DCE - 2007

CHEMISTRY — MEMORY BASED QUESTIONS

1. Air contains 20% O_2 for the reaction $C_2H_5NH_2 + O_2 \longrightarrow CO_2 + NO_2 + H_2O$. How much volume of air will be required for 1 mol of $C_2H_5NH_2$

(a) 106.4 L (b) 1064 L (c) 212.8 L (d) 2128 L

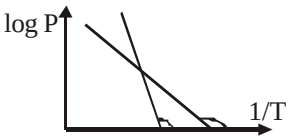
Sol: Ans [b]

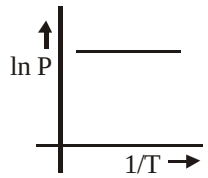
2. Oxide of Mn contains 70% of Mn formula of this oxide will be

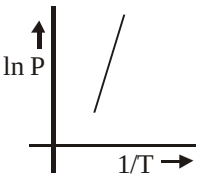
(a) Mn_2O_3 (b) MnO (c) Mn_3O_2 (d) Mn_2O

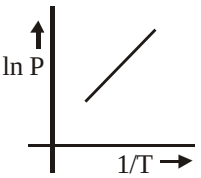
Sol: Ans [a]

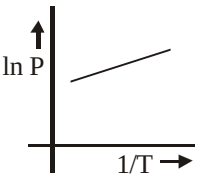
3. Following is the curve log P Vs. 1/T for which curve ΔH is more



(a) 

(b) 

(c) 

(d) 

Sol: Ans [b]

4. Which one is chain-growth polymers

(a) Teflon (b) Nylon-6 (c) Nylon-66 (d) Bakelite

Sol: Ans [a]

5. Which is likely to show inert-pair effect

(a) K (b) Mg (c) Al (d) Pb

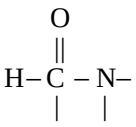
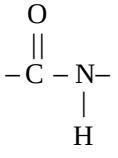
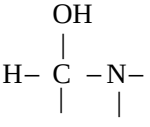
Sol: Ans [d]

6. Which one is basic dye

(a) orange-I (b) phenolphthalein (c) anthroquinone (d) aniline yellow

Sol: Ans [d]

7. Which one is the correct representation of peptide bond

(a) 
(b) 
(c) 
(d) none of these

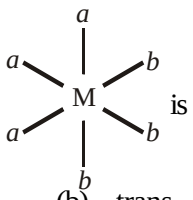
Sol: Ans [b]

8. N_2 accept e^- and convert into N_2^-, where this e^- goes?

(a) antibonding π molecular orbital (b) bonding π molecular orbital

(c) σ bonding molecular oribital (d) σ anti-bonding molecular oribital

Sol: Ans [a]

9. Octahedral complex  is

(a) cis (b) trans (c) mer (d) fac

Sol: Ans [d]

10. A substance under goes nuclear decomposition for its mean-time period ratio of original substance Vs. remaining substance will be

(a) 1 : 0.72 (b) 1 : 0.50 (c) 1 : 0.62 (d) 1 : 0.30

Sol: Ans [a]

11. C_2H_5OH and C_6H_5OH can be distinguished by

(a) $Br_2 + H_2O$ (b) $FeCl_3$ (c) $Br_2 + NaOH$ (d) both (b) and (c)

Sol: Ans [d]

12. $X + KCN \longrightarrow CH_3CN \xrightarrow{2H_2/Ni} CH_3CH_2NH_2$, what is (X)

(a) CH_3CH_2Cl (b) CH_3Cl (c) $CH_3CH_2CH_2Cl$ (d) $(CH_3)_2CHCl$

Sol: Ans [b]

13. For a reaction ΔH = (+ 3 KJ), ΔS = (+10 J/K) beyond which temperaute this reaction will be spontaneous

(a) 300 K (b) 200 K (c) 273 K (d) 373 K

Sol: Ans [a]

14. Solubility of $Al(OH)_3$ = S, Ksp will be

(a) 108 S^3 (b) 27 S^3 (c) 4 S^4 (d) 27 S^4

Sol: Ans [d]

15. Oxidation states of X, Y, Z are + 2, + 5 and – 2 respectively. Formula of the compound formed by these will be

(a) X_2YZ_6 (b) XY_2Z_6 (c) XY_5 (d) X_3YZ_4

Sol: Ans [b]

16. For a crystal system a = b = c and $\alpha = \beta = \gamma \neq 90°$

(a) tetragonal (b) hexagonal (c) rhomohedral (d) monoclinic

Sol: Ans [c]

17. At temperature 327° C and concentration C osmotic pressure of a solution is P, the same solutions at concentration C/2 and a temperature 427° C shows osmotic pressure 2 atm, value of P will be

(a) $\frac{12}{7}$P (b) $\frac{24}{7}$ P (c) $\frac{6}{5}$ P (d) $\frac{5}{6}$P

Sol: Ans [b]

18. Which one is ***not correct***

(a) rate of zero order reaction depends upon initial concentration of reactant

(b) rate of zero order reaction does not depend upon initial concentration of reactant

(c) $t_{1/2}$ of first order reaction is indepenent of initial concentration of reactant

(d) $t_{1/2}$ of zero order reaction is dependent of initial concentration of reactant

Sol: Ans [a]

19. Molar conductance of electrolytic solution Λ_m is

(a) $\propto l$ (b) $\propto (1/A)$ (c) $\propto (1/C)$ (d) $\propto (\sqrt{C})$

Sol: Ans [c]

20. In Adsorption rate of physisorption increases when

(a) temperature is decreased (b) temperature is increased

(c) pressure is decreased (d) none of these

Sol: Ans [a]

21. In two vessels of 1 litre each at the same temperature 1 g of H_2 and 1 g of CH_4 are taken, for these

(a) V_{rms} values will be same (b) kinetic energy per/mole will be same

(c) total kinetic energy will same (d) pressure will be same

Sol: Ans [b]

22. $CH_3CH_2CONH_2 \xrightarrow{X} CH_3CH_2CH_2NH_2$, X is

(a) Pt/H_2 (b) Ni/H_2 (c) $LiAlH_4$ (d) Zn

Sol: Ans [c]

23. In SiF_6^{2-} and $SiCl_6^{2-}$ which one is known and why

(a) SiF_6^{2-} because of small size of F (b) SiF_6^{2-} because of large size of F

(c) $SiCl_6^{2-}$ because of small size of Cl (d) $SiCl_6^{2-}$ because of large size of Cl

Sol: Ans [a]

24. Which reaction is not valid

(a) $HCl + F_2 \longrightarrow HF + Cl_2$ (b) $HF + Cl_2 \longrightarrow F_2 + HCl$

(c) $Zn + HCl \longrightarrow ZnCl_2 + H_2$ (d) $Al + HCl \longrightarrow AlCl_3 + H_2$

Sol: Ans [b]

25. Which one of the following exist in the oxidation state other than +3

(a) B (b) Al (c) Ce (d) Ga

Sol: Ans [c]

26. Write the IUPAC name of $CH_3 - O - \underset{\underset{CH_3}{|}}{CH} - CH_2 - CH_3$

(a) 3-methoxy butane (b) 2-methoxy butene

(c) 3-methyl-3-methoxy propane (d) butoxy methane

Sol: Ans [b]

27. Increase order of basic nature in aqous solutions

(a) $C_6H_5NH_2 > NH_3 > CH_3NH_2 > (CH_3)_2NH$

(b) $NH_3 > C_6H_5NH_2 > CH_3NH_2 > (CH_3)_2NH$

(c) $(CH_3)_2NH > CH_3NH_2 > NH_3 > C_6H_5NH_2$

(d) $CH_3NH_2 > (CH_3)_2NH > NH_3 > C_6H_5NH_2$

Sol: Ans [c]

28. Under certain thermodynamic conditions atomic wt of oxygen is 16.7, it contains two isotopes $^{16}_{8}O$ and $^{17}_{8}O$. Percentage $^{17}_{8}O$ isotopes is

(a) 50 (b) 60 (c) 70 (d) 80

Sol: Ans [c]

29. 40% by weight solution will contain how much mass of the solute in 1 litre solution, density of the solution is 1.2 g/ml

(a) 480 g (b) 48 g (c) 38 g (d) 380 g

Sol: Ans [a]

30. Which one is ***correct***

(a) molality changes with temperature (b) molality does not change with temperature

(c) molarity does not change with temperature (d) normality does not change with temperature

Sol: Ans [b]

31. Which one is ***correct*** statements

(a) basicity of H_3PO_4 and H_3PO_3 is 3 and 3 respectively

(b) acidity of H_3PO_4 and H_3PO_3 is 3 and 3 respectively

(c) acidity of H_3PO_4 and H_3PO_3 is 3 and 2 respectively

(d) basicity of H_3PO_4 and H_3PO_3 is 3 and 2 respectively

Sol: Ans [d]

32. Correct order of decreasing thermal stability is as

(a) $NH_3 > PH_3 > AsH_3 > SbH_3$ (b) $PH_3 > NH_3 > AsH_3 > SbH_3$

(c) $AsH_3 > PH_3 > NH_3 > SbH_3$ (d) $SbH_3 > AsH_3 > PH_3 > NH_3$

Sol: Ans [a]

33. $CaC_2 + H_2O \longrightarrow X \xrightarrow{O_3/H_2O/H^+} HCOOH + HCOOH$, X is

(a) C_2H_4 (b) C_2H_2 (c) C_2H_6 (d) $Ca(OH)_2$

Sol: Ans [b]

34. $C_6H_5MgBr + O_2 \xrightarrow{heat} X$, X is

(a) C_6H_6 (b) $C_6H_5OC_6H_5$ (c) C_6H_5OMgBr (d) C_6H_5CHO

Sol: Ans [c]

35. Which of the following indicates open chain structure of glucose

(a) penta-acylate derivative of glucose (b) cyano hydrin formation with HCN

(c) reaction with Fehling solution (d) reaction with Tollen's reagent

Sol: Ans [a]

36. CH_3COCH_3 and CH_3CH_2CHO can be distinguished by

(a) $FeCl_3$ (b) Tollen's reagent (c) $NaHSO_3$ (d) 2, 4-DNP

Sol: Ans [b]

37. On heating a vessel initially at 300 K to 400 K fraction of volume spilled-over

(a) 3/4 (b) 2/4 (c) 1/4 (d) 1/5

Sol: Ans [a]

38. Which do not decolourise $KMnO_4$ aq. solution

(a) $C_2O_4^{2-}$ (b) HSO_3^- (c) CO_3^{2-} (d) SO_3^{2-}

Sol: Ans [c]

39. Which increases on increase of temperature

(a) energy of activation (E_a) (b) collision frequency (Z)

(c) rate constant (k) (d) both (b) and (c)

Sol: Ans [d]

40. Which expression is wrong for first order reaction

(a) $k = \frac{2.303}{t}\log\left(\frac{A_0}{At}\right)$ (b) $k = \frac{t}{2.303}\log\left(\frac{A_0}{At}\right)$

(c) $-k = \frac{t}{2.303}\log\left(\frac{At}{A_0}\right)$ (d) rate = k [A]

Sol: Ans [b]

41. Chloramphenicol is

(a) narrow spectrum antibiotic (b) broad spectrum analgesic

(c) broad spectrum antibiotic (d) broad spectrum antibacterial

Sol: Ans [c]

42. Which one of the following is most basic

(a) FCH_2NH_2 (b) $FCH_2CH_2NH_2$ (c) $C_6H_5NH_2$ (d) $C_6H_5CH_2NH_2$

Sol: Ans [d]

43. Which is not the property of ethanenitrile (CH_3CN)

(a) undergoes acidic hydrolysis to give carboxylic acid

(b) undergoes alkaline hydrolysis to give salt of carboxylic acid

(c) it tautomerises to give methyl iso-cyanide

(d) it gives carbylamine reaction with chloroform

Sol: Ans [d]