16. Discuss the various unit processes involved in the gravimetric estimation of iron.

17. Explain the importance of solubility product in the inter group separation of cations.

18. Distinguish.between deductive and inductive methods.   **(Weightage 2×4=8)**

SECTION – D

Answer **any 2** questions. **Each** question carries a weightage of **4.**

19. Explain how the α-ray scattering experiment led to the formulation of the Rutherford model. What are the weaknesses of the model ?

20. Give an account of statistical treatment of experimental data.

21. i) Explain the role of hypothesis in scientific research.

   ii) Give a brief account of alchemy.   **(Weightage 4×2=8)**

Reg. No. : ....

Name : ....

I Semester B.Sc. Degree (CCSS – Supple./Improv.)
Examination, November 2014
(2012 and 13 Admn.)
CORE COURSE IN CHEMISTRY
1B01 CHE : Methodology of Chemistry as a Discipline of Science

Time : 3 Hours   Max. Weightage : 25

SECTION – A

Answer **all** questions. **Each** bunch of four questions carries a weightage of **1.**

Choose the correct answer.

1. i) The model proposed by J J Thomson
    a) Planetary model   b) Classical model
    c) Plum pudding model   d) Elliptical model

   ii) Who discovered neutron ?
    a) Rutherford   b) Chadwick   c) Thomson   d) Dalton

   iii) The laws of electrolysis were enunciated by
    a) Boyle   b) Dalton   c) Avogadro   d) Faraday

   iv) Who said in a talk that "There is a plenty of room at the bottom" ?
    a) Richard Feynman   b) Albert Einstein
    c) Erwin Schrodinger   d) Stephen Hawking

2. i) Who is considered to be the father of coordination chemistry ?
    a) Alfred Werner   b) Sidgwick N V
    c) Powell H. M.   d) Linus Pauling

ii) The indicator used for the titration of a strong acid and weak base is
   a) Phenolphthalein
   b) Either methyl orange or phenolphthalein
   c) Neither methyl orange nor phenolphthalein
   d) Methly orange

iii) Which of the following is a secondary standard ?
   a) $K_2Cr_2O_7$
   b) $KMnO_4$
   c) $FeSO_4$
   d) $H_2C_2O_4.2H_2O$

iv) The internal indicator used for the estimation of iron
   a) Eiochrome Black T.
   b) Potassium ferrocyanide
   c) N-phenyl anthranilic acid
   d) Murexide

3. i) An intelligent guess is
   a) Hypothesis   b) Law   c) Theory   d) Principle

ii) Fe is estimated gravimetrically as
   a) $FeSO_4$ b) Fe_2O_3 c) $FeCl_3$ d) $FeCO_3$

iii) H_2O_2 and H_2O contain 5.937 and 11.2% hydrogen respectively. The data illustrates
   a) Law of conservation of mass
   b) Law of constant proportion
   c) Law of multiple proportion
   d) Law of reciprocal proportion

iv) The oxidation number of Cr in $K_2Cr_2O_7$ is
   a) -6 b) 7   c) -7 d) 6

4. i) From the following, identify the one that measures dispersion.
   a) Median   b) Mode   c) Range   d) Mean

ii) The number of significant figures of 0.00023 is
   a) 6   b) 5   c) 4   d) 2

iii) The separation based on differential extraction makes use of the difference in
   a) Solubility
   b) Boiling point
   c) Melting point
   d) Viscosity

iv) The percentage of error is given by
   a) (Observed value – True value) × 100
   b) (Observed value – True value) × 100 / True value
   c) (Observed value – True value) /100
   d) (Observed value – True value) /True value ×100   (4×1=4)

SECTION – B

Answer **any 5** questions. **Each** question carries a weightage of **1**.

5. State the importance of Heisenberg's uncertainty principle.

6. Mention the role of chemistry in nano technology.

7. Mention any two weaknesses of Bohr model.

8. What is the difference between hypothesis and theory ?

9. What is the use of controls in the design of experiments ?

10. Calculate the amount of substance required to prepare 2 50 ml of 0.1 N solution of Na_2CO_3.

11. Explain the importance of addition reaction in organic synthesis.

12. What are determinate errors ?   (Weightage 5×1=5)

SECTION – C

Answer **any 4** questions. **Each** question carries a weightage of **2**.

13. Explain the importance of gas laws.

14. Give a brief account of experimental bias.

15. Explain the use of various indicators in redox titrations.