



**Avinashilingam Institute for Home Science and Higher Education for Women**  
(Deemed to be University under Category 'A' by MHRD, Estd. u/s 3 of UGC Act 1956)  
Re-accredited with 'A+' Grade by NAAC. Recognised by UGC Under Section 12B  
Coimbatore - 641 043, Tamil Nadu, India

**Bachelor's Degree Examination – June 2021**  
**VI Semester**

**Class : III UG**  
**Major : Chemistry**

**Time : 3 Hours**  
**Max. Marks: 100**

**18BCHC24 Analytical Chemistry**

**Part A**

**10 x 1 = 10**

**Choose the Correct Answer**

- Which of the following error is caused by poor calibration of the instrument? CO1 K1
  - Random error
  - Gross error
  - Systematic error
  - Precision error
- Precipitation is applicable for what types of solutes? CO1 K1
  - Insoluble
  - soluble
  - sparingly soluble
  - Both insoluble and soluble
- Polarographic cells type of electrochemical method uses which of the following concepts? CO2 K1
  - cyclic reactions
  - exothermic reactions
  - reversible reactions
  - redox reactions
- Which of the following method can be used for the measurement of change in weight of theoxy salts? CO2 K1
  - Thermoelectric analysis
  - Wagner analysis
  - Stockbarger analysis
  - Thermal analysis
- Which of the following molecule shows rotational spectra? CO3 K1
  - HCl
  - O<sub>2</sub>
  - N<sub>2</sub>
  - Br<sub>2</sub>
- What is the wavelength range for UV spectrum of light? CO3 K1
  - 400 nm -700 nm
  - 700 nm to 1 mm
  - 0.01 nm to 10 nm
  - 10 nm to 400 nm
- The frequency of vibration of a bond is a function of which factor? CO4 K1
  - Force constant of the bond
  - Masses of the atoms involved in bonding
  - Force constant of the bond and Masses of the atoms
  - Bond order
- The elastic scattering of photons is called as CO4 K1
  - Atmospheric scattering
  - Rayleigh scattering
  - Conserved Scattering
  - Raman Scattering
- The distance between the centers of the peaks of doublet is called as? CO5 K1
  - Coupling constant
  - Spin constant
  - Spin-spin coupling
  - Chemical shift
- How many Hertz does 1 ppm correspond to for a PMR spectrometer operating at a radio frequency of 60 MHz and 100 MHz? CO5 K1
  - 6 Hz, 10 Hz
  - 60 Hz, 100 Hz
  - 100 Hz, 60 Hz
  - 10Hz, 100Hz

**Part B****5 x 6 = 30****Answer ALL questions****Each answer should not exceed 400 words or two pages**

- 11.a. Discuss the methods involved in minimizing errors? CO1 K2  
(or)
- 11.b. Explain the principles of solubility products (K<sub>sp</sub>) CO1 K2
- 12.a. Analyze the Ilkovic equation. CO2 K4  
(or)
- 12.b. Explain the TGA of CuSO<sub>4</sub>.5H<sub>2</sub>O. CO2 K2
- 13.a. Discuss the selection rule of rotational spectra and their applications. CO3 K2  
(or)
- 13.b. Explain the Frank-Condon principle. CO3 K2
- 14.a. Differentiate between Raman and IR spectroscopy. CO4 K2  
(or)
- 14.b. Infer the hydrogen bonding by IR? CO4 K2
- 15.a. Explain the shielding and deshielding in NMR. CO5 K2  
(or)
- 15.b. Discuss the chemical shift and coupling constants. CO5 K2

**Part C****5 x 12 = 60****Answer ALL questions****Each answer should not exceed 800 words or four pages**

- 16.a. Analyze the term mean, median, standard deviation and mean deviation. CO1 K2  
(or)
- 16.b. i. Compare co precipitation and post precipitations. CO1 K2  
ii. List the conditions required for precipitations. CO1 K2
- 17.a. i. Show the advantages and disadvantages of DME. CO2 K2  
ii. Explain the limiting, diffusion and migration current. CO2 K2  
(or)
- 17.b. List the factors affecting TGA and DTA curves. CO2 K2
- 18.a. Explain the rotational energy level for diatomic molecules. CO3 K2  
(or)
- 18.b. i. Explain the types of electronic transitions. CO3 K2  
ii. List the factors affecting  $\lambda_{\max}$  CO3 K2
- 19.a. Interpret the IR spectra of acetone, anisole and ethyl acetate. CO4 K3  
(or)
- 19.b. i. Compare Raman and Rayleigh scattering. CO4 K3  
ii. Explain the following: stokes and anti-stokes lines mutual exclusion principle. CO4 K3
- 20.a. Interpret NMR spectrum of Ethanol, acetone and benzaldehyde. CO5 K3  
(or)
- 20.b. Explain the principle and instrumentation of nuclear magnetic resonance. CO5 K3

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