

GGSIU chemistry 2007

1. Which of the following is not an ore of magnesium ?

a carnallite b Dolomite

c Calamine d sea water

2. The atomic number of Ni and Cu are 28 and 29 respectively. The electronic configuration $1s^2, 2s^2, 2p^6, 3s^2, 3p^6, 3d^{10}$ represents

a Cu^+ b Cu^{2+}

c Ni^{2+} d Ni

3. In the following the element with the highest ionization energy is

a $[\text{Ne}]3s^2 3p^1$ b $[\text{Ne}]3s^2 3p^3$

c $[\text{Ne}] 3s^2 3p^2$ d $[\text{Ne}]3s^2 3p^4$

4. in the conversion of Br_2 to BrO_3^- , the oxidation number of Br changes from

a zero to +5 b +1 to +5

c zero to -3 d +2 to +5

5. Among the alkali metal cesium is the most reactive because

a its incomplete shell is nearest to the nucleus

b it has a single electron in the valence shell

c it is the heaviest alkali metal

d the outermost electron is more loosely bound than the outermost electron of the other alkali metals

6. Which of the following represents the Lewis structure of N_2 molecule ?

a $\overset{x}{\underset{x}{N}} \equiv \overset{x}{\underset{x}{N}}$

b $\overset{xxx}{x} N \equiv N \overset{xxx}{x}$

c $\overset{xxx}{x} N \overset{xxx}{x} - \overset{xxx}{N} \overset{xxx}{x}$

d $\overset{xxx}{N} = \overset{xxx}{N}$

7. Hydrogen bond is strongest in

a $\text{S} - \text{H} \dots \text{O}$

b $\text{O} - \text{H} \dots \text{S}$

c F - H ... F d O - H ... N

8. The decomposition of a certain mass of CaCO_3 gave 11.2 dm^3 of CO_2 gas at STP. The mass of KOH required to completely neutralize the gas is

a 56 g b 28 g
c 42 g d 20 g

9. The density of a gas is 1.964 g dm^{-3} at 273 K and 76 cm Hg. The gas is

a CH_4 b C_2H_6
c CO_2 d Xe

10. 0.06 mole of KNO_3 solid is added to 100 cm^3 of water at 298 K. The enthalpy of KNO_3 aqueous solution is 35.8 kJ mol^{-1} . After the solute is dissolved the temperature of the solution will be

a 293 K b 298 K
c 301 K d 304 K

11. 4 moles each of SO_2 and O_2 gases are allowed to react to form SO_3 in a closed vessel. At equilibrium 25% of O_2 is used up. The total number of moles of all the gases at equilibrium is

a 6.5 b 7.0
c 8.0 d 2.0

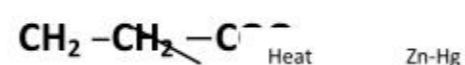
12. An example for autocatalysis is :

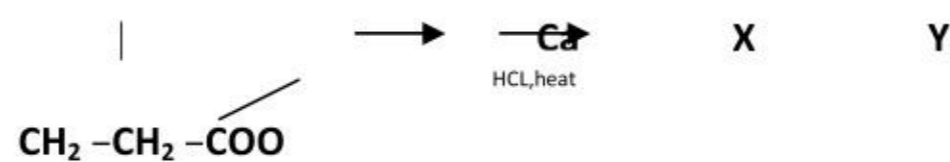
a oxidation of NO to NO_2
b oxidation of SO_2 to SO_3
c decomposition of KClO_3 to KCl and O_2
d oxidation of oxalic acid by acidified KMnO_4

13. During the fusion of an organic compound with sodium metal, nitrogen of the compound is converted into

a NaNO_2 b NaNH_2
c NaCN d NaNC

14. Identify the product Y in the following reaction sequence





- a Pentane
- b Cyclobutane
- c Cyclopentane
- d Cyclopentanone

15. The reaction $\text{C}_2\text{H}_5\text{ONa} + \text{C}_2\text{H}_5 \rightarrow \text{C}_2\text{H}_5\text{OC}_2\text{H}_5 + \text{NaI}$ is known as

- a Kolbe's synthesis
- b Wurtz's synthesis
- c Williamson's synthesis
- d Grignard's synthesis

16. Glucose contains in addition to aldehyde group

- a one secondary OH and Four primary OH groups
- b one primary OH and four secondary OH groups
- c two primary OH and three secondary OH groups
- d three primary OH and two secondary OH groups

17. Which of the following taking place in the blast furnace is endothermic ?

- a $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$
- b $2\text{C} + \text{O}_2 \rightarrow 2\text{CO}$
- c $\text{C} + \text{O}_2 \rightarrow \text{CO}_2$
- d $\text{Fe}_2\text{O}_3 + 3\text{CO} \rightarrow 2\text{Fe} + 3\text{CO}_2$

18. The formula mass of Mohr's salt is 392. The iron present in it is oxidised by KMnO_4 in acid medium. The equivalent mass of Mohr's salt is :

- a 392 b 31.6
- c 178 d 156

19. Which of the following solutions will exhibit highest boiling point ?

a 0.01 M Na_2SO_4 aq

b 0.01 M KNO_3 aq

c 0.015 M urea aq

d 0.015 M glucose aq

20. The highest magnetic moment is shown by the transition metal ion with the configuration

a $3d^2$ b $3d^5$

c $3d^7$ d $3d^9$

21. A transition metal ion exists in its highest oxidation state. It is expected to behave as

a a chelating agent

b a central metal in a coordination compound

c an oxidizing agent

d a reducing agent

22. In which of the following complex ion, the central metal ion is in a state of sp^3d^2 hybridisation?

a $[\text{CoF}_6]^{3-}$ b $[\text{Co}(\text{NH}_3)_6]^{3+}$

c $[\text{Fe}(\text{CN})_6]^{3-}$ d $[\text{Cr}(\text{NH}_3)_6]^{3+}$

23. Which of the following can participate in linkage isomerism?

a NO_2^-

.. ..

b $\text{H}_2\text{NCH}_2\text{CH}_2\text{NH}_2$

c H_2O

d $:\text{NH}_3$

24. Which of the following has the highest bond order?

a N_2 b O_2

c He_2 d H_2

25. Which of the following is diamagnetic?

- a H_2^+ b O_2
c Li_2 d He_2^+

26. The concentration of a reactant X decreases from 0.1 M to 0.005 M in 40 min. If the reaction follows first order kinetics, the rate of the reaction when the concentration of x is 0.01 M will be

- a $1.73 \times 10^{-4} \text{ M min}^{-1}$
b $3.47 \times 10^{-4} \text{ M min}^{-1}$
c $3.47 \times 10^{-5} \text{ M min}^{-1}$
d $7.5 \times 10^{-4} \text{ M min}^{-1}$

27. Chemical reactions with very high E_a values are generally

- a very fast b very slow
c moderately fast d spontaneous

28. which of the following does not conduct electricity ?

- a Fused NaCl
b Solid NaCl
c Brine solution
d Copper

29. When a quantity of electricity is passed through $CuSO_4$ solution, 0.16 g of copper gets deposited. If the same quantity of electricity is passed through acidulated water, then the volume of H_2 liberated at STP will be

[given : atomic weight of Cu = 64]

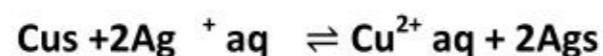
- a 4.0 cc b 56 cc
c 604 cc d 8.0 cc

30. Solubility product of a salt AB is $1 \times 10^{-8} \text{ M}^2$ in a solution in which the concentration of A^+ ions is 10^{-3} M . The salt will precipitate when the concentration of B^- ions is kept

- a between 10^{-8} M to 10^{-7} M
b between 10^{-7} M to 10^{-8} M
c $> 10^{-5} \text{ M}$

d $<10^{-8}$ M

31. Which one of the following conditions will increase the voltage of the cell represented the equation ?



- a Increase in the dimension of Cu electrode
- b Increase in the dimension of Ag electrode
- c Increase in the concentration of Cu^{2+} ions
- d Increase in the concentration of Ag^+ ions

32. The pH of 10^{-8} M HCL solution is

- a 8 b more than 8
- c between 6 and 7 d slightly more than 7

33. The mass of glucose that should be dissolved in 50 g of water in order to produce the same lowering of pressure as is produced by dissolving 1 g of urea in the same quantity of water is

- a 1 g b 3 g
- c 6 g d 18 g

34. Osmotic pressure observed when benzoic acid is dissolved in benzene is less than expected from theoretical considerations .This is because

- a benzoic acid is an organic solute
- b benzoic acid has higher molar mass than benzene
- c benzoic acid gets associated in benzene
- d benzoic acid gets dissociated in benzene

35. For a reaction to be spontaneous at all temperatures

- a ΔG and ΔH should be negative
- b ΔG and ΔH should be positive
- c $\Delta G = \Delta S = 0$
- d $\Delta H < \Delta G$

36. Which of the following electrolyte will have maximum flocculation value for Fe(OH)_2 sol ?

- a NaCl b Na_2S

c NH_4PO_4 d K_2SO_4

37. For a reversible reaction $\text{Xg} + 3\text{Yg} \rightleftharpoons 2\text{Zg}$; $\Delta H = -40 \text{ kJ}$, the standard entropies of X, Y and Z are 60, 40 and $50 \text{ JK}^{-1} \text{ mol}^{-1}$ respectively. The temperature at which the above reaction attains equilibrium is about

a 400 K b 500 K

c 273 K d 373 K

38. The radii of Na^+ and Cl^- ions are 95 pm and 181 pm respectively. The edge length of NaCl unit cell is

a 276 pm b 138 pm

c 552 pm d 415 pm

39. Inductive effect involves

a displacement of σ -electrons

b delocalization of π -electrons

c delocalization of σ -electrons

d displacement of π -electrons

40. The basicity of aniline is less than that of cyclohexylamine. This is due to

a +R effect to $-\text{NH}_2$ group

b -I effect of $-\text{NH}_2$ group

c -R effect of $-\text{NH}_2$ group

d hyperconjugation effect

41. Methyl bromide is converted into ethane by heating it in other medium with

a Al b Zn c Na d Cu

42. Which of the following compound is expected to be optically active?

a $\text{CH}_3\text{CH}_2\text{CHO}$

b $\text{CH}_3\text{CH}_2\text{CH}_2\text{CHO}$

c $\text{CH}_3\text{CH}_2\text{CHBrCHO}$

d $\text{CH}_3\text{CH}_2\text{CBr}_2\text{CHO}$

43. Which cycloalkane has the lowest heat of combustion per CH_2 group ?

a Cyclopropane b FeCl_3

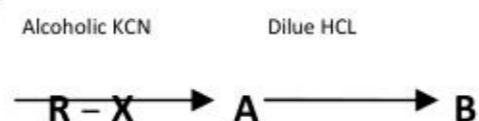
c anhydrous ZnCl_2 d Cu

44. The catalyst used in the preparation of an alkyl chloride by the action of dry HCl on an alcohol is

a anhydrous AlCl_3 b Cyclobutane

c Cyclopentane d Cyclohexane

45. In the reaction



The product B is

a Salicylic acid b Phenol

c Benzoic acid d 4-nitrobenzoic acid

46. Which of the following compound would not evolve CO_2 when treated with NaHCO_3 solution ?

a Salicylic acid b phenol

c Benzoic acid d 4-nitrobenzoic acid

47. By heating phenol with chloroform in alkali, it is converted into

a salicylic acid b salicylaldehyde

c anisole d phenyl benzoate

48. When a mixture of calcium benzoate and calcium acetate is dry distilled, the resulting compound is

a acetophenone b benzaldehyde

c benzophenone d acetaldehyde

49. Which one of the following does not give benzoic acid on hydrolysis ?

a Phenyl cyanide b Benzoyl chloride

c Benzyl chloride d Methyl benzoate

50. Which of the following would undergo Hofmann reaction to give a primary amine ?

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a R-C-Cl b RCONHCH₃

c RCONH₂ d RCOOR