|  |  |  |  |
| --- | --- | --- | --- |
| **B** | | | |
| **HY/CHAK/1220/B 22/11/2020** | | | |
| **HALF YEARLYEXAMINATION (2020-21)** | | | |
| **Subject: CHEMISTRY**  **Grade: XII** | | Max. Marks: 70Time: 3.00Hr | |
|  | **SECTION - A** | |  |
| 1.(i) | c | | 1 |
| (ii) | a or b | | 1 |
| (iii) | a | | 1  1 |
| (iv) | d | |
| 2.(i) | c | | 1 |
| (ii) | **a** | | 1 |
| (iii) | d | | 1 |
| (iv) | a or a | | 1 |
| 3. | d | | 1 |
| 4 | d or c | | 1 |
| 5 | c | | 1 |
| 6 | b | | 1 |
| 7. | d or a | | 1 |
| 8 | d | | 1 |
| 9 | c | | 1 |
| 10 | c | | 1 |
| 11 | a | | 1 |
| 12 | a | | 1 |
| 13 | d | | 1 |
| 14 | b or a | | 1 |
| 15 | c | | 1 |
| 16 | c | | 1 |
|  | **SECTION - B** | |  |
| 17 | MwB=Kb×1000×WB/ΔTb×WA ∴MwB=2.53×1000×3.24/0.81×40=253 Let the molecular formula of sulphur = Sx Atomic mass of sulphur = 32 Molecular mass = 32×x ∴32x=253 x=253/32=7.91≈8 ∴∴ Molecular formula of sulphur =S8  **OR** | | 1  ½  ½ |
|  | It is given that the solubility of in water at STP is 0.195 m, i.e., 0.195 mol of is dissolved in 1000 g of water.  Moles of water =  = 55.56 mol  ∴Mole fraction of , *x* =  =  = 0.0035  At STP, pressure (*p*) = 0.987 bar  According to Henry's law:  *p*= KH*x* | | 1  1 |
| 18. | a) Cr2+ is less stable than Cr3+ therefore it is good reducing agent. Cr3+ is stable because outer most electronic configuration of Cr3+ is 3d3, which makes a stable half filled t2g configuration. Whereas Mn2+ has outermost electronic configuration as 3d5which is stable due to half filled d-orbitals therefore it is not reducing agent.  The almost identical radii of Zr (160 pm) and Hf (159 pm), a consequence of the lanthanoid contraction, account for their occurrence together in nature and for the difficulty faced in their separation. | | 1  1 |
| 19 | x/m =kp1/n  Plot and explanation | | 2 |
|  | **OR** | |  |
|  | a) On adding an electrolyte, coagulation of colloidal particles take place and solution get precipitated.  b) On passing current, its charged particles move towards the oppositely charged electrode due to the electrophoresis phenomenon. | | 1  1 |
| 20 | The products obtained by acylation reaction are known as amides. The reaction is carried out in the presence of a base stronger than the amine, like pyridine, which removes HCl so formed and shifts the equilibrium to the right-hand side. | | 1  1 |
|  | OR | |  |
|  | Primary amine can form intermolecular hydrogen bonding, resulting in higher boiling point and tertiary amines do not form hydrogen bonding due to absence of hydrogen on amino group. | | 1  1 |
| 21 | 1. In transition elements, the oxidation state can vary from +1 to the highest oxidation state by removing all its valence electrons. Also, in transition elements, the oxidation states differ by 1 (and ; and ). In non-transition elements, the oxidation states differ by 2, for example, +2 and +4 or +3 and +5, etc.  1. and Cu+ have an empty *d*-orbital. Only the ions that have electrons in *d*-orbital and in which d-d transition is possible will be coloured. | | 1  1 |
| 22. | (Any 2 points) | | 2 |
| 23. | On increasing the concentration of Sn4+, EMF of the cell will increase. | | ½  1  ½ |
| 24. | 1. 4NaCl + MnO2 + 4H2SO4 🡪 MnCl2 + 4NaHSO4 + 2H2O + Cl2 2. 2Ca(OH) 2 + 2Cl2 🡪 Ca(OCl) 2 + CaCl2 + 2H2O | | 1  1 |
| 25. | A+B  C+D     Rate  = 1  when [A] = 1 ---------- 1)   Rate = 2  when [A] = 2-----------2)   Dividing equation 2) by 1)     21    The reaction is first order reaction. | | ½  1  ½ |
|  | **SECTION - C** | |  |
| 26. |  | | 1  1  1 |
|  | OR  Compound A is Pentan-3-one (CH3-CH2-CO-CH2-CH3).  Pentan-3-one oxidizes to form propanoic acid. (B) CH3-CH2-CO-CH2-CH3 + [O] ---> CH3-CH2-COOH + CH3-COOH  Hence, compound B is propanoic acid (CH3-CH2-COOH).  C) Propanoic acid on kolbes reaction gives n-butane. CH3-CH2-COONa ---> CH3-CH2-CH2-CH3  Therefore, Compound C is n-butane (CH3-CH2-CH2-CH3). | | 1  1  1 |
| 27. | **a)**   |  |  | | --- | --- | | **Lyophobic sol** | **Lyophillic sol.** | | 1. It is relatively unstable due to Repulsion between dispersion ium and dispersed  phase. | 1. It is relatively more stable due to med- attraction between dispersion medium and dispersed Phase. | | 2. It is irreversible. | 2.  It is reversible. | | 3. It cannot be easily peptised. | 3.  It can be easily peptised. | | 4. Small quantities of electrolyte cause precipitation. | 4.  Small quantities of electrolyte has no  effect larger concentration causes precipitation. |   b) When a beam of light is passed through a colloidal solution, then scattering of light is observed. This is known as the Tyndall effect. This scattering of light illuminates the path of the beam in the colloidal solution. | | 2  1 |
|  | OR | |  |
|  | The dirty water contains electrically charged impurities which get coagulated on adding alum which contains ion. These impurities settle down after coagulation and are then filtered.  The substances, which at low concentration behave as normal electrolyte but at higher concentration exhibit colloidal behavior due to formation of aggregates, are called associated colloids. For example – soaps and detergents | | 1  1  1 |
| 28. |  | | 1  1  1 |
| 29. | Hydrolysis of XeF4 and XeF6 with water gives XeO3.  6XeF4 + 12H2O 🡪 2XeO3 + 4Xe + 3O2 + 24HF  XeF6 + 3H2O 🡪 XeO3 + 6HF | | 1  1  1 |
| 30 | The given reaction is of the first order with respect to A and of zero order with respect to B.  Therefore, the rate of the reaction is given by,  Rate = *k* [A]  From experiment I, we obtain  From experiment II, we obtain  From experiment III, we obtain  From experiment IV, we obtain  b) The unit of rate constant will be. | | ½  ½  ½  1 |
|  | **SECTION - D** | |  |
| 31 | a) A mixture of two aldehydes or ketones, atleast one of these must containing -hydrogen undergo cross-aldol condensation. A mixture of four products is formed. Cross Aldol Condensation.    (CH3 ) 2 CHCOOH < CH3 CH(Br)CH2 COOH < CH3 CH2 CH(Br)COOH  OR  Dispersal of negative charge on carboxylate ions than phenate ion. | | 1  1  1  1  1  1  1  1  1  1 |
| 32. | A-Sulphur  B-H2S  C-SO2  D-SO3  2H2S(g) + 3O2(g) 🡪 2H2O(l) + 2SO2(g)  5SO2 + 2MnO4- + 2H2O 🡪 5SO42- + 4H+ + 2Mn2+  2SO2 (g) + O2 (g) ----🡪 2SO3 (g)  (b) SO2 + 2Fe3+ + 2H2O 🡪 SO42- + 4H+ + 2Fe2+    **OR**   1. A is an oxygen gas which is paramagnetic and B is an ozone gas which is the powerful oxidizing agent than A oxygen.      1. Ozone protects the earth’s surface from excessive concentration of ultraviolet (UV) radiations   © When ozone reacts with an excess of potassium iodide solution buffered with a borate buffer (PH = 9.2) iodine is liberated. This iodine can be titrated against a standard solution of sodium thiosulphate to estimate the amount of ozone. | | ½  ½  ½  ½  ½  1  ½  1  1  1  1  1  1 |
| 33 | b)  OR  a)  b)  c)ii)  i) | | 1  1  1  1  1  2  1  1  1 |

\*\*\*