TTCiTCTT

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2017
(Sixth Semester)

Branch- **CHEMISTRY**

ANALYTICAL CHEMISTRY AND INSTRUMENTAL METHODS OF ANALYSIS

Time Three Hours Maximum ; 75 Marks

SECTION-A (20 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks (J.0 x 2 = 20)

1 The observed and accepted values for an estimation are 18.34 and 18.28 respectively calculate the absolute error and relative error.

1 Write the basic principle of thermogravimetry.

3 Give the necessary condition required for a molecule to absorb IR radiation.

4 Write two advantages of Raman spectroscopy over IR spectroscopy.

5 State Beer - Lambert's law.

6 Ethanol is a good solvent for UV spectroscopy - Give reason.

7 Define coupling constant.

8 Predict the number of lines in the ESR spectra of the following system.

(i) CH_3CH_2 redical. (b) C_6H_6 negativeion.

9 Define the term diffusion current and half wave potential.

10 Write the advantages of polarography.

SECTION - B (25 Marks)

Answer **ALL** Questions

ALL Questions Carry **EQUAL** Marks (5 x 5 = 25)

11 a Explain briefly on determinate error. How are they minimized?

OR

b Discuss the principle and instrumentation of DTA.

12 a The IR spectrum of CO shows a vibrational absorption peaks at 2170cm'[1]. Calculate the force constant for the CO bond.

OR

b Draw and explain the block diagram of a Raman instrument.

13 a Discuss the concentration of coloured solution can be estimated by standard series method.

OR

b Calculate the 2_{max} value for each of the following.

(i) CH3-CH = CH-CH = CH-CH_3 (ii) CH_2 = | - CO - CH_3.
CH,

14 a Describe with examples the various factors which affect the magnitude of the chemicalshift.

OR

b Discuss the principle and instrumentation of ESR spectrometer.

15 a Discuss the factors affecting the current voltage curves in polarographic studies.

OR

b Explain the analytical applications of polarography.

SECTION - C (30 Marks)

Answer any **THREE** Questions
ALL Questions Carry **EQUAL** Marks (3 x 10 = 30)

16 a) Write note on Correlation coefficient. (5)
b) Draw and describe a simple thermo balance used in TGA. (5)

17 a) How will you distinguish between intermolecular and intra molecular hydrogen bonding by IR spectroscopy?c (3)
b) Write note on Fermi resonance. (3)
c) Explain stokes and antistokes lines. (4)

18 a) Explain the construction of a Duboscq colorimeter. (5)
b) Discuss the application of UV spectroscopy in qualitative and kinetic studies. (5)

19 a) Calculate the chemical shift in ppm(*d*) for a proton that has resonance at 126Hz. (3)
b) Write the advantages of using TMS as an internal standard. (3)
c) Explain hyperfme splitting with suitable example. (4)

20 a) Explain briefly the instrumentation used in polarography. (5)
b) Write note on the following
(i) Supporting electrolytes (ii)Indicator electrode (5)

Z-Z-Z END