

DEPARTMENT OF EDUCATION  
CENTRAL TIBETAN ADMINISTRATION, DHARAMSHALA  
ENTRANCE EXAMINATION-2011.

CHEMISTRY

Time : 1 hours

Max. Marks 50.

INSTRUCTIONS:

There are fifty questions in this paper. All the questions are of Multiple Choice type and carry equal marks. Each question is followed by four responses marked (a), (b), (c) and (d). Select the one, which is the best in each case and record it clearly against the question number on the answer sheets provided with the paper.

More than one response indicated against an item or overwriting in the answer sheet would deem as incorrect response and no mark will be granted on that.

Question paper along with the answer sheet of the paper should be returned to the invigilator after the completion of the paper or when the time is over whichever is earlier.

Roll No. \_\_\_\_\_

Marks obtained by the candidate:

\_\_\_\_\_

Signature of Examiner

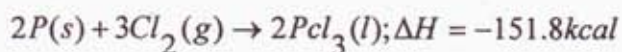
CHEMISTRY-2011

- Q.1. Vulcanisation is heating of natural rubber with sulphur to make it tough which involves:-
- (a) Polymerisation (b) Cross linking of chains with S  
(c) Thermal association (d) Colloidal formation
- Q.2. The ratio of RMS velocity to average velocity of a gas at the same temperature is:
- (a) 1 : 1.086 (b) 1.086 : 1  
(c) 2 : 1.086 (d) 1.086 : 2
- Q.3. Galvanisation is the process in which surface of iron is coated with a layer of \_\_\_\_\_ preventing rust formation.
- (a) Copper (b) Tin  
(c) Chromium (d) Zinc
- Q.4. The correct set of quantum numbers for the unpaired electron of chlorine atom is:-  $n, l, m$
- (a) 2 1 0 (b) 2 1 1  
(c) 3 1 1 (d) 3 0 0
- Q.5. The angular momentum of an electron is  $h/\pi$ . To which orbit, that electron belongs?
- (a) 5 (b) 4  
(c) 3 (d) 2
- Q.6. In which of the following pairs hydrogen-bonding is not possible?
- (a)  $NH_3, NH_3$  (b)  $H_2O, CH_3OCH_3$   
(c)  $NH_3, CH_4$  (d)  $CH_3OH, CH_3OCH_3$
- Q.7. The ratio of RMS velocity to average velocity of a molecule is:-
- (a) 1.28 (b) 0.92  
(c) 1.18 (d) 2

- Q.8. Which will be coloured and paramagnetic among  $Cu^{+1}$  and  $Cu^{+2}$  ions?  
 (a)  $Cu^{+2}$  (b)  $Cu^{+1}$   
 (c) Both (d) Neither of them
- Q.9. By allowing the expansion of compressed  $H_2$  or He at room temperature, No cooling effect is seen instead heating effect takes place. It is due to  
 (a)  $H_2$  and He are ideal gases  
 (b) Room temperature is higher than inversion temperature ( $T_i$ )  
 (c) Room temperature is less than inversion temperature ( $T_i$ )  
 (d)  $H_2$  and He have compressibility factor 0.5
- Q.10. The oxidation number of Ni in  $K_4[Ni(CN)_4]$   
 (a) -2 (b) -1  
 (c) +2 (d) 0
- Q.11. The synthetic polymer among these is  
 (a) rubber (b) starch  
 (c) teflon (d) glucose
- Q.12. The freezing point of an aqueous solution of a non-volatile, non-electrolyte is  $-0.65^{\circ}C$ . The molality of the solution is ( $K_f$  for water = 1.86 deg),  
 (a) 0.70 (b) 0.18  
 (c) 0.35 (d) 1.8
- Q.13. The formation of sodium salicylate from hot sodium phenoxide solution and carbon tetra chloride is known as  
 (a) Etard reaction (b) H.V.Z reaction  
 (c) Reimer - Tiemann reaction (d) Gattermann reaction
- Q.14. The nitro compounds when heated with Zinc powder with ammonium chloride solution results in formation of  
 (a) a primary amine (b) hydroxylamine derivative  
 (c) a azo compound (d) a hydrozo derivative



Q.15. Calculate the heat of formation of  $PCl_5(s)$  from the following data:-



(a)  $-108.7kcal$  (b)  $+108.7kcal$

(c)  $-184.6kcal$  (d)  $+184.6kcal$

Q.16. Which of the following bases is stronger than methylamine?

(a) Trimethylamine (b) Dimethylamine

(c) Benzylamine (d) Cyclohexylamine

Q.17. At 3000K, the equilibrium pressures of  $CO_2$ ,  $CO$  and  $O_2$  are 0.6, 0.4 and 0.2 atmospheres respectively.  $K_p$  for the reaction



(a) 0.088 (b) 0.0533

(c) 0.133 (d) 0.177

Q.18. The alkaline hydrolysis of an ester represented by



(a) first order and bimolecular

(b) second order but not bimolecular

(c) bimolecular but zero order

(d) bimolecular and second order

Q.19. Dalton's law of partial pressure is valid for mixture of:-

(a)  $NO$  and  $O_2$  (b)  $H_2S$  and  $SO_2$

(c)  $SO_2$  and  $O_2$  (d)  $N_2$  and  $CO_2$

Q.20. The weight of  $KMnO_4$  required to prepare 500 mL of a deci-normal solution to be used in dil.  $H_2SO_4$  medium as the oxidizing agent is:-

(a) 1.5 g (b) 3.16 g

(c) 31.6 g (d) 15.89 g

- Q.21. Propanone can be reduced to n-propane using:-  
(a)  $H_2 / Ni$  (b)  $Na / C_2H_5OH$   
(c) P and HI (d)  $Zn / Hg / conc. HCl$
- Q.22. Which is the strongest of the following mineral acids?  
(a)  $HClO_4$  (b)  $H_2SO_4$   
(c)  $HCl$  (d)  $HNO_3$
- Q.23. The set of compounds which can undergo Cannizzaro reaction (auto oxidation and reduction) is:-  
(a)  $CH_3CHO, CH_3COCH_3$   
(b)  $C_6H_5CHO, CH_3CHO$   
(c)  $HCHO, C_6H_5CHO$   
(d)  $C_6H_5COCH_3, C_6H_5CHO$
- Q.24. The acid base indicators used in the titration of  
(i)  $(COOH)_2$  and  $NaOH$   
(ii)  $H_2SO_4$  and  $Na_2CO_3$  are respectively as  
(a) methyl orange, litmus  
(b) phenolphthalein, phenolphthalein  
(c) phenolphthalein, methyl orange  
(d) starch solution, xylene orange
- Q.25. A chemical reaction is at equilibrium when:-  
(a) the rates of forward and backward reactions are equal  
(b) reactions are completely converted into products  
(c) equal amounts of reactants and products are present  
(d) 50% of reactant is converted to products
- Q.26. When 2-ethylanthraquinol solution in a mixture of benzene and cyclohexanol is oxidized with air, the product is  
(a) ethanol (b) hydrogen peroxide  
(c) anthracene (d) ozone

- Q.27. The normality of a 10 volume  $H_2O_2$  solution is:-
- (a) 10 N (b) 0.0303 N  
(c) 30.3 N (d) 1.7 N
- Q.28. The periodic property that decreases along a period is:-
- (a) electronegativity (b) ionization potential  
(c) atomic radii (d) electron affinity
- Q.29. Which of the following compounds is sparingly soluble in ammonia?
- (a)  $AgI$  (b)  $AgBr$   
(c)  $AgCl$  (d)  $Cu_2Cl_2$
- Q.30. Red phosphorus is chemically much less reactive than white phosphorus because
- (a) it has a polymeric structure  
(b) it does not contain tetrahedral  $P_4$  molecules  
(c) it does not contain P – P bonds  
(d) it has a linear structure
- Q.31. Glycerol on heating with  $P_2O_5$  or  $KHSO_4$  gives:-
- (a) acrolein (b) glyoxal  
(c) glyoxalic acid (d)  $CO_2$
- Q.32. Which of the following compounds finds maximum use in photography?
- (a)  $AgCl$  and  $AgOH$  (b)  $AgBr$  and  $Na_2S_2O_3$   
(c)  $AgI$  and  $Na_2SO_4$  (d)  $AgNO_3$  and  $KI$
- Q.33. Lithophone is
- (a)  $ZnS + BaSO_4$  (b)  $BaS + ZnSO_4$   
(c)  $ZnS + CaSO_4$  (d)  $ZnSO_4 + CaS$
- Q.34. The strongest acid among the following is
- (a)  $CH_3COOH$  (b)  $H_2NCH_2COOH$   
(c)  $C_6H_5COOH$  (d)  $HCOOH$



- Q.35. The monomer of PAN (Polyacrylonitrile) is  
 (a)  $CH_2 = CHCN$  (b)  $CF_2 = CF_2$   
 (c)  $CHCl = CH_2$  (d)  $CH_3 - CH = CH_2$
- Q.36. The van't Hoff factor of  $Na_2CO_3$   
 (i) in water and  
 (ii) in benzene are respectively  
 (a) 3 : 1 (b) 1 : 2  
 (c) 0.5 : 1 (d) 1.2 : 0.5
- Q.37. Excess Bromine /  $H_2O$  reacts with phenol to give  
 (a) 2 Bromo Phenol  
 (b) 2, 4, 6 tri bromo phenol  
 (c) Both a & b  
 (d) None of these
- Q.38. Which of the following is false regarding diethyl ether?  
 (a) It does not possess a dipole moment  
 (b) It is completely soluble in water  
 (c) It is soluble in conc.  $H_2SO_4$   
 (d) It is inflammable
- Q.39. Aniline when treated with  $CH_3COCl$  produces  
 (a) Acetanilide (b) O - acetyl aniline  
 (c) p - acetyl aniline (d) None of these
- Q.40. Under the influence of a dilute base two molecules of an aldehyde may condense to form  
 (a) an acid (b) N - hydroxyl aldehyde  
 (c) B - hydroxy ketone (d) an alcohol
- Q.41. Benzaldehyde undergoes benzoin condensation in presence of  
 (a) potassium cyanide (b) conc.  $H_2SO_4$   
 (c) sodium metal (d) anhydrous  $ZnCl_2$

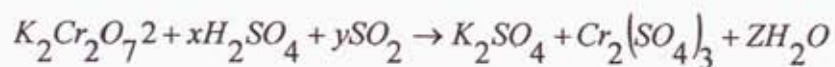
- Q.42. Brownian movement is due to  
(a) convection currents  
(b) attraction and repulsion of the charges of the colloidal particles  
(c) temperature fluctuations in the liquid phase  
(d) impact of molecules of the dispersion medium on the colloidal particles
- Q.43. Starting material for Buna – S rubber is  
(a) butadiene and styrene (b) styrene  
(c) butadiene and isobutylene (d) chloroprene
- Q.44. Which of the following is not iso-electronic with  $O^-$ ?  
(a)  $N^{2-}$  (b)  $F^-$   
(c)  $Na^{2+}$  (d)  $Mg^{3+}$
- Q.45. Oxidation number of Nitrogen in Hydrazoic Acid is  
(a) + 1 (b) – 1  
(c) + 1/3 (d) – 1/3
- Q.46. Isotonic solutions of same Nonvolatile solute have same  
(a) molality  
(b) molar concentration  
(c) normality  
(d) percentage concentration
- Q.47. Which of the following metals shows highest oxidation state?  
(a) *Cu* (b) *Cr*  
(c) *Mn* (d) *V*
- Q.48. Bond order is highest for  
(a)  $O_2^+$  (b)  $O_2^-$   
(c)  $O_2^{2-}$  (d)  $O_2^{2+}$



Q.49. The equilibrium constant for reaction  $H_2 + I_2 \rightleftharpoons 2HI$  is 50 at 705 K. The equilibrium constant for the reaction  $HI \rightleftharpoons \frac{1}{2}H_2 + \frac{1}{2}I_2$  at 705 K is:-

- (a) 50 (b) 1/50  
(c) 0.1414 (d) 1.414

Q.50. In the chemical reaction



The values of  $x, y$  and  $z$  are

- (a) 4, 1, 4 (b) 1, 3, 1  
(c) 3, 2, 3 (d) 2, 1, 2



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ANSWER SHEET FOR CHEMISTRY	Roll No.	

Q.No.	Ans.	Q.No.	Ans.	Q.No.	Ans.	Q.No.	Ans.	Q.No.	Ans.
1		2		3		4		5	
6		7		8		9		10	
11		12		13		14		15	
16		17		18		19		20	
21		22		23		24		25	
26		27		28		29		30	
31		32		33		34		35	
36		37		38		39		40	
41		42		43		44		45	
46		47		48		49		50	