**TIME : 3Hrs Max Marks - 70**

**SUBJECT - CHEMISTRY(THEORY)**

**CLASS - XI**

**GENERAL INSTRUCTIONS ;**

**1. All questions are compulsory.**

**2. Question no.1 to 7 are very short answer questions and carry 1 mark each.**

**3. Question no. 8 to 17 are short answer questions and carry 2 marks each.**

**4. Question no 18 to 25 are also short answer questions and carry 3 marks each.**

**5. Question no 26 is short answer question and carry 4 marks .**

**5. Question no.27 to 29are long answer questions and carry 5 marks each.**

**6. Use log tables if necessary.**

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**Q 1. Which is the simplest form of the matter; an atom or an element?**

**Q 2. Boiling point of ethane is more than that of ethane. Assign reason.**

**Q 3. State Boyle’s law.**

**Q 4. what will happen to the internal energy if work is done by the system?**

**Q 5. Name the radioactive isotope of hydrogen.**

**Q 6. Name the halogen used to detect the presence of the double bond in an alkane.**

**Q 7. Why photochemical smog so named? [1\*7=7]**

**Or**

**. Write the electronic configuration of Cr2+ (z=24) and predict the number**

**electrons having n + l value equal to 3.**

**Q 8. Calculate (a)mass of 2.5 g of magnesium. (b) Gram atoms in 1.4 g of nitrogen.**

**Q 9. Differentiate between molarity and molality.**

**Q 10. Out of 3d and 4s orbitals which is filled first?**

**Q 11. State the following;**

1. **Pauli’s exclusion principle**

**(ii) Heisenbergs uncertainty principle**

**Q 12. Consider the following species N3-, O2- , Al3+ , Mg2+ , Na+ , F-**

1. **What is common in them.**
2. **What are they called.**

**Q13. Why magnesium does not impart colour to the flame?**

**Q14. Write short note on acid rain.**

**Q15 . Explain why hydrogen peroxide is stored in coloured bottles?**

**Q16. Why PbCl4 is unstable as compared to PbCl2?**

**Q17. Write IUPAC names of the following compounds: H3C**

**CH3 OH**

1. **CH3 CH2  CH CH CH2 CH3 (b) CH3 CH2 CH CH3(c) H3 C CH3 NO2**

**(d)**

**CH2Cl [10\*2=20]**

**Q18. Differentiate between ideal and real gas.**

**Q19. (a) Define intensive and extensive property and give examples of each.**

**(b) Derive relation between Cp and Cv**

**Q20. Following reactions occurs in a blast furnace Fe2O3(s) + 3CO 2Fe (l) +3CO2 (g)**

**Use the Le chatelier’s principle to predict the direction of reaction when equilibrium mixture is disturbed by (a) adding Fe2O3 (b) removing CO2 (c) removing CO**

**Q21. (a) define common ion effect(b) calculate the hydrogen ion concentration and hydroxyl ion concentration of 0.01M solution of NaOH at 298K**

**Q22. (a) Balance the following chemical reaction**

1. **NO3- +Bi Bi3+ + NO2(in acidic solution)**

**(ii) Cr2O7 + Fe2+ Cr3+ +Fe3+  (in acidic solution)**

1. **Calculate the oxidation number of underlined atoms of the following:-**
2. **NaBH4 (ii) H2S2O**7

**Q23. (a) What is plaster of Paris? Write its method of preparation.**

**(b) Why ionization energy of radium is higher than of barium?**

**Q24. (a) Write name and chemical formula of inorganic benzene and hydrolith.**

**(b) Why CO2 is gas while SiO2 is a solid?**

**Q25. (a) Why does benzene undergo electrophillic substitution easily?**

**(b) Write mechanism of Friedal craft alkylation reaction. [8\*3=24]**

**Q26. The first ionization enthalpy ( iH1 ) and second ( iH2 )ionization enthalpy(in KJMol-1) and eegH electron gain enthalpy (in KJMol-1) of a few elements are given below:**

**Elements ( iH1 ) ( iH2 ) egH I 520 7300 -60**

**II 419 3051 -48**

**Iii 1681 3374 -328**

**Iv 1008 1846 -295**

**V 2372 5251 +48**

**vi 738 1541 -40**

**which of the element is likely to be**

1. **The least radioactive element(b) The most reactive non metal(c) The most reactive metal**
2. **The least reactive non metal (e) Name the metals which form stable binary compounds with formula MX2(where X= halogen)(f) the metal which form stable covalent halide of formula MX**

**(g) Name the element which is used in photoelectric cells. [1\*4=4]**

**Q27. (a) Discuss the hybridization of SF6 molecule.**

1. **Write molecular orbital configuration of N2 and explain stability of N2**, **N22-, N22+**
2. **Also explain their magnetic behavior.**

**Or**

1. **What is hydrogen bonding? Explain its types.**
2. **Why bond angle of NH3 is more than PH3 explain.**

**Q28. (a) Explain free radical mechanism of halogenations of alkanes.**

**H (b) Out of following which are aromatic**

**+**

**(1) (2)**

**..**

**S**

**..**

**OR**

**Complete the following reactions:-**

**(a) OH**

**+ Zn**

**(b)Complete the missing links in the following:**

**CH3 Br Mg/ether [A] H2O [B] Cl2 [C]Na/ether [D]**

**(c) Ni/473K**

**+H2 [A]**

**(d)**

**HNO3/H2SO4 Cl2/FeCl3**

**[A] [B]**

**(e)CH CH red hot tube/Cu tube [A]**

**Q29. (a) Why benzyl carbocation is more stable than ethyl carbocation? Justify.**

**(b) Predict the nature of M- effect when Cl and NO2 groups are attached to the benzene ring. Also write different resonating structures.**

**OR**

**(a) Pick electrophile and nucleophile from the following:**

**(i) NH3(ii)NO2+(iii)CN-(iv)RNH2(v)SO3(vi)ROH(vii)RO-(viii)FeCl3**

**(b) Cyclohexylamine is more basic than aniline explain.**

**(c) Why electromeric effect is temporary? [3\*5=15]**