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| **PT1/CHAK/1122/A 29-AUG-2022** | | | |
| **PERIODIC TEST - I (2022-2023)** | | | |
| **Subject: CHEMISTRY**  **Grade: XI** | | Max. Marks: 35Time: | |
| 1. | (a) 12.044 × 1020 molecules | | 1 |
| 2 | (d) 0.167, 11.11 | | 1 |
| 3 | (a) Balmer series | | 1 |
| 4 | (d)n =2 to n =1 | | 1 |
| 5 | (c) 1.0 L of solution | | 1 |
| 6 | 1. Number of oxygen atoms =  16 × 6.022 × 10 23/ 48 = 2.007 × 1023 2. CH2O. | | 2 |
| 7 | Write short note on :   1. Continuous spectrum is a spectrum (as of light emitted by a white-hot lamp filament) having no apparent breaks or gaps throughout its wavelength range   Discontinuous spectrum is a spectrum between a range of wave lengths that contains breaks or gaps in terms of wavelengths   1. Absorbtion spectrum: It is defined as a spectrum of electromagnetic radiation transmitted through a substance, showing dark lines or bands due to absorption at specific wavelengths.   Emission spectrum: It is defined as a spectrum of radiation emitted by a substance that has absorbed energy. | | 2 |
| 8 | 1. It is because molality does not change with temperature as it involves mass of solvent. 2. (i) 6 moles of carbon atom, (ii) 18 moles of hydrogen atoms | | 2 |
| 9 | This negative sign means that the energy of the electron in the atom is lower than the energy of a free electron at rest. A free electron at rest means that is infinitely far away from the nucleus and has the negligible attraction towards the nucleus. Thus it is assigned the energy value of zero. | | 2 |
| 10 |  | | 2 |
| 11 |  | | 3 |
| 12 | Define:   1. Limiting reagent: a reactant present to a lesser extent and therefore gets consumed completely . 2. Law of multiple proportion : when two elements combine with each other to form more than one compound, the weights of one element that combine with a fixed weight of the other are in a ratio of small whole numbers. 3. Mole fraction: it is the ratio of number of moles of a component to the total number of moles of all the components in a mixture | | 3 |
| 13 | 1. used in chemical analysis to identify unknown atoms 2. Elements like rubidium (Rb), caesium (Cs) thallium (Tl), indium (In), gallium (Ga) and scandium (Sc) were discovered when their minerals were analysed by spectroscopic methods. 3. The element helium (He) was discovered in the sun by spectroscopic method. | | 3 |
| 14 | 3 g of hydrogen will be the limiting reagent. 2H2(g)+O2⟶2H2O From the above equation, it is clear that 2 mole H2 reacts with 1 mole O2 The molar mass of H2 = 2 g The molar mass of O2 = 32 g 4 g H2 react with 32 g O2 3 g H2 reacts with = (32/4) x 3 g of O2 gas= 24 g  As the given amount of O2 is more than required therefore O2 is the excess reagent and H2 is the limiting reagent. 2 mole of hydrogen gas reacts to form 2 mole of the water molecule, therefore, 4 g of H2 produces = 36 g of water So the amount of H2O produced by 3 g H2 = (36/4) x 3= 27 g Hence, 27 g of water will be produced during the reaction As 24 g of oxygen has been utilized during the reaction and 29 g of oxygen was supplied therefore the amount of oxygen gas left is (29-24) = 5g | | 3 |
| 15 | State the observation when during photoelectric effect –   1. Number of photoelectrons increase 2. Kinetic energy of photoelectrons increase 3. No photoelectric effect occurs | | 3 |
| 16 | 1. State Gay-Lussac’s law states that the pressure of a given mass of gas varies directly with the absolute temperature of the gas when the volume is kept constant 2. It is a physical constant equal to one-twelfth of the [mass](https://www.thoughtco.com/definition-of-mass-604563) of an unbound [atom](https://www.thoughtco.com/definition-of-atom-and-examples-604373) of [carbon](https://www.thoughtco.com/carbon-element-facts-p2-606514)-12 (i) amu (ii)u. 3. (i) 1 mole of Ar = 6.022×1023 atoms of Ar   52 moles of Ar = 52 x 6.022 x 1023  **∴ 52 moles of Ar = 3.13144 × 1025 atoms of Ar**  (ii) The atomic mass of He is 4 amu.  **52 u of He will contain  52/4  = 13 atoms** | | 5 |

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