U121

SACRED HEART COLLEGE (AUTONOMOUS)
THEVARA, KOCHI -13
(Affiliated to Mahatma Gandhi University, Kottayam)

Reg. No. .....

Name.....

B. Sc. DEGREE EXAMINATION-NOVEMBER 2014

FIRST SEMESTER – CHEMISTRY (CORE)

COURSE: U1CRCHE1: METHODOLOGY OF CHEMISTRY AS A DISCIPLINE OF SCIENCE

Time: Three hours Max.Marks:60

Section A

(Answer **all** questions. Each question carries 1 mark)

1. Define nanotechnology.
2. Give the electronic configuration of the element with atomic number 51.
3. What is impact factor of a journal?
4. Astrology is not belong to a category of science, why?
5. Phenolphthalein is not suitable for the titration of strong acid with weak base. Why?
6. Give two advantages of synthetic detergents.
8. Give two examples for redox indicators.
7. What is a condensation reaction?

(8 × 1 = 8)

Section B

(Answer **any six** questions. Each question carries 2 marks)

9. Which substances are called secondary standards in titrimetry, why?
10. Calculate the mass of NaOH of eq. mass 40 required to prepare 100 ml of a standard solution of 0.2 normal NaOH.
11. What are the modes of hypotheses generation?
12. Discuss the importance of biotechnology.
13. What are paints and varnishes? Name two pigments used in paint industry.
14. Discuss the principle involved in the separation of Cu^{2+}& Cd^{2+} ions in group 2.
15. Distinguish between determinate and indeterminate errors.

16. Discuss the difference between accuracy and precision.

(6 × 2 = 12)

Section C

(Answer **any four** questions. Each question carries 5 marks)

17. Which indicator(s) can be used for the titration of (a) oxalic acid Vs KOH (b) Na_2CO_3 Vs H_2SO_4. Explain.
18. Discuss briefly the major types of 'reporting' adopted to publish the results of a scientific investigation.
19. Explain any two methods for the minimization of errors.
20. Briefly explain the evolution of quantum mechanical model of atom.
21. What is the use of controls in a scientific experiment?
22. Explain correlation and regression. (4 × 5 = 20)

Section D

(Answer **any two** questions. Each question carries 10 marks)

23. (a) Briefly explain the postulates of Dalton's theory.
    (b) Write a short note on modern periodic law.
24. (a) Briefly explain the steps involved in the development of theory from observations.
    (b) Explain with example why collection is very important in a scientific experiment.
25. (a)The following data were obtained for the measurement of copper content in a given sample. Find the standard deviation. Data: 0.160, 0.167, 0.158, 0.162, 0.157
    (b) Write a note on classification of errors.
26. (a) Explain how solubility product & common ion effect principles are applied in qualitative analysis.
    (b) Discuss the principle involved in complexometric titration using EDTA.

(2 × 10 = 20)

****