

## Chemistry - 3

- How many moles are present in 2.5L of 0.2 M  $H_2SO_4$ ?  
(A) 0.25  
(B) 0.5  
(C) 0.75  
(D) 22.10
- The number of molecules in 4.25 g of  $NH_3$  is  
(a)  $1.5 \times 10^{23}$   
(b)  $2.5 \times 10^{23}$   
(c)  $3.0 \times 10^{23}$   
(d)  $8 \times 10^{23}$
- What is the wavelength associated with an electron moving with a velocity of  $10^6$  m/s?  
(given:  $h = 6.63 \times 10^{-34}$  Js )  
(a) 0.727 nm  
(b) 0.27 nm  
(c) 0.36 nm  
(d) 72.7 nm
- When the electrons of hydrogen atoms return to "L" shell from shells of higher energy levels, we get a series of lines in the spectrum. This series is called  
(a) Lyman series  
(b) Balmer series  
(c) Paschen series  
(d) Brackett series
- Which of the following has highest ionisation potential?  
(a)  $Al^+$   
(b)  $Mg^+$   
(c)  $Ne$   
(d)  $Li^+$
- Which of the following has the largest size?  
(a)  $Br^-$   
(b)  $Br$   
(c)  $Cl$   
(d)  $Cl^-$

7.  $IF_7$  has bond pairs and lone pairs respectively
- (a) 5, 2
  - (b) 2, 3
  - (c) 4, 3
  - (d) 7, 0
8. The formation of ammonia boron trifluoride adduct is an example of
- (a) Covalent bond
  - (b) Coordinate covalent bond
  - (c) Ionic bond
  - (d) Hydrogen bond
9. The temperature at which a real gas obeys ideal gas laws over a wide range of pressure is called
- (a) Critical temperature
  - (b) Inversion temperature
  - (c) Curie temperature
  - (d) Boyle temperature
10. At constant pressure a gas at  $27^\circ C$  is heated so that final volume is 25% more than initial volume. What is the final temperature?
- (a)  $33.75^\circ C$
  - (b)  $252^\circ C$
  - (c)  $77^\circ C$
  - (d)  $102^\circ C$
11. Equal volume of 1M HCl and 1M  $H_2SO_4$  are separately neutralised by adding excess NaOH. The heat evolved is  $x$  kJ and  $y$  kJ respectively. Then
- (a)  $x=y$
  - (b)  $x=y/2$
  - (c)  $x=2y$
  - (d)  $x=y/4$
12. 4 grams of methane burns to give 2.5 k.cals of heat. The heat of combustion of methane would be
- (a) 20 k.cals
  - (b) 10 k.cals
  - (c) 2.5 k.cals
  - (d) 5 k.cals

13. The forward reaction proceeds towards near completion if the equilibrium constant of a reaction is

- (a)  $k = 10^3$
- (b)  $K = 10^{-3}$
- (c)  $K = 10$
- (d)  $K = 1$

14. For the equilibrium  $2NO_2(g) = N_2O_4(g) + 14.6 \text{ k.cal}$ , the increase in temperature would

- (a) favours the formation of  $N_2O_4$
- (b) favour the decomposition of  $N_2O_4$
- (c) not alter the equilibrium
- (d) stop the reaction

15. The concentration of  $CrO_4^{2-}$  in a saturated solution of  $Na_2CrO_4$  is  $2 \times 10^{-4}$ . Solubility product of sodium chromate is

- (a)  $16 \times 10^{-12}$
- (b)  $4 \times 10^{-8}$
- (c)  $8 \times 10^{-12}$
- (d)  $32 \times 10^{-12}$

16. Lewis acids are those substances

- (a) which accept an electron pair
- (b) which provide  $H^+$  ion in the solution
- (c) which give an electron pair
- (d) which accept  $OH^-$  ion

17. If three electrons are lost by a metal ion  $M^{+2}$ , its final oxidation number would be

- (a) Zero
- (b) +5
- (c) +2
- (d) +4

18. Oxidation number of S in  $Na_2S_4O_6$  (sodium tetrathionate) is

- (a) +1.5
- (b) +2.5
- (c) +3
- (d) +2

19. The number of electrons required to balance the following equation  $NO_3^- + 4H^+ + e^- \rightarrow 2H_2O + NO$  is
- (a) 5
  - (b) 4
  - (c) 3
  - (d) 2
20. Blackened oil painting can be restored into original form by treating with
- (a)  $BaO_2$
  - (b)  $MnO_2$
  - (c) Chlorine
  - (d)  $H_2O_2$
21. Which of the following processes will produce hard water?
- (a) addition of sodium sulphate to water
  - (b) saturation of water with  $CaCO_3$
  - (c) saturation of water with  $CaSO_4$
  - (d) saturation of water with  $MgCO_3$
22. Dead burnt plaster is
- (a)  $CaSO_4$
  - (b)  $CaSO_4 \cdot 1/2H_2O$
  - (c)  $CaSO_4 \cdot H_2O$
  - (d)  $CaSO_4 \cdot 2H_2O$
23. What are the products formed when  $Li_2CO_3$  undergoes decomposition?
- (a)  $Li_2O_2 + CO$
  - (b)  $Li_2O + CO$
  - (c)  $Li_2O_2 + CO_2$
  - (d)  $LiO_2 + CO$
24. Boric acid is an acid because its molecule
- (a) contains replaceable  $H^+$  ion
  - (b) gives up a proton
  - (c) accepts  $OH^-$  from water releasing proton
  - (d) combines with proton from water molecule

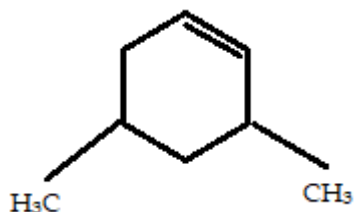
25. Catenation i.e., linking of similar atoms depends on size and electronic configuration of atoms. The tendency of catenation in group 14 elements follows the order:

- (a)  $C < Si > Ge > Sn$
- (b)  $C > Si > Ge \approx Sn$
- (c)  $Si > C > Sn > Ge$
- (d)  $Ge > Sn > Si > C$

26. How much of Sulphur is present in an organic compound if 0.53 g of compound gave 1.158g of  $BaSO_4$  on analysis?

- (a) 10%
- (b) 15%
- (c) 20%
- (d) 30%

27. The IUPAC name of the compound shown below is



- (a) 3,5-Dimethylcyclohexene
- (b) 1,5-Dimethyl-3-cyclohexene
- (c) 1,5-Dimethyl-5-cyclohexene
- (d) 1,3-Dimethyl-5-cyclohexene

28. Positive inductive effect is shown by

- (a)  $-CH_3$
- (b)  $-Br$
- (c)  $-Cl$
- (d)  $-NO_2$

29. Reaction of  $HBr$  with propene in the presence of peroxide gives

- (a) iso-propyl bromide
- (b) 3-bromo propane
- (c) allyl bromide
- (d) n-propyl bromide

30. Which of the following reagent can distinguish between 1-butyne and 2-butyne?

- (a) Aqueous  $NaOH$
- (b) Bromine water
- (c) Fehling's solution
- (d) Ammoniacal  $AgNO_3$

31. The gas that is not considered as a "greenhouse gas" is

- (a)  $\text{CO}_2$
- (b)  $\text{CH}_4$
- (c)  $\text{O}_2$
- (d)  $\text{O}_3$

32. In a close packed cubic structure, the anions (B) occupy the lattice and the cation (A) fit into alternate tetrahedral voids. Formula of the compound is

- (a)  $\text{AB}_2$
- (b)  $\text{A}_2\text{B}$
- (c)  $\text{AB}$
- (d)  $\text{AB}_4$

33. Silicon doped with arsenic is an example of

- (a) intrinsic semiconductor
- (b) p-type semiconductor
- (c) n-type semiconductor
- (d) non-conductor

34. An aqueous solution freezes at  $-0.186^\circ\text{C}$  what is the elevation in boiling point?

( $k_f=1.86$   $k_b=0.512$ )

- (a) 0.186
- (b) 0.152
- (c) 0.0512
- (d) 0.86

35. If 3g of glucose (mol.wt.180) is dissolved in 60g of water at  $15^\circ\text{C}$ , the osmotic pressure of the solution will be

- (a) 3.4 atm
- (b) 0.65 atm
- (c) 6.57 atm
- (d) 5.57 atm

36. When a silver cup is plated with silver by passing 482.5C of electricity, the amount of silver deposited is

- (a) 5.039g
- (b) 50.39g
- (c) 0.539 g
- (d) 0.05039 g

37. Specific conductance of  $0.02M$   $KCl$  is  $0.0022 \text{ Scm}^{-1}$ , its molar conductance is
- (a) 44
  - (b) 110
  - (c) 0.11
  - (d) 9.09
38. The rate of reaction between A and B increased by a factor of 100, when the concentration of A is increased 10 folds. The order of the reaction with respect to A is
- (a) 10
  - (b) 1
  - (c) 4
  - (d) 2
39. 75% of a first order reaction was completed in 32 minutes, when was 50% of the reaction completed?
- (a) 16 minutes
  - (b) 24 minutes
  - (c) 8 minutes
  - (d) 4 minutes
40. Among the electrolytes  $\text{Na}_2\text{SO}_4$ ,  $\text{CaCl}_2$ ,  $\text{Al}_2(\text{SO}_4)_3$  And  $\text{NH}_4\text{Cl}$  the most effective coagulating agent for  $\text{Sb}_2\text{S}_3$  sol is
- (a)  $\text{Na}_2\text{SO}_4$
  - (b)  $\text{CaCl}_2$
  - (c)  $\text{Al}_2(\text{SO}_4)_3$
  - (d)  $\text{NH}_4\text{Cl}$
41. Which of the following is incorrect regarding physisorption?
- (a) It occurs because of van der Waal's forces
  - (b) More easily liquefiable gases are adsorbed readily
  - (c) Under high pressure, it results into multimolecular layer on adsorbent surface
  - (d) Enthalpy of adsorption is low and positive
42. Zone refining method has been employed for preparing ultra-pure sample of
- (a) Copper
  - (b) Zinc
  - (c) Germanium
  - (d) Silver
43. Extraction of zinc from zinc blende is achieved by:
- (a) electrolyte reduction
  - (b) roasting followed by reduction with carbon
  - (c) roasting followed by reduction with another metal
  - (d) roasting followed by self-reduction

44. Acidified potassium dichromate is treated with  $H_2S$ . In this reaction the oxidation number of Chromium
- increases from +3 to +6
  - decrease from +6 to +3
  - decreases from +6 to +4
  - increases from +4 to +6
45. Which gas is most soluble in water?
- He
  - Ne
  - Ar
  - Xe
46. Strongest base among  $NH_3$ ,  $PH_3$ ,  $AsH_3$  and  $SbH_3$  is
- $NH_3$
  - $PH_3$
  - $AsH_3$
  - $SbH_3$
47. Which of the following bonds is the strongest?
- F-F
  - Cl-Cl
  - I-I
  - Br-Br
48. Which of the following oxidation state is common for all lanthanoids?
- +2
  - +3
  - +4
  - +5
49. The electronic configuration of gadolinium ( $Z=64$ ) is:
- $[Xe]4f^85d^16s^2$
  - $[Xe]4f^75d^16s^2$
  - $[Xe]4f^35d^56s^2$
  - $[Xe]4f^65d^26s^2$
50. When 1 mole  $CrCl_3 \cdot 6H_2O$  is treated with excess of  $AgNO_3$ , 3 moles of  $AgCl$  are obtained. The formula of the complex is:
- $[CrCl_3(H_2O)_3] \cdot 3H_2O$
  - $[CrCl_2(H_2O)_4] \cdot 2H_2O$
  - $[CrCl_3(H_2O)_5] \cdot 2H_2O$
  - $[Cr(H_2O)_6]Cl_3$



51. Which is a bidentate ligand?

- (a) Cyano
- (b) Hydronium
- (c) Oxalato
- (d) EDTA

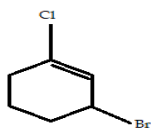
52. The compound of  $[\text{PtCl}_2(\text{NH}_4)]\text{Br}_2$  and  $[\text{PtBr}_2(\text{NH}_3)_4]\text{Cl}_2$  constitutes a pair of

- (a) Coordination isomers
- (b) Linkage isomers
- (c) Ionisation isomers
- (d) Optical isomers

53. Compound 'A' reacts with alcoholic KOH to yield compound 'B' which on ozonolysis followed by reaction with  $\text{Zn} / \text{H}_2\text{O}$  gives methanal and propanal. Compound 'A' is

- (a) 1-propanol
- (b) 1-butanol
- (c) 1-chlorobutane
- (d) 1-chloropentane

54. The IUPAC name of the compound shown below is



- (a) 3-bromo-1-chlorocyclohex-1-ene
- (b) 6-bromo-2-chlorocyclohex-1-ene
- (c) 1-bromo-3-chlorocyclohex
- (d) 1-bromo-5-chlorocyclohex-5-ene

55. In Lucas test an alcohol reacts immediately and gives insoluble chloride. The alcohol is

- (a)  $\text{CH}_3\text{OH}$
- (b)  $\text{CH}_3\text{CH}_2\text{OH}$
- (c)  $(\text{CH}_3)_2\text{CHOH}$
- (d)  $(\text{CH}_3)_3\text{COH}$

$\text{RCH}_2\text{CH}_2\text{OH}$  can be converted to  $\text{RCH}_2\text{CH}_2\text{COOH}$  by the following sequence of steps

- (a)  $\text{PBr}_3, \text{KCN}, \text{H}_3\text{O}^+$
- (b)  $\text{PBr}_3, \text{KCN}, \text{H}_2 / \text{Pt}$
- (c)  $\text{KCN}, \text{H}_3\text{O}^+$
- (d)  $\text{HCN}, \text{PBr}_3, \text{H}_3\text{O}^+$

56. Which of the following, compounds is the reactant in Rosenmund's reduction?

- a.  $\text{CH}_3\text{CO}_2\text{H}$
- b.  $\text{CH}_3\text{CHO}$
- c.  $\text{CH}_3\text{CH}_2\text{Cl}$
- d.  $\text{CH}_3\text{COCl}$

57. The acid which contains the aldehyde group is

- a. acetic acid
- b. formic acid
- c. benzoic acid
- d. propionic acid

58. When aqueous solution of benzene diazonium chloride is boiled, the product formed is

- (a)  $\text{C}_6\text{H}_5\text{CH}_2\text{OH}$
- (b)  $\text{C}_6\text{H}_6 + \text{N}_2$
- (c)  $\text{C}_6\text{H}_5\text{COOH}$
- (d)  $\text{C}_6\text{H}_5\text{OH}$

60.  $\alpha - D(+)$  - glucose and  $\beta - D-(+)$  - glucose are

- (A) Conformers
- (B) Epimers
- (C) Anomers
- (D) Enantiomers