its reactions are exothermic

B. It forms only one oxo acid

C. highest electronegativity

D. high F-F bond dissociation enthalpy

Answer

42. Which is true regarding nitrogen?

A. Less electronegative

B. Has low ionisation enthalpy

C. *d*-orbitals are availableD. Ability to form π - π bonds with itself

Answer

43. The number of isomers possible for the octahedral complex $[\text{CoCl}_2(\text{en})(\text{NH}_3)_2]^+$ is

A. two

B. three

C. no isomer

D. four isomers

Answer

44. The bivalent metal ion having maximum paramagnetic behaviour among the first transition series elements is

A. Mn^{2+} B. Cu^{2+} C. Sc^{2+} D. Cu^+

Answer

45. When a brown compound of Mn (A) is treated with HCl, it gives a gas (B). The gas (B) taken in excess reacts with NH_3 to give; an explosive compound (C). The compounds A, B and C respectively areA. A - MnO_2 ; B - Cl_2 ; C - NCl_3 B. A - MnO ; B - Cl_2 ; C - NH_4Cl C. A - Mn_3O_4 ; B - Cl_2 ; C - NCl_3 D. A - MnO_3 ; B - Cl_2 ; C - NCl_2

Answer

46. Mn^{2+} compounds are more stable than Fe^{2+} compounds towards oxidation to their +3 state, becauseA. Mn^{2+} is more stable with high 3rd ionisation energyB. Mn^{2+} is bigger in sizeLike. Share. Bookmark. Download. Make Notes. Print - Your Favourite Questions. Join www.zigya.com

D. Mn²⁺ does not exist

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Answer

47. As per IUPAC norms, the name of the complex [Co(en)₂(ONO)Cl]Cl is

- A. chlorido bis (ethane-1, 2-diamine) nitro-O-cobalt (III) chloride
- B. chlorido bis (ethylenediamine) nitro-O-cobalt (III) chloride
- C. chlorido di (ethylenediamine) nitrocobalt (III) chloride
- D. chloro ethylenediaminenitr-O-cobalt (III) chloride

Answer

48. Reactivity order of halides for dehydrohalogenation is

- A. R - F > R - Cl > R - Br > R - I
- B. R - I > R - Br > R - Cl > R - F
- C. R - I > R - Cl > R - Br > R - F
- D. R - F > R - I > R - Br > R - Cl

Answer

49. Replacement of Cl of chlorobenzene to give phenol requires drastic conditions, but Cl of 2, 4-dinitrochlorobenzene is readily replaced. This is because

- A. -NO₂ group makes the ring electron rich at *ortho* and *para*-positions
- B. -NO₂ group withdraws electrons from *meta*-position
- C. -NO₂ donates electrons at *meta*-position
- D. -NO₂ withdraws electrons from *ortho* and *para*-positions

Answer

50. In the reaction,

Ethanol $\xrightarrow{\text{PCl}_5}$ X $\xrightarrow{\text{alc. KOH}}$ Y $\xrightarrow{\text{H}_2\text{O}, \Delta, \text{H}_2\text{SO}_4, \text{room temp}}$ Z

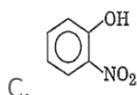
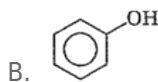
The product Z is

- A. C₂H₄
- B. CH₃CH₂OCH₂CH₃
- C. CH₃CH₂OSO₃H
- D. 

Answer

51. Which of the following compounds is most acidic?

- A. Cl-CH₂-CH₂-OH



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52. The reaction which involves dichlorocarbene as an electrophile is

- A. Reimer-Tiemann reaction
- B. Kolbe's reaction
- C. Friedel-Craft's acylation
- D. Fittig reaction

Answer

53. Ethanol is converted into ethoxy ethane,

- A. by heating excess of ethanol with conc. H_2SO_4 at $140^\circ C$
- B. by heating ethanol with excess of conc. H_2SO_4 at 443 K
- C. by treating with conc. H_2SO_4 at room temperature
- D. by treating with conc. H_2SO_4 at 273 K

Answer

54. An organic compound X is oxidised by using acidified $K_2Cr_2O_7$ solution. The product obtained reacts with phenyl hydrazine but does not answer silver mirror test. The compound X is,

- A. 2-propanol
- B. Ethanal
- C. Ethanol
- D. $CH_3CH_2CH_3$

Answer

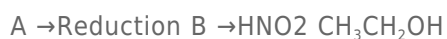
55. Predict the product 'C' in the following series of reactions:



- B. $CH_3CH(OH)C_6H_5$
- C. $CH_3CH(OH)C_2H_5$
- D. $(CH_3)_2C(OH)C_6H_5$

Answer

56. In the following sequence of reactions,



The compound A is

- A. propane nitrile
- B. ethane nitrile
- C. CH_3NO_2

D. CH_3NC

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57. Which of the following is not true?

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A. In vulcanisation, the rubber becomes harder and stronger

B. Natural rubber has 'trans' configuration at every double bond

C. Buna-S is a copolymer of butene and styrene

D. Natural rubber is 1, 4-polymer of isoprene

Answer

58. Which of the following is a polyamide?

A. Nylon-6, 6

B. Terylene

C. Polythene

D. Buna - S

Answer

59. Which of the following is correct about H-bonding in DNA?

A. A - T; G - C

B. A - G; T - C

C. G - T; A - C

D. A - A; T - T

Answer

60. Which of the following is employed as a tranquiliser?

A. Equanil

B. Naproxen

C. Tetracycline

D. Dettol

Answer