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Previous Year Paper

Chemistry - 2012



Multiple Choice Questions

1. Which one of the following has no unpaired electrons?

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

Answer

2. The "spin only" magnetic moment of Ni^{2+} in aqueous solution would be [At. no. of Ni = 28]

- A. 15 BM
- B. 2 BM
- C. 8 BM
- D. 6 BM

Answer

3. Impossible orbital among the following is

- A. $3f$
- B. $2p$
- C. $4d$
- D. $2s$

Answer

4. The total number of electrons in 18 mL of water (density = 1 g mL^{-1}) is

- A. 6.02×10^{25}
- B. 6.02×10^{24}
- C. $6.02 \times 18 \times 10^{23}$
- D. 6.02×10^{23}

Answer

5. The number of moles of hydrogen that can be added to 1 mole of an oil is the highest in

- A. groundnut oil
- B. sunflower seed oil
- C. mustard oil
- D. linseed oil

Answer

6. The equilibrium constant of a reaction is 0.008 at 298 K. The standard free energy change of the reaction is ΔG° . Like. Share. Bookmark. Download. Make Notes. Print - Your Favourite Questions. Join www.zigya.com

A. -11.96 kJ

B. -5.43 kJ

C. -8.46 kJ

D. +11.96 kJ

Answer

7. The correct order of electronegativities of N, O, F and P is

A. $F > O > P > N$

B. $F > O > N > P$

C. $N > O > F > P$

D. $F > N > P > O$

Answer

8. Which of the following is not a characteristic of a covalent compound?

A. No definite geometry

B. Insoluble in polar solvent

C. Small difference in electronegativity between the combining atoms

D. Low melting point

Answer

9. The volume of 0.1 M oxalic acid that can be completely oxidized by 20 mL of 0.025 M KMnO_4 solution is

A. 25 mL

B. 12.5 mL

C. 37.5 mL

D. 125 mL

Answer

10. A ligand is a

A. Bronsted acid

B. either a Lewis acid or a Lewis base

C. Lewis base

D. Lewis acid

Answer

11. The vapour pressures of two liquids A and B in their pure states are in the ratio of 1 : 2. A binary solution of A and B contains A and B in the mole proportion of 1 : 2. The mole fraction of A in the vapour phase of the solution will be

A. 0.2

B. 0.25

C. 0.52

D. 0.33

Answer

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- A. The total entropy of the universe is continuously decreasing
B. The total energy of the universe is continuously decreasing

- C. The total energy of the universe remains constant
D. The total entropy of the universe remains constant

Answer

13. 5 mL of 0.4 N NaOH is mixed with 20 mL of 0.1 N HCl. The pH of the resulting solution will be

- A. 7
B. 8
C. 5
D. 6

Answer

14. On adding which of the following, the pH of 20 mL of 0.1 N HCl will not alter?

- A. 20 mL of distilled water
B. 1 mL of 0.1 N NaOH
C. 500 mL of HCl of pH = 1
D. 1 mL of 1 N HCl

Answer

15. The C-H bond and C-C bond in ethane are formed by which of the following types of overlap?

- A. sp^2 -s and sp^2 - sp^2
B. sp-s and sp-sp
C. p-s and p-p
D. sp^3 -s and sp^3 - sp^3

Answer

16. At 300 K, a gaseous reaction $A \rightarrow B + C$ was found to follow first order kinetics. Starting with pure A, the total pressure at the end of 20 min was 100 mm of Hg. The total pressure after the completion of the reaction is 180 mm of Hg. The partial pressure of A (in mm of Hg) is

- A. 90
B. 180
C. 80
D. 100

Answer

17. Which one of the following has a magnetic moment of 1.75 BM?

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

Answer

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A. $C < N < O < F$

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B. $C < O < N < F$ C. $F < O < N < C$ D. $F < N < C < O$

Answer

19. The correct set of four quantum numbers for the outermost electron of sodium ($Z = 11$) is

A. 3, 1, 1, 12

B. 3, 2, 1, 12

C. 3, 0, 0, 12

D. 3, 1, 0, 12

Answer

20. The equivalent mass of a certain bivalent metal is 20. The molecular mass of its anhydrous chloride is

A. 111

B. 55.5

C. 75.5

D. 91

Answer

21. 2 moles of N_2O_4 (g) is kept in a closed container at 298 K and under 1 atm pressure. It is heated to 596 K when 20% by mass of N_2O_4 (g) decomposes to NO_2 . The resulting pressure is

A. 1.2 atm

B. 4.8 atm

C. 2.8 atm

D. 2.4 atm

Answer

22. Which one of the following contains ionic, covalent and coordinate bonds?

A. NaCl

B. NaCN

C. NaNC

D. NaOH

Answer

23. A gas expands from a volume of $1m^3$ to a volume of $2m^3$ against an external pressure of $10^5 Nm^{-2}$. The work done by the gas will beA. 10^2 kJB. 10^2 JC. 10^3 JD. 10^5 kJLike. Share. Bookmark. Download. Make Notes. Print - Your Favourite Questions. Join www.zigya.com

24. The mass of a non-volatile solute of molar mass 40 g mol^{-1} that should be dissolved in 114 g of octane to lower its vapour pressure by 20% is

A. 11.4 gm
B. 9.8 gm
C. 12.8 gm
D. 10 gm

Answer

25. The approximate time duration in hours to electroplate 30 g of calcium from molten calcium chloride using a current of 5 A is [At. mass of Ca = 40]

A. 80
B. 10
C. 16
D. 8

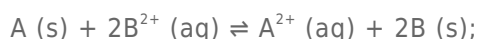
Answer

26. The pH of the solution obtained by mixing 100 ml of a solution of pH = 3 with 400 mL of a solution of pH = 4 is

A. $7 - \log 2.8$
B. $4 - \log 2.8$
C. $5 - \log 2.8$
D. $3 - \log 2.8$

Answer

27. The equilibrium constant of the reaction



$$E_{\text{cell}}^{\circ} = 0.0295 \text{ V is } 2.303 \text{ RTF} = 0.059$$

A. 2×10^2
B. 3×10^2
C. 2×10^5
D. 10

Answer

28. Which one of the following is not true regarding electromeric effect?

A. It is a temporary effect
B. It operates on multiple bonds
C. It requires an attacking reagent
D. It results in the appearance of partial charges on the carbon atoms

Answer

29. 20 mL of methane is completely burnt using 50 mL of oxygen. The volume of the gas left after

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B. 60 mL

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C. 30 mL

D. 80 mL

Answer

30. The reaction between sodium and water can be made less vigorous by

- A. adding a little alcohol
- B. amalgamating sodium
- C. adding a little acetic acid
- D. lowering the temperature

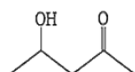
Answer

31. The s-block element used as a catalyst in the manufacture of Buna-S rubber is

- A. Ca
- B. Ba
- C. Na
- D. Mg

Answer

32. The IUPAC name of



- A. 2-hydroxy-4-pentanone
- B. 2-oxo-4-pentanol
- C. 4-keto-2-pentanol
- D. 4-hydroxy-2-pentanone

Answer

33. The percentage of *p*-character of the hybrid orbitals in graphite and diamond are respectively

- A. 50 and 75
- B. 67 and 75
- C. 33 and 75
- D. 33 and 25

Answer

34. An oxygen containing organic compound was found to contain 52% carbon and 13% of hydrogen. Its vapour density is 23. The compound reacts with sodium metal to liberate hydrogen. A functional isomer of this compound is

- A. ethanal
- B. methoxy methane
- C. methoxy ethane
- D. ethanol

Answer

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below

Expt no.	[A]	[B]	Rate (mol dm ⁻³ s ⁻¹)
1.	0.2	0.2	2
2.	0.2	0.4	4
3.	0.6	0.4	36

The rate law for the above reaction is

- A. $r = k[A][B]^2$
- B. $r = k[A]^3[B]$
- C. $r = k[A]^2[B]^2$
- D. $r = k[A]^2[B]$

Answer

36. The atomic number of cobalt is 27. The EAN of cobalt in $\text{Na}_3[\text{CoNO}_2)_4\text{Cl}_2]$ is

- A. 24
- B. 36
- C. 34
- D. 35

Answer

37. All colloidal dispersions have

- A. low osmotic pressure
- B. no osmotic pressure
- C. high osmotic pressure
- D. very high osmotic pressure

Answer

38. Silver iodide is used for producing artificial rain because AgI

- A. is easy to synthesize
- B. has crystal structure similar to ice
- C. is insoluble in water
- D. is easy to spray at high altitude

Answer

39. The function of potassium ethyl xanthate in froth floatation process is to make the ore

- A. water repellant
- B. lighter
- C. heavier

D. attracted towards water

40. Which one of the following has a potential more than zero?

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A. Pt, 12H_2 (1 atm) | HCl (2M)

B. Pt, 12H_2 (1 atm) | HCl (0.1 M)

C. Pt, 12H_2 (1 atm) | HCl (0.5 M)

D. Pt, 12H_2 (1 atm) | HCl (1M)

Answer

41. A first order reaction is 60% complete in 20 minutes. How long will the reaction take to be 84% complete?

A. 68 min

B. 40 min

C. 76 min

D. 54 min

Answer

42. From the Ellingham graphs on carbon, which of the following statements is false?

A. CO reduces Fe_2O_3 to Fe at less than 983 K

B. CO is less stable than CO_2 at more than 983 K

C. CO reduces Fe_2O_3 to Fe in the reduction zone of blast furnace

D. CO_2 is more stable than CO at less than 983 K

Answer

43. Which of the following is a negatively charged bidentate ligand?

A. Cyano

B. Ethylene diamine

C. Acetato

D. Dimethyl glyoximato

Answer

44. The secondary valency of platinum in tetra amminedichloroplatinum (IV) chloride is

A. +2

B. 3

C. 6

D. +4

Answer

45. The ore that is concentrated by the froth floatation process is

A. cryolite

B. cuprite

C. calamine

D. chalcopyrites

Answer

46. During the adsorption of a gas on the surface of a solid, which of the following is true?

- A. $\Delta G < 0, \Delta H < 0, \Delta S < 0$
 B. $\Delta G < 0, \Delta H < 0, \Delta S < 0$
 C. $\Delta G < 0, \Delta H < 0, \Delta S > 0$
 D. $\Delta G < 0, \Delta H > 0, \Delta S < 0$

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Answer

47. 100 mL of 0.1 M acetic acid is completely neutralized using a standard solution of NaOH. The volume of ethane obtained at STP after the complete electrolysis of the resulting solution is
- 56 mL
 - 224 mL
 - 560 mL
 - 112 mL

Answer

48. Saccharin, an artificial sweetener is manufactured from
- toulene
 - cyclohexane
 - starch
 - cellulose

Answer

49. Which of the following is not true for S_N1 reaction?
- 3° -alkyl halides generally react through S_N1 reaction
 - The rate of the reaction does not depend upon the molar concentration of the nucleophile
 - 1° -alkyl halides generally react through S_N1 reaction
 - It is favoured by polar solvents

Answer

50. Oil of winter green is
- a carboxylic acid
 - an alcohol
 - a ketone
 - an ester

Answer

51. An organic compound 'A' burns with a sooty flame. It is negative towards Tollen's reagent test and positive for Borsche's reagent test. The compound 'A' is
- acetophenone
 - acetone
 - salicylic acid
 - benzaldehyde

Answer

52. HCHO was treated with a reagent X. The product formed upon hydrolysis in the presence of an
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A. alcoholic KOH

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B. alcoholic KCN

C. CH_3MgI

D. aqueous KOH

Answer

53. Benzylamine is a stronger base than aniline because

A. the lone pair of electrons on the nitrogen atom in aniline is delocalised

B. the lone pair of electrons on the nitrogen atom in aniline is not involved in resonance

C. benzylamine has a higher molecular mass than aniline

D. the lone pair of electrons on the nitrogen atom in benzylamine is delocalised

Answer

54. The relative acidic strengths of benzoic acid, *o*-toluic acid and *p*-toluic acid is of the decreasing order

A. *o*-toluic acid > *p*-toluic acid > benzoic acid

B. *p*-toluic acid > benzoic acid > *o*-toluic acid

C. *o*-toluic acid > benzoic acid > *p*-toluic acid

D. *p*-toluic acid > *o*-toluic acid > benzoic acid

Answer

55. A given sample of milk turns sour at room temperature (27°C) in 5 h. In a refrigerator at -3°C , it can be stored 10 times longer. The energy of activation for the souring of milk is

A. $2.303 \times 5 R \text{ kJ mol}^{-1}$

B. $2.303 \times 3 R \text{ kJ mol}^{-1}$

C. $2.303 \times 2.7 R \text{ kJ mol}^{-1}$

D. $2.303 \times 10 R \text{ kJ mol}^{-1}$

Answer

56. Sucrose is not a reducing sugar since

A. it contains no free aldehyde or keto group adjacent to, $-\text{CHOH}$ group

B. it is built up of a fructose unit

C. it is optically active

D. it is chemically stable

Answer

57. Dialysis can be used to separate

A. protein and starch

B. glucose and protein

C. glucose and NaCl

D. glucose and fructose

Answer

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58. Which one of the following is not formed when a mixture of methyl bromide and bromobenzene is heated with sodium metal in the presence of dry ether?

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- A. diphenyl
B. propane
C. toluene
D. ethane

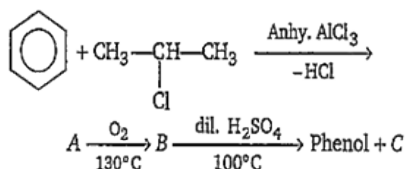
Answer

59. Power alcohol is a mixture of

- A. 80% petrol + 20% ethanol + small quantity of benzene
B. 80% ethanol + 20% benzene + small quantity of petrol
C. 50% Petrol + 50% ethanol + small quantity of benzene
D. 80% petrol + 20% benzene + small quantity of ethanol

Answer

60. Identify 'C' in the following



- A. ethanol
B. propanone
C. cumene hydroperoxide
D. water

Answer