CT 2-18CYB101J- CHEMISTRY

* Required

Part – B (17 X 2 = 34 marks)

Answer all the questions (MCQ)

The wavelength of a radiation is 5 μm. What is wavenumber and frequency? (c= 2.998 x 108 ms-1) * 2 points

- (●) 2000 cm-1 and 59.95x1014 Hz
- ( ) 2000 cm-1 and 59.95x1012 Hz
- ( ) 2 cm and 59.95x1012 Hz
- ( ) 59 cm-1 and 2000 Hz

Calculate the CFSE values for d3 and d8 configurations of weak field octahedral complexes. * 2 points

- ( ) 0 Δo and -1.2 Δo
- ( ) 1.2 Δo and -1.2 Δo
- (●) -1.2 Δo and -1.2 Δo
- ( ) -1.2 and 0

Identify the increasing order of spectrochemical series * 2 points

- [x] $I^- < Br^- < S^{2-} < en < NO_2^- < CN^- < CO$
- [ ] $I^- < Br^- < S^{2-} < en < NO_2^- < CO < CN^-$
- [ ] $CO > CN^- > NO_2^- > en > I^- < Br^- < S^{2-}$
- [ ] $I^- < Br^- < S^{2-} = en = NO_2^- = CN^- < CO$

Calculate the number of fundamental vibrations for CO_2 and HCl molecules * 2 points

- [ ] 1 and 3
- [x] 4 and 1
- [ ] 0 and 1
- [ ] 3 and 4

What happens to the vibrational frequency of molecule upon increasing bond strength? * 2 points

- [ ] Decreases
- [ ] Remains same
- [x] Increases
- [ ] No dependence

Identify the regions of Bracket, Balmer and Lyman series of hydrogen atomic spectrum. * 2 points

- (●) IR, UV-Vis and UV
- ( ) UV-Vis, IR and UV
- ( ) UV, IR and UV-Vis
- ( ) UV-Vis, UV and IR

Identify the allowed spin selection and forbidden Laporte selection rule of electronic spectroscopy * 2 points

- ( ) singlet to triplet and u to u
- ( ) triplet to triplet and u to g
- ( ) triplet to singlet and u to u
- (●) triplet to triplet and u to u

The unit of rotational constant is_____ * 2 points

- (●) cm-1
- ( ) cm
- ( ) Joule
- ( ) unit less

Choose the correct statement(s) among the following: * 2 points

- [x] [FeCl4]- has tetrahedral geometry
- [ ] [Co(en)(NH3)2Cl2]+ has 2 geometrical isomers
- [ ] [FeCl4]- has low spin
- [ ] The cobalt ion in [Co(en)(NH3)2Cl2]+ has sp3 d2 hybridization

Which of the following ions is most unlikely to exist? * 2 points

- [x] Li-
- [ ] Be-
- [ ] B-
- [ ] F-

X-ray diffractometers provide_____information about the compounds present in a solid sample. * 2 points

- [ ] Quantitative
- [ ] Qualitative
- [x] Quantitative and qualitative
- [ ] Either quantitative or qualitative

Which of the following compounds show optical isomerism? * 2 points

- cis−[Co(NH3)4Cl2]+
- trans−[Co(en)2Cl2]+
- cis−[Co(en)2Cl2]+
- [Co(en)3]3-

The compound [Pt(NH3)Cl2] can exhibit_____ * 2 points

- Linkage isomerism
- Coordination isomerism
- Optical isomerism
- Geometrical isomerism

When EDTA solution is added to Mg2+ ion solution, then which of the following statements is not true? * 2 points

- Four coordinate sites of Mg2+ are occupied by EDTA and remaining two sites are occupied by water molecules
- All six coordinate sites of Mg2+ are occupied
- pH of the solution is decreased
- Colorless [Mg−EDTA]2− chelate is formed

Choose the correct statement * 2 points

- [x] As shielding effect increases electro negativity decreases
- [ ] As shielding effect increases electro negativity increases
- [ ] As ionization potential increases metallic property increases
- [ ] As +ve charge on species increases ionic radii increases

Which of the following gas is adsorbed most by activated charcoal? * 2 points

- [x] CO2
- [ ] N2
- [ ] CH4
- [ ] Ar

Among the following which is least soluble in water? * 2 points

- [ ] CaSO4
- [ ] MgSO4
- [ ] Na2SO4
- [x] BaSO4

Back Submit