PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION MAY 2019
(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   (1 0 x 2 = 20)

1   Using the principle of significant figures, give the sum of four number 4.4, 4.44, 4.444 and 0.4444.
2   What are the precautions needed in the use of thermobalance?
3   Why IR radiation cannot bring about electronic changes?
4   What is meant by Stoke's radiations?
5   Write the principle of estimation of Fe^{si} by colorimetry.
6   Define chromophore and auxochrome.
7   Why does the signals in NMR split?
8   Draw the energy level diagram of methyl radical.
9   Define ORD and ORD curves.
10   Write the factors which govern the diffusion current.

SECTION - B (25 Marks)
Answer ALL Questions
ALL Questions Carry EQUAL Marks (5 x 5 = 25)

11 a What are determinate and indeterminate errors? How are they minimized?
OR
b Draw and explain TGA curve for $CaC_2O_4.H_2O$.

12 a What do you understand by fundamental vibrations? Explain different types of stretching and bending vibrations with the help of suitable diagram.
OR
b Explain the electromagnetic theory of Raman effect.

13 a Discuss in detail about the Laws of colorimetric analysis.
OR
b Write short notes on Frank - Condon principle.

14 a Explain the following :   (i) chemical shift is the difference in the absorption position of the proton with respect to TMS signal (ii) H - bonding shifts the NMR signal downfield.
OR
b Discuss the origin of ESR spectra and their fine structure.

15 a Enumerate the advantages of using DME.
OR
b Define the terms :
(i) Migration current
(ii) Residual current
(iii) Kinetic current

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

16a Discuss the characteristics and advantages of presenting data in a tabular form.

b Give an account of the applications of TGA.

17a Draw the schematic diagram of a double-beam IR spectrophotometer and explain the parts.

b Write short notes on stokes & antistokes lines.

18a How will you determine the unknown concentration of a given substance using Duboseq colorimeter?

b Discuss the applications of UV-visible spectroscopy.

19a Describe the instruemtnation of NMR spectroscopy.

b Write short notes on (i) 'g' value (ii) hyperfme splitting.

20   Describe the theory of diffusion current using Ilkovic equation.

Z-Z-Z   END