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Previous Year Paper

Chemistry - 2010

Multiple Choice Questions

1. If the equilibrium constant for the reaction,
   H2(g) + I2(g) ⇌ 2HI (g) is K. what is the equilibrium constant of HI(g) ⇌ 12H2(g) + 12I2(g) ?

   A. 1/K
   B. √K
   C. K
   D. 1/√K

   Answer

2. The pH of 0.01 M solution of acetic acid is 5.0. What are the values of $[H^+]$ and K_a respectively?

   A. 1×10^{-5}M, 1×10^{-8}
   B. 1×10^{-5}M, 1×10^{-9}
   C. 1×10^{-4}M, 1×10^{-8}
   D. 1×10^{-3}M, 1×10^{-8}

   Answer

3. A system is provided with 50 J of heat and the work done on the system is 10 J. What is the change in internal energy of the system in Joules?

   A. 60
   B. 40
   C. 50
   D. 10

   Answer

4. Which one of the following transitions of an electron in hydrogen atom emits radiation of the lowest wavelength?

   A. $n_2 = \infty$ to $n_1=2$
   B. $n_2= 4$ to $n_1 =3$
   C. $n_2= 2$ to $n_1 =1$
   D. $n_2 = 5$ to $n_1=3$

   Answer

5. Which one of the following conditions is incorrect for a well behaved wave function (Ψ)?

   A. Ψ must be fine

B. Ψ must be single valued

C. Ψ must be infinite

D. Ψ must be continuous

Answer

6. The electron affinity values of elements A, B, C and D are respectively -135, -60, -200 and -348 kJ $mol^{-1.}$ The outer electronic configuration of element B is

A. $3s^2\ 3p^5$

B. $3s^2\ 3p^4$

C. $3s^2\ 3p^3$

D. $3s^2\ 3p^2$

Answer

7. Match the following

	Column I (molecules)		Column II (number of lone pair on central atom)
A	NH_3	1	Three
B	H_2O	2	Two
C	XeF_2	3	Zero
D	CH_4	4	Four
		5	One

A. A B C D
5 1 3 2

B. A B C D
3 1 2 5

C. A B C D
5 1 2 3

D. A B C D
1 5 3 4

Answer

8. The number of molecules of CO_2 liberated by the complete combustion of 0.1 g atom of graphite in air is

A. 3.01×10^{22}

B. 6.02×10^{23}

C. 6.02×10^{22}

D. 3.01×10^{23}

Answer

9. CH_4 diffuses two times faster than a gas X. The number of molecules present in 32 g ofgas X is (N is Avogadro number)

A. N

B. N/2

C. N/4

D. N/16

Answer

10. The orange coloured compound formed when H_2O_2 is added to TiO_2 solution acidified with conc. H_2SO_4 is

A. Ti_2O_3

B. $H_2Ti_2O_8$

C. H_2TiO_3

D. H_2TiO_4

Answer

11. Solvay process is used in the manufacture of

A. K_2CO_3

B. $KHCO_3$

C. Na_2CO_3

D. $CaCl_2$

Answer

12. Diborane reacts with ammonia under different conditions to give a variety of products. Which one among the following is not formed in these reactions?

A. B_2H_6 $2NH_3$

B. $B_{12}H_{12}$

C. $B_3N_3H_6$

D. $(BN)_n$

Answer

13. The acceptable level of carbon monoxide gas (CO) in the atmosphere in ppm level is

A. 9

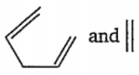
B. 250

C. 49

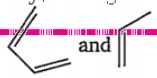
D. 850

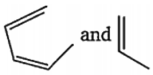
Answer

14. Diels-Alder reaction will not take place with which of the following reactants?

A.  and ||

B. 

C. 

D. 

Answer

15. In which of the following, ortho/para substitution by an electrophile is very facile?
    A. Ntrobenzene
    B. Phenol
    C. Benzoic acid
    D. Acetophenone

    Answer

16. Reduction of nitrobenzene with Zn and alcoholic KOH solution results in the formation of the following compound.
    A. hydrazobenzene
    B. azobenzene
    C. aniline
    D. phenylhydroxylamine

    Answer

17. A solution of concentration C g equiv/L has a specific resistance R. The equivalent conductance of the solution is
    A. R/C
    B. C/R
    C. 1000/RC
    D. 1000R/C

    Answer

18. Assertion (A): White tin is an example of tetragonal system.
    Reasoning (R): For a tetragonal system a= b = c and $\alpha = \beta = \gamma \neq 90°$. The correct answer is
    A. (A) and (R) are true and (R) is the correct explanation of (A).
    B. Both (A) and (R) are true and (R) is not the correct explanation of (A).
    C. (A) is true but (R) is not true.
    D. (A) is not true but (R) is true.

    Answer

19. What is the slope of the straight line for the graph drawn between ln k and 1/T, where k is the rate constant of a reaction at temperature T?
    A. $-E_a/ 2.303R$
    B. $-E_a/R$
    C. E_a/R

Answer

20. Which one of the following is the mineral for tin?

    A. Galena
    B. Cerussite
    C. Cassiterite
    D. Anglesite

Answer

21. The made of nitrogen formed by thermal decomposition of NH_4NO_3 is

    A. NO
    B. N_2O
    C. N_2O_5
    D. NO_2

Answer

22. Which one of the following is most acidic?

    A. H_2O
    B. H_2S
    C. H_2Te
    D. H_2Se

Answer

23. Which one of the following is formed apart from sodium chloride when chlorine reacts with hot concentrated sodium hydroxide?

    A. NaOCl
    B. $NaClO_3$
    C. $NaClO_2$
    D. $NaClO_4$

Answer

24. Helium mixed with oxygen is used in the treatment of

    A. beri beri
    B. burning feet
    C. joints burning
    D. asthma

Answer

25. Which of the following is a correct statement?

    A. Aqueous solutions of Cu^+ and Zn^{2+} are colourless
    B. Aqueous solutions of Cu^{2+} and Zn^{2+} are colourless
    C. Aqueous solution of Fe^{3+} is green in colour

D. Aqueous solution of MnO^-_4 is colourless

Answer

26. The chemical reaction that involves roasting process is

A. $Fe_2O_3 + 3CO \rightarrow 2Fe + 3CO_2$

B. $2Al + Fe_2O_3 \rightarrow 2Fe + Al_2O_3$

C. $2ZnS + 3O_2 \rightarrow 2ZnO + 3SO_2$

D. $FeO + SiO_2 \rightarrow FeSiO_3$

Answer

27. The ratio of anion radius to cation radius of a crystal is 10 : 9.3. Then, the coordination number of the cation in the crystal is

A. 2

B. 6

C. 4

D. 8

Answer

28. If $BaCl_2$,ionizes to an extent of 80% in aqueous solution, the value of van't Hoff factor is

A. 2.6

B. 0.4

C. 0.8

D. 2.4

Answer

29. X is a non-volatile solute and Y is a volatile solvent. The following vapour pressures are observed by dissolving X in Y.

X/mol L^{-1}	**Y/mm of Hg**
0.10	p_1
0.25	p_2
0.01	p_3

The correct order of vapour pressures is

A. $p_1 < p_2 < p_3$

B. $p_3 < p_2 < p_1$

C. $p_3 < p_1 < p_2$

D. $p_2 < p_1 < p_3$

Answer

30. At a certain temperature and at infinite dilution, the equivalent conductances of sodium

benzoate, hydrochloric acid and sodium chloride are 240, 349 and 229 ohm^{-1} cm^{2}equiv^{-1} respectively. The equivalent conductance of benzoic acid in ohm^{-1} cm^{2}equiv^{-1} at the same conditions is

A. 80

B. 328

C. 360

D. 408

Answer

31. A micelle formed during the cleansing action by soap is

A. a discrete particle of soap

B. aggregated particles of soap and dirt

C. a discrete particle of dust

D. an aggregated particle of dust and water

Answer

32. The conversion of O-acylated phenol in presence of $AlCl_3$ to C-acylated phenol is an example for this type of organic reaction

A. addition reaction

B. substitution reaction

C. molecular rearrangement

D. elimination reaction

Answer

33. The pairs 2R, 3R-butane diol and 2S, 3S-butane diol are enantiomeric.

A. 2R, 3R and 2S, 3S

B. 2S, 3S and 2S, 3R

C. 2R, 3R and 2R, 3S

D. 2S, 3S and 2R, 3S

Answer

34. The two enantiomers of secondary butyl chloride differ from each other in which one of the following properties?

A. Boiling point

B. Specific rotation

C. Density

D. Cl—Cl bond length

Answer

35. Identify the product (A) of the following reaction,

C2H5-O-C2H5 + CO →500atmBF3/150°C A

A. ethyl alcohol

B. ethyl propionate

C. ethanoic acid

D. ethyl acetate

Answer

36. Which one of the following gives yellow precipitate with iodine and NaOH solution?

A. CH_3—CHO

B. $C_6H_5COC_6H_5$

C. HCHO

D. CH_3OH

Answer

37. Identify A, B and C in the following reactions

CH3Cl + →KCN A →H3O⊕hydrolysis B →ΔC2H5OH/ H+ C

A. CH3NCA, CH3NHCH3 ,B CH3-N(CH3)-C2H5C

B. CH3CNA, CH3CONH2B, CH3CO2HC

C. CH3CNA, CH3CO2HB, CH3CO2C2H5C

D. CH3CNA, CH3CO2HB, (CH3CO)2OC

Answer

38. If the number average molecular weight and weight average molecular weight of a polymer are 40000 and 60000 respectively, the polydispersity index of the polymer will be

A. >1

B. <1

C. 1

D. zero

Answer

39. The AT/GC ratio in human beings is (where A = adenine, T = thymine, G = Guanine, C = cytosine).

A. 1

B. 1.52

C. 9.3

D. 2

Answer

40. Identify the non-narcotic analgesic from the following

A. diazepam

B. ibuprofen

C. formalin

D. terpineol

Answer