|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | | | | |
| **PT2/CHQP/1123/B 25-SEP-2023** | | | | | |
| **PERIODIC TEST - II (2023-24)** | | | | | |
| **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 D- 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 | The magnetic quantum number indicates  (a) Size of orbitals  (b) Shape of orbitals  (c) Orientation of orbitals  (d) Nuclear Stability | | | | 1 |
| 2 | The electrons of the same orbitals can be distinguished by  (a) Principal quantum number  (b) Azimuthal quantum number  (c) Spin quantum number  (d) Magnetic quantum | | | | 1 |
| 3 | Which of the following statements does not form a part of Bohrs model of hydrogen atom?  (a) Energy of the electrons in the orbit is quantized.  (b) The electron in the orbit nearest the nucleus has the lowest energy.  (c) Electrons revolve in different orbits around the nucleus.  (d) The position and velocity of the electrons in the orbit cannot be determined simultaneously. | | | | 1 |
| 4. | In the question given below, there are two statements marked as Assertion (A) and Reason (R). Mark your answer as per the codes provided below:   1. Both A and R are correct, and R is the correct explanation of A. 2. Both A and R are correct, but R is not the correct explanation of A. 3. A is true but R is false 4. A is false but R is true   Assertion (A) : It is impossible to determine the exact position and exact momentum of an electron simultaneously  Reason (R) : The path of an electron in an atom is clearly defined. | | | | 1 |
| 5 | If electron, hydrogen, helium and neon nuclei are all moving with the velocity of light, then the wavelength associated with these particles are in the order  (a) Electron > hydrogen > helium > neon  (b) Electron > helium > hydrogen > neon  (c) Electron < hydrogen < helium < neon  (d) Neon < hydrogen < helium < electron | | | | 1 |
|  | **SECTION B** | | | |  |
| 6. | Calculate the mass of a photon with wavelength 3.6 A0 | | | | 2 |
| 7 | Which of the following orbital has a higher energy?  i)n =3, l= 2, m=+1,  ii) n =4, l =0, m= 0 | | | | 2 |
| 8 | **What is the maximum number of emission lines when the excited electron of a hydrogen atom in n = 6 drops to the ground state?** | | | | 2 |
| 9 | Calculate wave number of the line having frequency 5 x 10 16 Hertz? | | | | 2 |
| 10. | Write the electronic configurations of the following?a) Cu b) Mn+2 | | | | 2 |
|  | **SECTION C** | | | |  |
| 11 | a) Draw resonance structures of i) C6H5OH ii) C6H5NO2  b) Classify the following species as nucleophile and electrophile  OH- , CH3 + , BF3 , Cl- | | | | 3 |
| 12 | Show that the wavelength of a 150gm rubber ball travelling at the velocity of 50m/s is short enough to be observed. | | | | 3 |
| 13 | Calculate the frequency and wavelength of the radiation emitted when an electron in the hydrogen atom jumps from n=5 to n= 2. In which region of the electromagnetic spectrum will this line lie? | | | | 3 |
| 14 | Account for the following:  (a) Cr has electronic configuration [Ar]3d54s1 and not [Ar]3d44s2  (b) In building up of atoms, the filling up of 4s orbitals takes place before the 3d orbitals  (c) The ground state configuration of Nitrogen is not written as 1s22s22px22py12pz0 | | | | 3 |
| 15 | 1. What is a nodal surface or node? 2. Plot probability density (ψ2) vs distance of electron from the nucleus (r), for 1s orbital. 3. Using s, p, d notations, describe the orbital with the following quantum numbers.   (i) n=1, l=0; (ii) n = 3; l=1 | | | | 3 |
|  | **SECTION D** | | | |  |
| 16 | a) State Heisenberg’s Uncertainty Principle.  b**)**State Hund’s rule of maximum multiplicity.  c) **What will be the uncertainty in the position of an electron (mass = 9.1 x 10–31 kg) moving at 300 ms–1 with an accuracy of 0.001 percent?** | | | | 5 |

\*\*\*