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| **PB1/CHAK/1223/A 30-NOV-2023** | | | |
| **PRE-BOARD EXAMINATION – I (2023-24)** | | | |
| **ANSWER KEY** | | | |
| **Subject: CHEMISTRY**  **Grade: XII** | | Max. Marks:70Time: 3Hrs | |
|  | **SECTION A** | | |
| 1 | d | | 1 |
| 2 | c | | 1 |
| 3 | a | | 1 |
| 4 | b | | 1 |
| 5 | a | | 1 |
| 6 | b | | 1 |
| 7 | c | | 1 |
| 8 | d | | 1 |
| 9 | b | | 1 |
| 10 | b | | 1 |
| 11 | **b** | | 1 |
| 12 | b | | 1 |
| 13 | d | | 1 |
| 14 | a | | 1 |
| 15 | a | | 1 |
| 16 | a | | 1 |
|  | **SECTION B** | |  |
| 17 | The law states that for a solution of volatile liquids, the partial vapour pressure (p) of each component in the solution is directly proportional to its mole fraction (x). p1∝x1 p1=p01x1   1. △mixH=0 2. △mixV=0 ( Any two)   OR  Henry's Law states that the solubility of a gas in liquid is directly proportional to the partial pressure of the gas ( Any 2 applications) | | 2 |
| 18 | 1. Hexaammineplatinum(IV) chloride | | 2 |
| 19 | 1. Butanone, , Propanone, Propanal, Ethanal 2. CH3CH2CH3, CH3CHO, CH3CH2OH | | 2 |
| 20 | 1. Replication   A sequence of bases on DNA is unique for a person and is the genetic material transferred to the individual from the parent which helps in the determination of paternity.  (b) During denaturation secondary and tertiary structures are destroyed but the primary structure remains intact. | | 2 |
| 21 | (i) The hydrogen attached to N-Ethylbenzene sulphonamide is acidic in nature. This is due to the presence of strong electron withdrawing sulphonyl group. Hence, it is soluble in alkali.  (ii) Reduction with iron scrap and hydrochloric acid is preferred because FeCl2 formed gets hydrolysed to release hydrochloric acid during the reaction. Thus, only a small amount of hydrochloric acid is required to initiate the reaction. | | 2 |
|  | **SECTION C** | |  |
| 22 | 1. The reactant Sucrose is dextrorotatory. On hydrolysis it gives glucose dextrorotatory and fructose which is leavoroatatory. The specific rotation of fructose is higher than glucose.   Sucrose is dextrorotatory but after hydrolysis gives dextrorotatory glucose and laevorotatory fructose. Since the laevorotation of fructose (–92.4°) is more than dextrorotation of glucose (+ 52.5°), the mixture is laevorotatory.   1. Invert sugar, The hydrolysis of sucrose brings about a change in the sign of rotation, from dextro (+) to laevo (–) and the product is named as invert sugar.   © | | 3 |
| 23 |  | | 3 |
| 24 | **OR**   1. Stephen reaction, CH 3CH2CHO, Propanal 2. Friedel-Crafts reaction | | 3 |
| 25 | 1. Fibrous proteins When the polypeptide chains run parallel and are held together by hydrogen and disulphide bonds, then fibre– like structure is formed. Such proteins are generally insoluble in water.(any one eg,)   Globular proteins This structure results when the chains of polypeptides coil around to give a spherical shape. These are usually soluble in water (any one eg)   1. The amino acids, which can be synthesised in the body, are known as nonessential amino acids.   Those which cannot be synthesised in the body and must be obtained through diet, are known as essential amino acids (one eg.each) | | 3 |
| 26 | 1. Ambident nucleophile- two different nucleophilic centers.(any one eg) 2. Because the bond between carbon and iodine in this case is weaker than the bond between carbon and bromine in (CH3)3C-Br, the (CH3)3C-I substrate is more reactive towards the SN1 reaction. | | 3 |
| 27 | a) Grignard reagents are highly reactive and react with any source of proton to give hydrocarbons.  b) The new force of attraction between the alkyl halides and water molecules is weaker than the alkyl halide-alkyl halide and water-water forces of attraction.  c) It is due to symmetry of para-isomers that fits in crystal lattice better as compared to ortho- and meta-isomers. | |  |
| 28 | b) | | 3 |
|  | **SECTION D** | |  |
| 29 | 1. Because aniline is less basic than methylamine due to the stabilization lone pair of N by resonance effect.   OR  p-nitroaniline < aniline < p-toluidine.  C) In aromatic amines, the −NH2 group is attached to a −C6H5 group, which is an electron-withdrawing group. So, the availability of a lone pair of electrons on N is decreased. Therefore, aliphatic amines are more basic than aromatic amines.  ii) | | 4 |
| 30 | a) k = mol L–1 s–1  b)    c) | | 4 |
|  | . **SECTION E** | |  |
| 31 | a)    b)  --Iodoform test  (ii) Benzoic acid –NaHCO3 test  **OR**      2. FCH2COOH is more acidic due to greater – I Effect 3. CH3CH=CHCH2CHO 4. Propanal-Tollens test ( eqn) OR propanone-Iodoform (eqn) | | 5 |
| 32 | 1. Dissolution of gas is an exothermic process. As the temperature is raised, the equilibrium shifts in reverse direction (Le-Chatelier's principle). It results in decrease of solubility of gases in liquid.   **Negative Deviation** is expected when phenol and aniline are mixed with each other.  The A-A forces (forces between similar molecules) are weaker than the A-B forces (forces between different molecules) and hence, the solution will show negative deviation.   1. Sodium chloride depress the freezing point of water to such an extent that it cannot freeze to form ice. Therefore, it melts off easily at the prevailing temperature. 2. 1M Al2(SO4)3 , 1M PbCl2, 1M glucose 3. The solutions which show a large positive deviation from Raoult’s law form minimum boiling azeotrope at a specific composition.T he solutions that show large negative deviation from Raoult’s law form maximum boiling azeotrope at a specific composition 4. When the RBCs are placed in the 0.1% NaCl solution the water will flow inside the cells as it moves from less concentrated to more concentrated solution. At a point the cell will be so swollen, enough to burst. 5. The advantage of the osmotic pressure method is that it is measured at room temperature. It is convenient to measure at room temperature then at boiling point. The value of osmotic pressure is quite appreciable even for very dilute solutions of polymers as compared to that of elevation boiling point. | | 5 |
| 33 | 1. . CN=6   ON=(II)   1. Hybridisation of the compound [Co(C2O4)3]3− is d2sp3.   No unpaired electron, it is diamagnetic in nature.  c) .  **OR**   1. Dichloridobis(ethane-1,2-diamine)cobalt(III) chloride     c) | |  |