Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_\_

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**End Semester Examination – Apr/May – 2018**

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| **Code :** | **17CH1001** | **Duration :** | **3hrs** |
| **Sub. Name :** | **INSTRUMENTAL TECHNIQUES IN CHEMISTRY** | **Max. marks :** | **100** |

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| **Q. No.** | **Questions** | **Course Outcome** | **Marks** |
| **PART-A(20X1=20 MARKS)** | | | |
| 1. | The closeness of a measurement to its true value is a measure of its \_\_\_\_\_\_\_\_\_\_\_. | CO1 | 1 |
| 2. | When an error in a dataset leads to the commission of another error this is called \_\_\_\_\_\_\_\_\_\_\_. | CO1 | 1 |
| 3. | What is the Mean of numbers 6, 11 and 7? | CO1 | 1 |
| 4. | Gaussian curve is also sometimes called as \_\_\_\_\_\_\_\_\_\_\_. | CO1 | 1 |
| 5. | Write the formula to find the standard deviation. | CO1 | 1 |
| 6. | In Q test concept, the criterion to reject a data is \_\_\_\_\_\_\_\_\_\_\_. | CO1 | 1 |
| 7. | Measurement of milli litre of solution required for a reaction to quantify amount of another reactant is called \_\_\_\_\_\_\_\_\_\_\_. | CO2 | 1 |
| 8. | Quantitative determination of an analyte based on the mass of a solid is called \_\_\_\_\_\_\_\_\_\_\_. | CO2 | 1 |
| 9. | For precipitation to occur, ionic product must be \_\_\_\_\_\_\_\_\_\_\_ than solubility product. | CO2 | 1 |
| 10. | In volumetric titration of HCl vs Na2CO3, the indicator used is \_\_\_\_\_\_\_\_\_\_\_. | CO4 | 1 |
| 11. | Primary standard substances have properties such as \_\_\_\_\_\_\_\_\_\_\_. | CO4 | 1 |
| 12. | In potentiometry, the standard electrode used is \_\_\_\_\_\_\_\_\_\_\_. | CO5 | 1 |
| 13. | The measurement of the voltage difference between two half-cells immersed in solution is referred to as \_\_\_\_\_\_\_\_\_\_\_. | CO5 | 1 |
| 14. | Define indicator electrode \_\_\_\_\_\_\_\_\_\_\_. | CO5 | 1 |
| 15. | Write the purpose of salt bridge in electrochemical cell \_\_\_\_\_\_\_\_\_\_\_. | CO5 | 1 |
| 16. | State the reason for decrease in conductance till end point in a conductiometric titration of HCl Vs NaOH \_\_\_\_\_\_\_\_\_\_\_. | CO5 | 1 |
| 17. | Define sensor \_\_\_\_\_\_\_\_\_\_\_. | CO5 | 1 |
| 18. | Calculate one mole photon energy of radiation of wavelength 1190 nm  (Given : Plank’s constant – 6.6 X10-34 J s ). | CO5 | 1 |
| 19. | What are selection rule for IR spectroscopy? | CO3 | 1 |
| 20. | Define auxochrmoe. Give example. | CO3 | 1 |

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| **PART B(10 X 5= 50 MARKS)**  **(Answer any 10 from the following)** | | | |
| 21. | State Principle and explain quantification of trace metal ions in aqueous solution using atomic absorbance spectroscopy. | CO2 | 5 |
| 22. | Explain the method of estimating sodium ion in a food sample using flame photometer. | CO2 | 5 |
| 23. | State the principle of thin layer chromatography and explain the terms stationary phase, mobile phase and analyte. | CO6 | 5 |
| 24. | Explain the effect of migration rate on resolution of peaks in chromatography. | CO6 | 5 |
| 25. | How the adsorbent particle size and distribution affects the efficiency of separation in HPLC. | CO6 | 5 |
| 26. | Discuss the principle of liquid –liquid chromatography. | CO6 | 5 |
| 27. | Explain the mechanism of separation of charged particles using ion exchange chromatography. | CO6 | 5 |
| 28. | Compare various features of GC and HPLC. | CO6 | 5 |
| 29. | Discuss the properties studied using various thermal analysis techniques. | CO5 | 5 |
| 30. | State the principle involved in TGA analysis. | CO5 | 5 |
| 31. | Discuss the principle and property of analyte studied using DTA. | CO5 | 5 |
| 32. | State the principle involved in DSC analysis. | CO5 | 5 |

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| **PART C(2 X 15= 30 MARKS)**  **(Answer any 2 from the following)** | | | | |
| 33. | a. | What are the hardness producing ions generally present in water? List the effect of salt on plant growth. | CO2 | 5 |
| b. | Describe the method of estimating hardness of water using EDTA method. | CO2 | 10 |
| 34. | a. | What is alkalinity of water? What are its significance? | CO4 | 5 |
| b. | Describe the method determining phenolphthaline alkalinity and total alkalinity. | CO4 | 10 |
| 35. | a. | Write a note on FDA and FSSAI. | CO5 | 5 |
| b. | Discuss the various parameters of testing food articles. | CO5 | 10 |