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Previous Year Paper

Chemistry - 2015

Multiple Choice Questions

1. What is the structure of XeF_6?
   A. Tetrahedral
   B. Distorted octahedral
   C. Octahedral
   D. None of these

   Answer

2. Lowering of vapour pressure is highest for
   A. 0.1 M $BaCl_2$
   B. 0.1 M glucose
   C. 0.1 M $MgSO_4$
   D. Urea

   Answer

3. The set representing the correct order of ionic radius is
   A. $Li^+ > Be^{2+} > Na^+ > Mg^{2+}$
   B. $Na^+ > Li^+ > Mg^{2+} > Be^{2+}$
   C. $Li^+ > Na^+ > Mg^{2+} > Be^{2+}$
   D. $Mg^{2+} > Be^{2+} > Li^+ > Na^+$

   Answer

4. NaOH is a strong base. What will the be pH of 5.0×10^{-2} M NaOH solution? (log 2 = 0.3)
   A. 14.00
   B. 13.70
   C. 13.00
   D. 12.70

   Answer

5. The enthalpy of combustion for the H_2, cyclohexene and cyclohexane are -241, -3800 and -3920 kJ mol^{-1} respectively. Heat of hydrogenation of cyclohexene is
   A. 121 kJ mol^{-1}
   B. -121 kJ mol^{-1}
   C. 242 kJ mol^{-1}
   D. -242 kJ mol^{-1}

Answer

6. The value of K_c for the dissociation reaction, H_2 (g) ⇌ 2H (g) is 1.2×10^{-42}
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This equilibrium mixture contains mainly

   A. H_2 (g)
   B. H (g) atom
   C. 1.1 M mixture of H_2 and H
   D. 1.2 M mixture of H_2 and H

   Answer

7. K_{sp} of $CaSO_4$ is 4×10^{-12}. $CaSO_4$ is precipitated on mixing equal volumes of the following solutions.

   A. 3×10^{-10} M $CaCl_2$ and 3×10^{-6} M $(NH_4)_2SO_4$
   B. 4×10^{-6} M $CaCl_2$ and 3×10^{-6} M $(NH_4)_2SO_4$
   C. 6×10^{-6} M $CaCl_2$ and 3×10^{-16} M $(NH_4)_2SO_4$
   D. In all the above cases

   Answer

8. Which of the following is the correct decreasing order of oxidation state of nitrogen?

   A. $HNO_3 > NO > NH_4Cl > N_2$
   B. $HNO_3 > NO > N_2 > NH_4Cl$
   C. $HNO_3 > NH_4Cl > NO > N_2$
   D. $NO > HNO_3 > NH_4Cl > N_2$

   Answer

9. Which of the following has highest electron affinity?

   A. N
   B. O
   C. F
   D. Cl

   Answer

10. The shape of XeO_2F_2 molecule is

   A. trigonal bipyramidal
   B. square planar
   C. tetrahedral
   D. see-saw

   Answer

11. The radius of which of the following orbit is same as that of the first Bohr's orbit of hydrogen atom?

   A. Li^{2+} (n = 2)

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B. Li^{2+} (n = 3)

C. Be^{3+} (n = 2)

D. He^{+} (n = 2)

Answer

12. Van der waals' real gas, acts as an ideal gas at which condition?

    A. High temperature, low pressure

    B. Low temperature, high pressure

    C. High temperature, high pressure

    D. Low temperature, low pressure

    Answer

13. Ionisation energy in group 1A varies in the decreasing order as

    A. Li > Na > K > Cs

    B. Na > Li > K > Cs

    C. Li > Cs > K Na

    D. K > Cs > Na > Li

    Answer

14. Intramolecular hydrogen bond is present in

    A. water

    B. *o*-nitrophenol

    C. *p*-nitrophenol

    D. methylamine

    Answer

15. Which one of the following species acts as both Bronsted acid and base?

    A. H_2PO2-

    B. HPO32-

    C. HPO42-

    D. All of these

    Answer

16. The reaction, $SO_2 + O_2 \rightarrow 2SO_2$ + Heat.

    The equilibrium reaction proceeds in forward direction by

    A. addition of O_2

    B. removal of O_2

    C. addition of inert gas

    D. cannot proceed

    Answer

17. Which is soluble in $NaNO_3$ and dil. HCl mixture and forming salt?

    A. $(CH_3)_3CNH_2$

B. $(CH_3)_2CHNH_2$

C. $(CH_3)_2NH$

D. $(CH_3)_3N$

Answer

18. An example of a non-stoichiometric compound is

A. PbO

B. NiO_2

C. Al_2O_3

D. Fe_3O_4

Answer

19. Which of the following type of forces are present in vulcanised rubber?

A. Weakest intermolecular forces

B. Hydrogen bonding

C. Three dimensional network of bonds

D. Metallic bonding

Answer

20. If $H_f(H_2O)$ is -286.20 kJ mol^{-1}, then Hf° (OH^-) is

A. -228.88 kJ mol^{-1}

B. +228.88 kJ mol^{-1}

C. -343.52 kJ mol^{-1}

D. +343.52 kJ mol^{-1}

Answer

21. 1 mole of gas occupying 3 L volume is expanded against a constant external pressure of 1 atm to a volume of 15 L. The work done by a system is equal to

A. -1.215×10^3 J

B. -12.15×10^3 J

C. $+1.215 \times 10^3$ J

D. $+12.15 \times 10^3$ J

Answer

22. The EM2+/ M2+° value for Cr, Mn, Fe and Co are -0.41, +0.77 and +1.97 V respectively. For which one of these metals the change in oxidation state from +2 to +3 is easiest?

A. Cr

B. Mn

C. Fe

D. Co

Answer

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23. The oxidation numbers of phosphorus in $Ba(H_2PO_2)_2$ and xenon in Na_4XeO_6 respectively are

    A. +3 and +4

    B. +2 and +6

    C. +1 and +8

    D. -1 and -6

    Answer

24. Setting of plaster of Paris is

    A. dehydration

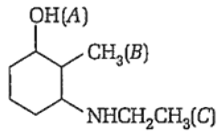
    B. oxidation with atmospheric oxygen

    C. combination with atmospheric CO_2

    D. hydration to yield another hydrate

    Answer

25. In the following compound, groups designated as A, B, C will be numbered as



    A. 3, 2, 1

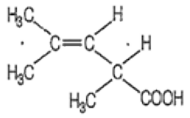
    B. 6, 1, 2

    C. 3, 1, 2

    D. 1, 2, 3

    Answer

26. The following compound can exhibit



    A. geometrical isomerism

    B. geometrical and optical isomerism

    C. optical isomerism

    D. tautomerism

    Answer

27. The IUPAC name for

    $CH_3CH{=}CHCH_2C(NH_2)H\text{-}CH_2\text{-}COOH$

    A. 5-amino-2-heptenoic acid

    B. 5-amino hex-2-ene-carboxylic aod

    C. 3-amino-5-heptenoic acid

    D. β-amino-δ-heptenoic acid

    Answer

28. Which is not an electrophile?

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A. C_2H_5

B. $C+H_3$

C. BF_3

D. SO_3

Answer

29. Petroleum is obtained from water gas, name of the reaction involved is

A. Fischer-Tropsch

B. Benzoic

C. Dow's

D. Kjeldahl's

Answer

30. Which of the following is correct increasing order for the value of em ?

A. e < p < n < α

B. n < p < e < α

C. n < p < α < e

D. n < α < p < e

Answer

31. During nuclear explosion one of the products is ^{90}Sr with half-life of 28.1 yr. If 1 μg of ^{90}Sr was absorbed in the bones of a newly born body instead of calcium, how much of it will remain after 60 yr, if it is not lost metabolically?

A. 0.184 μg

B. 0.025 μg

C. 0.262 μg

D. 0.228 μg

Answer

32. A colloidal system having a solid substance as a dispersed phase and a liquid as a dispersion medium is classified as

A. solid sol

B. gel

C. emulsion

D. sol

Answer

33. In a first order reaction, the concentration of the reactant, decreases from 0.8 M to 0.4 M in 15 min. The time taken for the concentration to change from 0.1 M to 0.025 M is

A. 30 min

B. 15 min

C. 7.5 min

D. 160 min

Answer

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34. Calculate the osmotic pressure of 0.01 M solution of cane sugar at 300 K (R = 0.08212 atm degree^{-1} mol^{-1})
    A. 0.3568 atm
    B. 0.2463 atm
    C. 0.1562 atm
    D. 0.5623 atm

    Answer

35. Given, ECr3+/ Cr° = -0.72 V, EFe2+/ Fe° = -0.42 V. The potential for the cell Cr | Cr^{3+} (0.1 M) || Fe^{2+} (0.01 M) | Fe is
    A. 0.26 V
    B. 0.399 V
    C. -0.399 V
    D. -0.26 V

    Answer

36. In a reaction, A + B → C, the rate expression is R = k [A][B]^2. If the concentration of both the reactant is doubled at constant volume, then the rate of the reaction will be
    A. eight times
    B. double
    C. quadruple
    D. triple

    Answer

37. Red lead is
    A. PbO
    B. Pb_3O_4
    C. PbO_2
    D. Pb_4O_3

    Answer

38. Which among the following will anisotrophy?
    A. glass
    B. plastic
    C. barium chloride
    D. wood

    Answer

39. Concentrated HNO_3 forms NO2+ in the presence of
    A. Conc. H_2SO_4
    B. Fe
    C. $FeBr_3$
    D. $AlCl_3$

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Answer

40. $CH_3MgBr + CH_2 = CH\text{-}COH \rightarrow H3O+$ Product
It is (1 : 4 addition)

    A. CH_2=CH-C||CH3OH- H
    B. CH_2OH-CH=CH-CH_3
    C. $CH_3CH_2CH_2CHO$
    D. None of the above

Answer

41. Teflon is an example of polymer which is a/ an
    A. polyamide
    B. addition polymer
    C. polyester
    D. formaldehyde resin

Answer

42. Which of the following are addition polymers?
    A. Nylon
    B. Melamine formaldehyde resin
    C. Orlon
    D. All of these

Answer

43. Which one is least reactive in a nucleophilic substitution reaction?
    A. CH_3CH_2Cl
    B. CH_2=$CHCH_2Cl$
    C. CH_2=CHCl
    D. $(CH_3)_3CCl$

Answer

44. Benzaldehyde reacts with CH_3NH_2 forming
    A. Schiff's base
    B. Hofmann base
    C. Saytzeff base
    D. None of these

Answer

45. A solution of D-glucose in water rotates the plane of polarised light
    A. to the left
    B. to the right
    C. to either side
    D. None of these

Answer

46. Which of the following pairs give positive Fehling's test?
    A. Glucose, sucrose
    B. Glucose, fructose
    C. hexaual, acetophenone
    D. Fructose, sucrose

Answer

47. Which pair of polymers have similar properties?
    A. Nylon, PVC
    B. PAN, PTFE
    C. PCTFE, PTFE
    D. Bakelite, alkyle resin

Answer

48. Number of esters of the molecular formula $C_3H_6O_2$ can be
    A. 4
    B. 3
    C. 2
    D. 1

Answer

49. TEL is a compound used as
    A. antibiotic
    B. antiseptic
    C. antiknocking
    D. antioxidant

Answer

50. Aldol condensation reaction is not given by
    A. $C_6H_5CH_2CHO$
    B. C_6H_5CHO
    C. CH_3CHO
    D. CH_3COCH_3

Answer