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| **PERIODIC TEST -3 (2022-23)** | | | | | |
| **Subject: CHEMISTRY**  **Grade: XI** | | Max. Marks:35Time:1Hr15mts | | | |
| **Name:** | | | **Section:** | **Roll No:** | |
| ***General Instructions:***   * GENERAL INSTRUCTIONS: Read the following instructions carefully.   1. There are 16 questions in this question paper.  2. SECTION A - Q. No. 1 to 5 are multiple choice questions carrying 1marks each.  3. SECTION B - Q. No. 6 to 10 are short answer questions carrying 2 marks each.  4. SECTION C- Q. No. 11 to 15 are short answer questions carrying 3 marks each.  5. SECTION C- Q. No. 16 is a long answer question carrying 5 mark.  6. All questions are compulsory.  7. Use of calculators is not allowed | | | | | |
|  | **SECTION A** | | | | |
| 1 | When acetylene is passed through dil.H2​SO4​ in the presence of HgSO4​, the compound formed is  1. Ether 2. Ketone 3. Acetic acid 4. Acetaldehyde | | | | 1 |
| 2 | A thermodynamic state function is a quantity   1. used to determine heat changes 2. whose value is independent of path 3. used to determine pressure volume work 4. whose value depends on temperature only | | | | 1 |
| 3 | For the process to occur under adiabatic conditions, the correct condition is  a) ∆T = 0  b) ∆p = 0  c) q = 0  d) w = 0 | | | | 1 |
| 4 | In the following questions, a statement of assertion is followed by a statement of reason Mark the correct choice as:  (a) Both A and R are correct, and R is the correct explanation of A.  (b) Both A and R are correct, but R is not the correct explanation of A.  (c) Both A and R are not correct  (d) A is not correct but R is correct  **Assertion (A):** ∆H and ∆U are same for the reaction N2 (g) + O2 (g) → 2NO(g)  **Reason (R):** . All the reactants and products are gases. | | | | 1 |
| 5 | **Assertion**: Nitrobenzene does not undergo Friedel Crafts reaction. **Reason:** Nitrobenzene is a m-director. | | | | 1 |
|  | **SECTION B** | | | |  |
| 6 | Give the structures of the major organic products from 3-ethylpent-2-ene with HBr in presence of peroxide.  1. Arrange benzene, n-hexane and ethyne in decreasing order of acidic behaviour.   Also give reason for this behaviour. | | | | 2 |
| 7 | Propanal and pentan-3-one are the ozonolysis products of an alkene. What is the structural formula of the alkene? Also write its IUPAC name. | | | | 2 |
| 8 | 1. What are the necessary conditions for any system to be aromatic? 2. Explain the nature of following compound. Give reason to your answer. | | | | 2 |
| 9 | Derive the relationship between Cp and Cv for an ideal gas. | | | | 2 |
| 10 | Distinguish between extensive and intensive properties. Give one example each. | | | | 2 |
|  | **SECTION C** | | | |  |
| 11 | **Complete the following:**  **a)**    **b)**    **c)** | | | | 3 |
| 12 | i)Explain the following:   1. Friedel-Crafts alkylation reaction   ii) What happens when Benzene is treated with conc. Nitric and conc. Sulphuric acid.  iii) What do you mean by carcinogenic hydrocarbons? Give one example. | | | | 3 |
| 13 | 1. Write the statement of Hess’s law 2. Enthalpies of formation of CO(g), CO2(g), N2O(g), and N2O4(g) are -110, -393, +81 and 9.7 kJ mol-1 respectively. Find the value of ∆rH for the reaction:   N2O4 (g) + 3CO (g) →N2O (g) + 3CO2 (g) | | | | 3 |
| 14 | 1. A sample of 1.0 mol of a monoatomic ideal gas is taken through a cyclic process of expansion and compression as shown in Figure. What will be the value of ΔH for the cycle as a whole?      1. Derive the relationship between ΔH and ΔU for an ideal gas. | | | | 3 |
| 15 | 1. Define standard enthalpy of formation. 2. Explain why the enthalpy changes for the reactions given below are not the enthalpies of formation of CaCO3 and HBr. 3. CaO(s) + CO2 (g) → CaCO3 (s) ; ∆H = -178.3 KJ/ mol 4. H2(g) + Br2(g) → 2HBr (g) ; ∆H = -72.8 KJ/ mol | | | | 3 |
|  | . **SECTION D** | | | |  |
| 16 | 1. A hydrocarbon 'A' adds one mole of hydrogen in the presence of Pt as catalyst to form n -hexane. 'A' is oxidized vigorously with KMnO4, a single carboxylic acid containing three carbon atoms is isolated. Give the structure and name of 'A' and explain the reactions.   b) How will you convert the following:  (i) benzene into p-Nitrobromobenzene  (ii) benzene into Acetophenone  (iii) Phenol to benzene | | | | 5 |