

**HIGHER SECONDARY SECOND YEAR**  
**■ KALVISOLAI ■ MODEL QUESTION PAPER - CHEMISTRY**

**PART - I**

Maximum Marks: 150

30x1=30

*Note: i) Answer all the questions. ii) Choose and write the correct answer.*

1. The intramolecular Hydrogen bonding is present in  
A) o - nitrophenol                      B) m - nitrophenol  
C) p - nitrophenol                      D) p - hydroxy benzaldehyde
2. The type of Hybridisation in  $\text{BrF}_5$   
A)  $sp^3$               B)  $sp^3d^2$               C)  $dsp^3$               D)  $sp^3d$
3. When  $X_A \gg X_B$ , A - B bond is  
A) polar covalent                      B) Non - polar covalent  
C) Ionic                                  D) metallic
4. Electronic configuration of 14<sup>th</sup> group element is  
A)  $ns^2np^2$               B)  $ns^1np^1$               C)  $ns^1np^2$               D)  $ns^2np^1$
5. Which of the following has maximum number of unpaired electrons  
A)  $\text{Ni}^{2+}$               B)  $\text{Ti}^{3+}$               C)  $\text{V}^{3+}$               D)  $\text{Fe}^{2+}$
6. The role of aluminium in aluminothermic process is  
A) an oxidising agent              B) a reducing agent              C) dehydrating agent              D) a catalyst
7. Maximum oxidation state exhibited by Lanthanide is  
A) +1              B) +2              C) +3              D) +4
8. The oxides of Lanthanides used in gas lamp materials are  
A)  $\text{CeO}_2$  and  $\text{NdO}_2$               B)  $\text{CeO}_2$  and  $\text{ThO}_2$   
C)  $\text{ThO}_2$  and  $\text{SmO}_2$               D)  $\text{LnO}_2$  and  $\text{CeO}_2$
9. The name of  $[\text{Pt}^{\text{IV}}(\text{NH}_3)_2\text{Cl}_2]^{2+}$  is  
A) Diammine dichloro platinum (IV) ion              B) Diammine dichloro platinum (IV)  
C) Diammine dichloro platinum              D) Dichloro diammine platinum (IV)
10. In the nuclear reaction  ${}_{93}^{238}\text{U} \longrightarrow {}_{82}^{206}\text{Pb}$  the number of  $\alpha$  and  $\beta$  particles emitted are  
A)  $7\alpha, 5\beta$               B)  $6\alpha, 4\beta$               C)  $4\alpha, 3\beta$               D)  $8\alpha, 6\beta$
11. In a simple cubic cell, each point on a corner is shared by  
A) one unit cell              B) two unit cell              C) 8 unit cell              D) 4 unit cell
12. In an adiabatic process which of the following is true  
A)  $q = w$               B)  $q = 0$               C)  $\Delta E = q$               D)  $p \Delta v = 0$
13. In which of the following process, the process is always feasible  
A)  $\Delta H > 0; \Delta S > 0$               B)  $\Delta H < 0; \Delta S > 0$   
C)  $\Delta H > 0; \Delta S < 0$               D)  $\Delta H < 0; \Delta S < 0$
14. For homogeneous gas reaction at 600 K  $4\text{NH}_3(\text{g}) + 5\text{O}_2(\text{g}) \rightleftharpoons 4\text{NO}(\text{g}) + 6\text{H}_2\text{O}(\text{g})$  at equilibrium constant,  $K_c$  has the unit  
A)  $(\text{mol dm}^{-3})^{-1}$               B)  $(\text{mol dm}^{-3})$               C)  $(\text{mol dm}^{-3})^{10}$               D)  $(\text{mol dm}^{-3})^{-9}$
15. The catalyst used in the manufacture of  $\text{SO}_3$  is  
A) moist  $\text{V}_2\text{O}_5$               B) Dry  $\text{V}_2\text{O}_5$               C) porous  $\text{V}_2\text{O}_5$               D) Fe

16. The rate constant for a first order reaction is  $1.54 \times 10^{-3} \text{ Sec}^{-1}$ . Calculate its half-life period.  
A) 400 sec      B) 450 sec      C) 120 sec      D) 1540 sec
17. Fog is a colloidal solution of  
A) gas in liquid      B) liquid in gas      C) gas in solid      D) solid in gas
18. Collidal antimony is used in curing  
A) Malaria      B) Kalazar      C) Janndice      D) Head ache
19. The Magnitude of gaseous adsorption  
A) Temperature      B) Nature of gas      C) Pressure      D) Amount of the adsorbent
20. For the titration between oxalic Acid and sodium Hydroxide the Indicator used is  
A) Potassium permanganate      B) Phenolphthalein      C) Litmus      D) Methyl orange
21. The active component of dynamite is  
A) Kieselgur      B) Nitro glycerine      C) Nitro benzene      D) Trinitro toluene
22. According to Lewis concept of acids and bases ethers are  
A) Neutral      B) Acidic      C) Basic      D) Amphoteric
23. Which reaction is used in Zeisel's method of detection and estimation of alkoxy group  
A) alkyl halide + sodium group  
B) natural products + excess of HI  
C) ethers + oxygen  
D) alcohol + acid
24. The compound used in the preparation of the tranquilizer sulphonal is  
A) acetone      B) acetophenone      C) Isopropyl alcohol      D) glycol
25. The compound which does not undergo inter molecular dehydration with  $\text{P}_2\text{O}_5$  is  
A) Acetic acid      B) Formic acid      C) Propionic acid      D) butyric acid
26. The compound that is most reactive towards electrophilic nitration is  
A) Toluene      B) benzene      C) benzoic acid      D) nitrobenzene
27. Sulpha drugs are prepared from  
A) methylamine      B) aniline      C) benzylamine      D) N,N dimethylamine
28. IUPAC name of methyl cyanide is  
A) methane nitrile      B) aceto nitrile      C) ethane nitrile      D) cyano methane
29. The secondary structure of proteins refers to  
A) Sequence of amino acids      B)  $\alpha$  (or)  $\beta$  Helical structure  
C) nucleic acids      D) lipids
30. D (+) glucose and D (-) Fructose are ..... isomers  
A) optical      B) geometrical      C) position      D) Functional

**PART - II**

**Note: i) Answer any fifteen questions.**

**ii) Each answer should be in one or two sentences.**

15x3=45

31. Explain the significance of negative electronic energy.
32. The experimental value of  $d(\text{C} - \text{Cl})$  is  $1.76 \text{ \AA}$  what is the atomic radius of carbon? ( $r_{\text{Cl}} = 0.99 \text{ \AA}$ )

33. Why do d-block elements exhibit variable oxidation state?
34. What is meant by Spitting of Silver? How can it be prevented?
35. Prove that  $P_2O_5$  is a powerful dehydrating agent.
36. Write any three uses of lead.
37. Determine the average life of  $U^{238}$  having  $t_{1/2} = 140$  days.
38. write a short note on metallic crystals.
39. State le chatelier's principle.
40. What is the Entropy change of an Engine that operates at  $100^\circ C$  when  $453.6$  K. Cal of heat is supplied to it.
41. Write the Arrhenius equation and explain the terms.
42. Show that half-life period of a first order reaction independent of initial concentration.
43. What is an auto catalyst? Give an example.
44. What is common ion effect?
45. What is racemic mixture? Give an example.
46. Write the dye Test for phenol.
47. How does glycerol react with  $KHSO_4$ ?
48. How is acetophenone prepared by Friedel - crafts reaction?
49. What happens when Acetic acid is treated with Bromine in the presence of Phosphorous Tri Bromide?
50. An aromatic simplest nitro compound A on reduction using  $LiAlH_4$  gives B. B undergoes carbylamine reaction. what are A and B? What is the other name of A?
51. What are antiparasitics? Give an example.

**PART - III**

**Note:** Answer any seven questions choosing atleast two questions from each section. 7x5=35

**Section - A**

52. Apply molecular orbital theory to nitrogen molecule.
53. How is zinc extracted from its ore.
54. Give the comparison of Lanthanides and actinides (any five)
55. Explain co-ordination and ionisation isomerism with suitable examples.

**Section - B**

56. Give the characterization of entropy.
57. Apply le - chatelier's principle to obtain the conditions for maximum yield of ammonia in Haber's process.
58. Explain various types of complex reactions and give one example for each.
59. Calculate the standard *e.m.f.* of the cell  
 $Cd, Cd^{2+} // Cu^{2+}, Cu$  and determine the cell reactions, the standard reduction potentials of  $Cu^{2+}$ ,  $Cu$  and  $Cd^{2+}$ , are  $0.34$  volt and  $-0.4$  volt respectively, predict the feasibility of the cell reaction.

**Section - C**

60. Distinguish between aromatic (Anisole) and aliphatic ethers (Diethylether).
61. Explain the mechanism of simple cannizaro's reaction.
62. Convert (i) Ethylene Dibromide into Succinic acid (ii) Cane sugar to Lactic acid
63. Explain briefly on the characteristics of rocket propellants.

**PART - IV**

**Note:i) Question No.70 is compulsory and answer any three from the remaining questions.**

**ii) Answer four questions in all.**

**4x10=40**

64. a. Explain Pauling's method to determine Ionic radii.  
b. How are noble gases separated by Dewar's method?
65. a. Mention the function of Hemoglobin in natural process.  
b. Write a note on radio carbon dating.
66. a. Explain Bragg's spectrometer method.  
b. Write briefly about the preparation of colloids by condensation methods.
67. a. Write a note on applications of Kohlrausch law.  
b. Give the IUPAC conventions for writing cell diagram with suitable example.
68. a. Write a note on chair and boat forms of cyclohexane.  
b. How will you get the following from benzoic acid.  
1. Benzene 2. Benzyl alcohol 3. Ethyl benzoate.
69. a. How is Schiff's base, methyl isocyanide and methyl alcohol obtained from methyl amine.  
b. Explain the biological importance of lipids.
70. a. An organic compound 'A' molecular formula ( $C_2H_6O_2$ ) with conc  $H_2SO_4$  gives B ( $C_4H_8O_2$ ) 'A' on oxidation using  $HIO_4$  gives compound (C) 'A' also heating with anhydrous  $ZnCl_2$  that gives compound (D) ( $C_2H_4O$ ) 'D' undergoes iodoform test. What are A, B, C, D.  
b. Compound 'A' is a powerful oxidising agent and also it is a red orange crystal which melts at  $396^\circ C$ . 'A' reacts with chloride salt and conc.  $H_2SO_4$  to give 'B' which is red orange in colour. A also reacts with an alkali to give 'C' which is yellow in colour. Find out A, B and C. Explain the reactions.  
c. An organic compound A ( $C_7H_6O$ ) has a bitter almond smell with ammonia 'A' gives 'B' ( $C_{21}H_{18}N_2$ ) with aqueous alcoholic KCN. 'A' gives 'C' ( $C_{14}H_{12}O_2$ ). With aromatic tertiary amine 'A' gives 'D'  $C_{23}H_{26}N_2$  what are A, B, C and D Explain the reactions.  
d. Calculate the pH of 0.1M  $CH_3COOH$  solution. Dissociation constant of acetic acid is  $1.8 \times 10^{-5} M$ .

**ALL THE BEST**

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