CLUSTER UNIVERSITY SRINAGAR

University Entrance Examination

Integrated Chemistry (50 x 1= 50 MARKS) Time One Hour

Note: Each wrong answer will lead to the deduction of 0.25 marks from the total score of the candidate.

1. The pH of 0.001M NaOH solution is

   A. 2 B. 3 C. 11 D. 14

2. The increasing order of acidity of oxides of chromium

   A. $CrO_3 < Cr_2O_3 < CrO$ B. $Cr_2O_3 < CrO < CrO_3$

   C. $CrO_3 < CrO < Cr_2O_3$ D. $CrO < Cr_2O_3 < CrO_3$

3. The most ionic halide is

   A. BiF_3 B. AsF_3 C. PBr_3 D. NCl_3

4. The IUPAC name of $[Co(NH_3)_4Cl_2]Cl$ is

   A. tetramminodichloridocobalt(I)chloride. B. tetrachloridodiaraminecobalt(III)chloride.

   C. cobaltdichloridotetramminechloride. D. tetraamminedichloridocobalt(III)chloride.

5. For the reaction $CH_3\text{-}C{\equiv}CH + HBr \xrightarrow{X} \xrightarrow[Y.]{HBr/Peroxide}$ 'Y' is

   A. $CH_3\text{-}CBr_2\text{-}CH_3$ B. $CH_3\text{-}CH_2\text{-}CHBr_2$

   C. $CH_3\text{-}CHBr\text{–}CH_2Br$ D. $CH_2Br\text{-}CH_2\text{-}CH_2Br$

6. Which of the following can't give +vehaloform test.

   A. CH_3CH_2OH B. $CH_3 - CH_2 - CHO$

   C. $CH_3 - CO - CH_3$ D. $CH_3 - CHOH - CH_3$

7. The IUPAC name of $CH_3\text{–}\underset{\displaystyle OH}{\underset{|}{CH}}\text{–}CH_2\text{–}CH_2\text{–}\underset{\displaystyle Br}{\underset{|}{CH}}\text{–}CHO$ is

   A. 2-hydroxy-5-bromo-6-hexanal B. 2-hydroxy-5-bromo-5-pentanal

   C. l-bromo-4-hydroxypentanal D. 2-bromo-5-hydroxy-l-hxanal

8. Amides can be converted into primary amines by

   A. Hoffmann's bromomide reaction B. Sandmeyer's reaction

   C. Carbylamine reaction D. Dehydration reaction.

9. Which of the following does not undergo Cannizzaro reaction

   A. Chloral B. Formaldehyde C. Acetaldehyde D. Benzaldehyde

10. An organic compound decolourises alkaline $KMnO_4$& gives red ppt. with ammonical Cu_2Cl_2, the compound is

    A. 2-butyne B. 2-butene C. propyne D. all of these

11. Which of the following is most volatile?

    A. HF B. HCl C. HBr D. HI

12. $(n-1)d^{10}ns^2$ is general electronic configuration for

A. Sc,Y,La B. Fe,Co.Ni C. Cu,Ag,Au D. Zn,Cd,Hg

13. Which of the following ion can show colour in aqueous state?

A. Cu^+ B. Sc^{3+} C. Ti^{4+} D. Co^{3+}

14. The oxidation state of iron in $[Fe(H_2O)_5NO]SO_4$ is

A. 0 B. 1 C. 2 D. 3

15. The following reaction can be an example of $3XO^- \longrightarrow XO_3^- + 2X^-$

A. Reduction B. Oxidation

C. Disproportionation D. Hydrolysis

16. Which of the following ion has a pyramidal structure?

A. NO_3^- B. CO_3^{2-} C. CH_3^- D. SO_4^{2-}

17. $CH_3 - C\equiv CH + 2HC1 \longrightarrow X \xrightarrow{NaOH(aq)} Y \xrightarrow[-H_2O]{} Z$. 'Z' is

A. Propylidene Chloride B. Isopropylidene C. Acetaldehyde D. Acetone

18. The conjugate base of NH_3 is?

A. NH_4^+ B. NH_2^- C. NH^{2-} D. NH_4Cl

19. Prussian blue is formed by the reaction of Potassium ferrocyanide with

A. Cu^{2+} ions B. Fe^{3+} ions C. Cd^{2+} D. Na^+ ions

20. A substance which reacts with gangue to form fusible material which floats at the molten metal is called

A. Ore B. Flux C. Matte D. Slag

21. Mac-Arthur Forrest Cyanide process is used for the extraction of

A. Cu B. Au C. Cr D. Al

22. The correct statement regarding ZnO is

A. It is amphoteric B. It forms $ZnCl_2$ with HCl

C. It forms Na_2ZnO_2 with NaOH D. All of these

23. Zinc blende (ZnS) is concentrated by

A. Froth floatation process B. Magnetic separation

C. Leaching D. Washing with water

24. The amount of NaCl, $MgCl_2$& $AlCl_3$ required to coagulate a fixed amount of As_2S_3 sol vary in the order of

A. NaCl> $MgCl_2$ > $AlCl_3$ B. MaCl< $MgCl_2$ < $AlCl_3$

C. NaCl> $MgCl_2$ < $AlCl_3$ D. NaCl< $MgCl_2$ > $AlCl_3$

25. In Caro's acid (H_2SO_5), the oxidation state of Sulphur is

A. +8 B. +6 C. +4 D. None of these

26. The half life of zero order reaction is

A. directly proportional to initial concentration of reactants.

B. inversely proportional to initial concentration of reactants.

C. independent of initial concentration of reactants.

D. directly proportional to time.

27. For a chemical reaction $X + 2Y \longrightarrow$ Products; Rate = k $[X][Y]^2$

If concentration of X is double & concentration of Y is halved, the rate of reaction becomes

A. 8 times B. l/2 times C. l/4 times D. 2 times

28. The acid hydrolysis of the following reaction is an example of

$$CH_3COOC_2H_5(l) + H_2O\ (l) \xrightarrow{H^+} CH_3COOH(l) + C_2H_4OH(l)$$

A. Firstorder reaction B. Second order reaction

C. Pseudo-unimolecular reaction D. Pseudounimolecular 2nd order reaction

29. The heat of combustion of CH_4 (g) at constant volume is measured in a bomb calorimeter at 298.2K and is found to be 885389 J mol^{-1}.The value of ΔH is

A. -890.348KJ mol^{-1} B. -885.389KJ mol^{-1}

C. +890.348KJ mol^{-1} D. +885.389KJ mol^{-1}

30. The halogen atoms having highest electron affinity and highest oxidizing power are

A. Fluorine & Chlorine B. Bromine & Fluorine

C. Chlorine & Fluorine D. Fluorine & Bromine

31. The number of moles of electrons taken up when one mole of NO_3^- ions is reduced to 1 mole of NH_2OH is

A. 2 B. 4 C. 6 D. 8

32. Which atom contains an electron with quantum numbers: n = 3, 1 = 2, m = 0, s = + 1/2

A. K B. Cl C. Ne D. Co

33. The total No. of orbitals in a shell having principal quantum No. 'n' is

A. n B. n + I C. n^2 D. $2n^2$

34. An alkene on treatment with hot alkaline $KMnO_4$ yields acetic acid &butanoic acid, the alkene is expected to be

A. Hexane B. 3-hexene C. 2-hexene D. 2-methyl-2-hexene

35. Orbital angular momentum for 'd' electron is

A. $\frac{h}{2\pi}\sqrt{6}$ B. $\frac{h}{\pi}\sqrt{2}$ C. $\frac{h}{\pi}\sqrt{8}$ D. $\frac{h}{2\pi}\sqrt{2}$

36. $CH_3 - CH_2 - COOH \xrightarrow[-HCl]{Cl_2/Red\ P} CH_3 - CCl_2 - COOH$. The reaction is called as

A. Wolf-Kishner reaction B. Balz-Schiemann's reaction

C. Hell Volhard-Zelinksky (HVZ) reaction D. Rosenmund's reaction

37. A group which deactivates benzene ring towards electrophilic substitution but directs the incoming group principally to the O- & p- positions is

A. $-C_2H_5$ B. -CHO C. -Cl D. $-NO_2$

38. In Shottky defect the missing ion from the crystal lattice can be

A. cation B. anion C. bothcation & anion D. none of these

39. Base catalysedaldol condensation is not possible with

A. Propionaldehyde B. 2-Methylpropionaldehyde

C. 2,2-Dimethylpropionaldehyde D. Acetaldehyde

40. Carmizzaro reaction is given by

A. Trimethylacetaldehyde B. Formaldehyde C. Benzaldahyde D. All of these

41. An organic compound on passing over Cu at 300°C gives an alkene. The compound can be

A. alkane B. alkene C. rectified spirit D. tert. alcohol

42. What will be the e.m.f of the cell when the reduction potential of half cells is

$Mg^{2+}(aq) + 2e^- \longrightarrow Mg(s)$; $E° = -2.37V$

$Cu^{2+}(aq) + 2e^- \longrightarrow Cu(s)$; $E° = +0.34V$

A. 2.7IV B. 2.03V C. -2.71V D. -2.03V

43. 200 ml of 0.2M HCl is mixed with 300 ml of O.1M NaOH, the amount of heat released can be

A. 57.1KJ mol^{-1} B. 1.71KJ mol^{-1} C. 5.714KJ mol^{-1} D. 11.2KJ mol^{-1}

44. Which of the following solutions show highest boiling point?

A. O.IM NaCl B. O.IM $La_2(SO_4)_3$

C. O.IM $BaCl_2$ D. All have same boiling point.

45. The amount of KCl needed for one Kg of water so that its freezing point is depressed by 3K is?

A. 0.806 mol B. 1.62 mol C. 0.405 mol D. 2.43 mol

46. A unimolar solution of each electrolyte like $AgNO_3$, $Cu(NO_3)_2$, $Mg(NO_3)_2$& $Hg_2(NO_3)_2$ is being electrolysed by using inert electrodes. The standard electrode potentials in volts are Ag/Ag^+ = 0.80V, Mg/Mg^{2+} = -2.37V, Cu/Cu^{2+}= +0.34V & Hg/Hg^{2+}= +0.79 V. With increasing voltage, the sequence of deposition of metals on the cathode will be

Cl_2/Red P
−HCl

A. Mg, Cu, Hg, Ag B. Ag, Hg, Cu, Mg C. Ag, Hg, Cu D. Cu, Hg, Ag

47. Bordeaux mixture is

A. $CuSO_4$ soln. + lime B. $CuSO_4$ + C C. $CuSO_4$ + CaO D. $CuSO_4$ alone

48. Identify 'Y' in the following reaction $C_6H_5NH_2 \xrightarrow[273K]{NaNO_2/HCl} X \xrightarrow[300K]{H^+/H_2O} Y$

A. C_6H_5Cl B. C_6H_5OH C. $C_6H_5N_2Cl$ D. C_6H_5NHO

49. Which of the following relation is correct for electron affinity of a halogen 'X'?

A. $X_2(g) + 2e^- \longrightarrow 2X^-(g)$ B. $\frac{1}{2} X(q) + e^- \longrightarrow X^-(g)$

C. $\frac{1}{2} X(g) + e^- \longrightarrow X(g)$ D. $X(g) + e^- \longrightarrow X^-(g)$

50. The increasing order of acidity in CH_4, NH_3, H_2O & HF is

A. $CH_4 < NH_3 < H_2O < HF$ B. $NH_3 < CH_4 < H_2O < HF$

C. $NH_3 < H_2O < CH_4 < HF$ D. $H_2O < NH_3 < CH_4 < HF$

KEY

1	**3**	**26**	**1**
2	**4**	**27**	**2**
3	**1**	**28**	**3**
4	**4**	**29**	**1**
5	**3**	**30**	**3**
6	**2**	**31**	**3**
7	**4**	**32**	**4**
8	**1**	**33**	**3**
9	**3**	**34**	**3**
10	**3**	**35**	**1**
11	**2**	**36**	**3**
12	**4**	**37**	**3**
13	**4**	**38**	**3**
14	**2**	**39**	**3**
15	**3**	**40**	**4**
16	**3**	**41**	**4**
17	**4**	**42**	**1**
18	**2**	**43**	**2**
19	**2**	**44**	**2**
20	**2**	**45**	**1**
21	**2**	**46**	**3**
22	**4**	**47**	**1**
23	**1**	**48**	**2**
24	**1**	**49**	**4**
25	**2**	**50**	**1**