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| **PERIODIC TEST 2 (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 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 | Which of the following set of quantum numbers belongs to the highest energy?  (a) n = 4, *l* = 0, m = 0, s = +  (b) n = 3, *l* = 0, m = 0, s = +  (c) n = 3, *l* = 1, m = 1, s = +  (d) n = 3, *l* = 2, m = 1, s = + | | | | 1 |
| 2 | Which of the following electronic transitions requires that the greatest quantity of energy be absorbed by a hydrogen atom?  (a) n = 1 to n = 2 (b) n = 2 to n = 4  (c) n = 3 to n = 6 (d) n = ∞ to n = 1 | | | | 1 |
| 3 | Bohr model can explain spectrum of  (a) the hydrogen atom only (b) an atom or ion having one electron only  (c) the hydrogen molecule only (d) the sodium atom only | | | | 1 |
| 4 | Which of the following species has same Bohr’s radius as that of hydrogen atom in n = 1 shell?  (a) n = 2, He+ (b) n = 2 , Li2+  (c) n = 3, Li2+ (d) n = 2, Be3+ | | | | 1 |
| 5 | Assuming the velocity to be same, which sub−atomic particle possesses smallest de Broglie  wavelength  (a) An electron (b) A proton  (c) An α−particle (d) All have same wavelength | | | | 1 |
|  | **SECTION B** | | | |  |
| 6 | Write down all the four quantum nos. for 19th electron of Cr (atomic number = 24) | | | | 2 |
| 7 | What are the two reasons for the failure of Bohr`s model of atom? | | | | 2 |
| 8 | What do mean by degenerate orbitals? Give two examples. | | | | 2 |
| 9 | Draw the resonating structure for Phenol. | | | | 2 |
| 10 | Give the electronic configuration of the following:   1. Mn2+ (ii) Atomic number 35 | | | | 2 |
|  | **SECTION C** | | | |  |
| 11 | What are the frequency and wavelength of a photon emitted during a transition from n = 5 state to the n = 2 state in the hydrogen atom? | | | | 3 |
| 12 | State the following:   1. Aufbau principle 2. Hund’s rule of maximum multiplicity 3. Pauli`s exclusion principle. | | | | 3 |
| 13 | The mass of an electron is 9.1 x 10–31 kg. If its K.E. is 3.0 x 10–25 J, calculate its wavelength. | | | | 3 |
| 14 | Give reason for the following :   1. Tertiary carbocation is more stable than secondary and primary carbocation. 2. Chloroacetic acid is less acidic than Nitro acetic acid. 3. But-2-ene is more stable then But-1-ene. | | | | 3 |
| 15 | Which quantum gives the following information’s:   1. Distance of electron from the nucleus 2. Orientation of the orbitals from any subshell. 3. Energy of the orbital in a multi-electron atom 4. Energy of the orbital 5. Direction of electron 6. Angular momentum of an orbital. | | | | 3 |
|  | **SECTION D** | | | |  |
| 16 | 1. Plot probability density (ψ2) vs distance of electron from the nucleus (r), for 1s orbital. 2. State Heisenberg uncertainty principle. 3. Calculate the uncertainty in position of an electron (Mass = 9.1 × 10–28 g) moving with a velocity of 3 × 104 cm/s accurate upto 0.001%. | | | | 1  1  3 |