

CHU 1221 – Answer Guide – Assessment Test I – 2006/07

- 10^{-6} corresponds to "micro". Correct answer is (2).
- Due to an oversight there are two answers. You should know the seven basic physical quantities and their SI units. Both energy and electric charge are not basic but derived quantities. Correct answer(2) or(3) or both.
- Pressure is defined as the force per unit area. Force by definition is mass x acceleration. SI unit for pressure is therefore $\text{kg m s}^{-2} / \text{m}^2$ or $\text{kg m}^{-1} \text{s}^{-2}$. Correct answer is (1).
- The question is based on the properties of cathode rays. Correct answer is (2).
- The main problem with Rutherford model of the atom was that the electron while circulation emits radiation and finally could end up falling onto the nucleus. This is related to stability. Therefore the answer is (3).
- Assume the percentage of ^{11}B atoms is x. Percentage of ^{10}B is therefore (1-x).
 $x \cdot 11 + (1-x) \cdot 10 = 10.8$ $x = 0.8$ or as a percentage 80 %. Answer is (4).
- There was a problem in expressing the concentration differently stated in Tamil and E/S.
- Position of the periodic table is determined by the atomic number. Answer is (4)
- Conduction in metals is by the movement of electrons whereas the conduction in ionic compounds are by ionic migration. Ionic bond has to be broken to get free ions. In solid state, they are not free. Correct answer is (3).
- In 2.8 g of N_2 there are 0.1 mol. Also, there are 14 electrons in each nitrogen atom. In a mole there are 6.023×10^{23} items. You should have (2) as the answer.
- Hess law. Correct answer is (3).
- The word quantization means only certain values can be taken. Answer (2).
- The question is for testing and Hund's rule and writing electron configurations. Answer is (5).
- de Broglie equation is related to the wave nature. Answer is (1).
- Molecular structures (1) to (5) will have some sort of dipole moment, whereas in (5) dipole moment will cancel.
- In (1) due to unequal sharing of electrons in O—H bond molecule will be polar. Other compounds are either ionic except SiO_2 which is a giant molecule.
- Inter molecular H bond. Answer is (3).
- $E = hc/\lambda$. Answer is (2).
- When $n = 2$, l should be either 0 or 1. When $n = 1$, $l = 0$. Therefore answer is (1).
- Zeeman effect is splitting of spectral lines in a magnetic field. This observation only led to the existence of sub energy levels. Answer(5).
- Definition. Gaseous state is essential. Answer(4).
- Answer (4).
- Only statements (a) and (c) are correct. Identified an error in responses mediumwise.
- Statement (b) is wrong. Correct answer (3).
- Definition. Note the physical states. Answer is (3).
- Valence shell is 2s. In B_2 molecule there should be 6 electrons in molecular orbitals. Filling of electrons takes place according to the energies of orbital. Only possible answer is (1).
- Magnetic properties are determined by the number of unpaired electrons. O_2 has two unpaired electrons. so is the Ni^{2+} ion. Answer(4).
- 4s electrons are lost before 3d. Correct answer (2).
- 5 electrons pairs. Answer (4).
- Answer (5).
- Question asks for the best statement which describes data. (4).
- Balmer series is formed when the electron falls to level 2. Answer is therefore (1).

33. If the anion is large and the cation is small, such compounds have more covalent character. Refer Fajan rules. Thus the answer is (3).
34. In order to obey octet rule there has to be eight electrons around atoms. In both SF_4 and POCl_3 there are 10 electrons around S, and P respectively. Answer(2).
35. Degenerate means of equal energy. P and d orbitals have degenerate orbitals. However, the principle energy level too need to be considered. The correct answer is therefore (4).
36. Realize that O_2^+ has one electron less than O_2 . Then there will be one electron less in the antibonding orbital. The bond order is $(8-3)/2 = 2.5$. The bond length should be in between that of a single and a double bond. Answer(3).
37. Most difficult to remove means it is close to the nucleus. Answer is (2).
38. Testing Hund's rule. Correct response is (2).
39. An orbital can accommodate only two electrons. Correct answer is (3).
40. Moving to higher energy levels gaps between spectral lines gets narrower- not equal (5) is the correct answer.