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Previous Year Paper

Chemistry - 2014

Multiple Choice Questions

1. Which among the following gases can be liquified easily?
   A. Chlorine
   B. Nitrogen
   C. Oxygen
   D. Hydrogen

   Answer
2. The plot of square root of frequency of X-ray emitted against atomic number led to suggestion of which law/rule?
   A. Periodic law
   B. Modern periodic law
   C. Hund's rule
   D. Newland's law

   Answer
3. If average velocity of a sample of gas molecules at 300 K is 5 cm s^{-1}, what is RMS velocity of same sample of gas molecules at the same temperature? (Given, α: u: v = 1:1.224: 1.127)
   A. 6.112 cm/s
   B. 4.605 cm/s
   C. 4.085 cm/s
   D. 5.430 cm/s

   Answer
4. 20 mL solution of 0.1 M ferrous sulphate was completely oxidised using a suitable oxidising agent. What is the number of electrons exchanged?
   A. 1.204×10^{22}
   B. 193
   C. 1930
   D. 1.204×10^{21}

   Answer
5. The volume of oxygen evolved at STP by decomposition of 0.68 g '20 volume' hydrogen peroxide solution is
   A. 2.24mL
   B. 22.4mL
   C. 224mL

D. 22400 l

Answer

6. What is the molality of a solution containing 200 mg of urea (molar mass 60 g mol^{-1}) dissolved in 40 g of water?

   A. 0.0825

   B. 0.825

   C. 0.498

   D. 0.0013

   Answer

7. The work done when two mole of an ideal gas is compressed form a volume of 5 m^3 to 1 dm^3 at 300 K, under a pressure of 100 kPa is

   A. 499.9kJ

   B. -499.9 kJ

   C. -99.5 kJ

   D. 42495 kJ

   Answer

8. Assuming enthalpy of combustion of hydrogen at 273 K is -286 kJ and enthalpy of fusion of ice at the same temperature to be +6.0 kJ, calculate enthalpy change during formation of 100 g of ice.

   A. +1622 kJ

   B. - 1622 kJ

   C. +292 kJ

   D. - 292 kJ

   Answer

9. What is the orbital angular momentum of an electron in 'f' orbital?

   A. 1.5hπ

   B. 6hπ

   C. 3hπ

   D. 3h2π

   Answer

10. The product of molar concentrations of hydrogen ions and hydroxide ions in a 0.01 M aqueous solution of sodium chloride is known as

    A. hydrolysis constant of salt

    B. dissociation constant of acid

    C. dissociation constant of base

    D. ionic product of water

    Answer

11. What is the pH of millimolar solution of ammonium hydroxide which is 20% dissociated?

    A. 3.699

    B. 10.301

C. 4.691

D. 9.301

Answer

12. What is the geometry of molecule of bromine penta fluoride?

A. Square planar

B. Trigonal bipyramidal

C. Squre pyramidal

D. Octahedral

Answer

13. What is the mass of one molecule of yellow phosphorus? (Atomic mass, P = 30)

A. 1.993×10^{-22} kg

B. 1.993×10^{-19} mg

C. 4.983×10^{-20} kg

D. 4.983×10^{-23} mg

Answer

14. Bond order of which among the following molecules is zero?

A. F_2

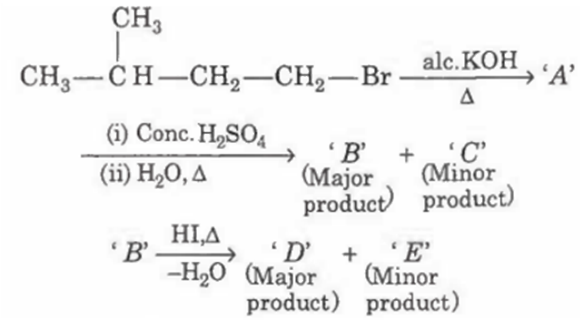
B. O_2

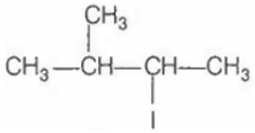
C. Be_2

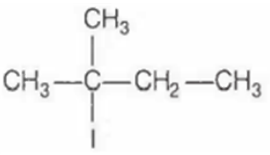
D. Li_2

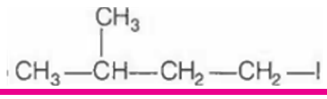
Answer

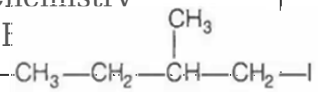
15. Identify the compound 'D' in the following series of reactions.



A. 

B. 

C. 

D. 

Answer

16. Ozone is present as a chief constituent in which region of the atmosphere?

    A. Troposphere
    B. Stratosphere
    C. Mesosphere
    D. Thermosphere

    Answer

17. Amongst the following, select the element having highest ionization enthalpy.

    A. Sodium
    B. Potassium
    C. Beryllium
    D. Magnesium

    Answer

18. Benzene can be conveniently converted into n-propyl benzene by

    A. Friedel-Craft alkylation with n-propyl chloride
    B. Friedel-Craft acylation with propionyl chloride followed by Wolff-Kishner reduction
    C. Friedel-Craft acylation with propionyl chloride followed by catalytic hydrogenation
    D. Friedel-Craft acylation with propionyl chloride followed by reduction with $LiAlH_4$

    Answer

19. Presence of nitrogen in which among the following compounds can not be detected by Lassaigne method?

    A. Hydrazine
    B. Aniline
    C. p-toluidine
    D. Picric acid

    Answer

20. Solubility of which among the following substances in water increases slightly with rise in temperature?

    A. Potassium bromide
    B. Potassium chloride
    C. Potassium nitrate
    D. Sodium nitrate

    Answer

21. Which statement is not correct about fullerene C_{60} ?

    A. It contains 20 six membered rings and 12 five membered rings
    B. All carbon atoms undergo sp^2 hybridisation
    C. A six membered ring is fused with six membered rings only

D. A five membered ring is fused with six membered ring only

Answer

22. Among the following select the alkane that is expected to have lowest boiling point

A. hexane

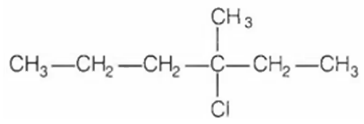
B. 2-methylpentane

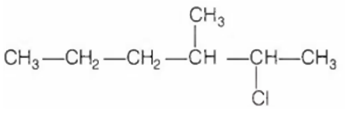
C. 3-methylpentane

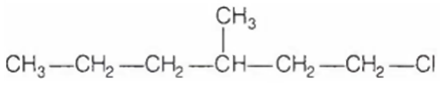
D. 2,2-dimethylbutane

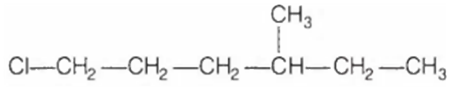
Answer

23. 'X' is an optically active alkane having lowest molecular mass, Predict the structure of the major product obtained on monochlorination of 'X'.

A. 

B. 

C. 

D. 

Answer

24. Which among the following metals is employed to provide cathodic protection to iron?

A. Zinc

B. Nickel

C. Tin

D. Lead

Answer

25. Oxidation number of nitrogen in which among the oxides of nitrogen is the lowest?

A. Nitric oxide

B. Nitrous oxide

C. Nitrogen dioxide

D. Nitrogen trioxide

Answer

26. Rate law for the reaction, A+ B → product is rate = $k[A]^2[B]$ What is the rate constant; if rate of reaction at a given temperature is 0.22 Ms^{-1}, when [A]= 1 M band [BJ= 0.25 M?

A. 3.52 $M^{-2}s^{-1}$

B. 0.88 $M^{-2}s^{-1}$

C. 1.136 $M^{-2}s^{-1}$

D. 0.05 $M^{-2}s^{-1}$

Answer

27. Which among the following metals is refined by electrolytic method?
    A. Aluminium
    B. Bismuth
    C. Tin
    D. Lead

    Answer

28. Which of the following complexes has lowest molar conductance?
    A. $CoCl3{\cdot}3NH3$
    B. $CoCl3{\cdot}4NH3$
    C. $CoCl3{\cdot}5NH3$
    D. $CoCl3{\cdot}6NH3$

    Answer

29. Which among the following group 16 elements exists in more than two allotropic states?
    A. Polonium
    B. Tellurium
    C. Selenium
    D. Oxygen

    Answer

30. How is electrical conductance of a conductor related with length and area of cross section of the conductor?
    A. $G = \kappa{\cdot}\, l{\cdot}\, a^{-1}$
    B. $G = l{\cdot}\, a{\cdot}\, \kappa^{-1}$
    C. $G = \kappa{\cdot}\, a{\cdot}\, l^{-1}$
    D. $G = \kappa{\cdot}\, a{\cdot}\, l^{-2}$

    Answer

31. Select the coloured compound amongst the following .
    (At. no. Ti= 22, Cr= 24, Cu= 29, Zn= 30)
    A. $TiCl_4$
    B. $CrCl_3$
    C. $ZnCl_3$
    D. CuCl

    Answer

32. Which among the following solids crystallises as a face centred cube?
    A. Iron
    B. Rubidium
    C. Uranium
    D. Platinum

Answer

33. Which oxyacid of sulphur contains S-S single bond?

A. Oleum

B. Marshall's acid

C. Dithionic acid

D. Thiosulphuric acid

Answer

34. Select the diamagnetic complex ion amongst the following complexes (At. no. : Fe = 26,CO = 27)

A. $K_3[Fe(CN)_6]$

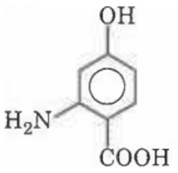
B. $[Co(NH_3)_6)Cl_3$

C. $K_3[FeF_6]$

D. $K_3[CoF_6]$

Answer

35. Write IUPAC name of following compound



A. 2-amino-4-hydroxybenzoic acid

B. 6-amino-4-hydroxybenzoic acid

C. 3-amino-4-carboxyphenol

D. 2-carboxy-4-hydroxyaniline

Answer

36. Select the ether among following that yields methanol as one the products on reaction with cold hydroiodic acid

A. 1-methoxybutane

B. 1-methoxybutane-2-methylpropane

C. 2-methoxy-2-methylpropane

D. methoxybenzene

Answer

37. The two monomers used in the preparation of dextron are

A. 3-hydroxy butanoic acid and 3-hydroxy pentanoic acid

B. ∈ amino caproic acid and glycine

C. isobutylene and isoprene

D. lactic acid and glycolic acid

Answer

38. Deficiency of which vitamin causes degeneration of spinal cord?

A. E

B. K

C. B_{12}

D. A

Answer

39. One mole of stachyose on hydrolysis yields

A. 1 mole of glucose+ 1 mole of fructose+ 2 mole of galactose

B. 2 mole of glucose + 1 mole of fructose + 1 mole of galactose

C. 1 mole of glucose+ 2 mole of fructose+ 1 mole of galactose

D. 2 mole of glucose+ 2 mole of fructose

Answer

40. Alkaline hydrolysis of which among the following compounds leads to the formation of a racemate?

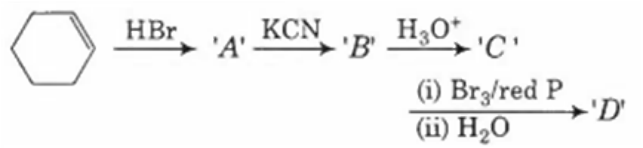
A. 1-bromo-1-phenylethane

B. 1-chloro-3-methylbutane

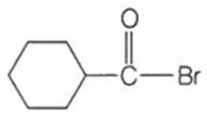
C. Bromoethane

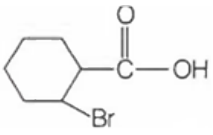
D. 1-chloropropane

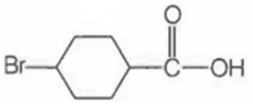
Answer

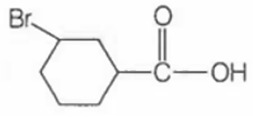
41. 

Identify the compound 'D' in above mentioned series of reactions.

A. 

B. 

C. 

D. 

Answer

42. The compound that yields only ketonic compound/s on ozonolysis is

A. but-2-ene

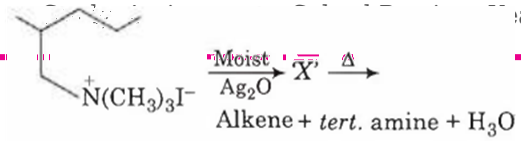
B. pent-2-ene

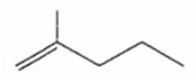
C. 2, 3-dimethylbut-2-ene

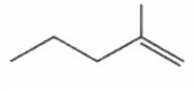
D. 2-methylbut-2-ene

Answer

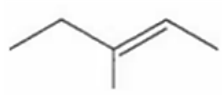
43. Identify the alkene that is produced in the following series of reactions



A. 

B. 

C. 

D. 

Answer

44. Butylated hydroxy toluene is used in

A. preventing oxidative rancidity of fats

B. preserving food grains

C. killing bacteria living tissues

D. reducing stress and anxiety

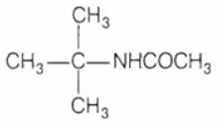
Answer

45. An organic compound X having molecular formula $C_3H_{11}N$ reacts with *p*-toluene sulphonyl chloride to form a compound Y that is soluble in aqueous KOH. Compound X is optically active and reacts with acety lchloride to form compound Z. Identify the compound Z

A. $CH_3CH_2CH_2CH_2NHCOCH_3$

B. $CH_3CH_2CH(CH_3)NHCOCH_3$

C. $CH_3(CH_3)CHCH_2NHCOCH_3$

D. 

Answer