Reg. No. : .....

Name : .....

(Pages : 3)

B – 3056

First Semester B.Sc. Degree Examination, December 2016
First Degree Programme under CBCSS
CHEMISTRY
Core Course – I
CH 1141 : Inorganic Chemistry – I
(2013 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – A

Answer **all** questions. Answer in **one** word to a **maximum** of **two** sentences. **Each** question carries **1** mark.

1. Which of the following elements belong to 's' block of the periodic table ? Ca, B, C, Na, Ar.
2. How many nodes are there in the ground state wave function of particle in a 1D box ?
3. Define COD.
4. Give an example of a metallochromic indicator.
5. Arrange the following elements in the increasing order of their electron gain enthalpy. F, O, N, Cl.
6. What is post-precipitation ?
7. Name any two sources of the air pollutant, NO.
8. Name any two substances which are used as stationary phase in TLC.
9. Give one example each for a cation-exchange resin and an anion-Exchange resin.
10. What is smog ?

(10×1=10 Marks)

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SECTION – B

Short answer type questions (Answer **not** to exceed **one** paragraph). Answer **any eight** questions. **Each** question carries **2** marks.

11. If the position of an electron in a hydrogen atom is determined with an accuracy of 0.01 nm, what would be the uncertainty in its velocity ? Comment.

12. What do you mean by radial probability distribution function ? Plot the radial probability distribution of 2s orbital.

13. Define ionisation enthalpy. How does it vary along a period.

14. Give the quantum numbers of the outermost electron in copper atom.

15. What are the advantages of microscale analyses ?

16. Give the principle of two burette method of titration.

17. Discuss the principle of paper chromatography.

18. What do you mean by digestion of a precipitate ?

19. What are the harmful effects of fly ash in the atmosphere ?

20. Name the different segments of the environment.

21. What do you mean by acid rain ?

22. Describe the Winkler method for the determination of dissolved oxygen.

(8×2=16 Marks)

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SECTION – C

Short essay (answer **not** to exceed **120** words.) Answer **any six** questions. Each question carries **4** marks.

23. Illustrate the reasons for the anomalous behaviour of the first element of a group with an example.

24. Normalise the wave function $\psi = \sin\frac{n\pi x}{a}$ of particle confined in a 1D box of length, a.

25. How does phosphate anion interfere in qualitative inorganic mixture analysis ? Describe the procedure for eliminating it.

26. Discuss the factors affecting the solubility of precipitates in gravimetric analyses.

27. What are eigen functions and eigen values of an operator ? Illustrate with an example.

28. How do fertilizers contribute to soil pollution ?

29. What are the chemical processes for the formation of inorganic particulate matter in the atmosphere ?

30. Define electronegativity. Explain the Alred-Rochow scale for its calculation.

31. Write a note on the calibration of apparatus used in volumetric analyses.

(6×4=24 Marks)

SECTION – D
(Long essay)

Answer **any two** questions. **Each** question carries **15** marks.

32. How do you broadly classify the substances that pollute water ? Discuss.

33. Discuss the principles working and applications of ion exchange and gas chromatographic methods.

34. Discuss the theories of acid-base and redox indicators with examples.

35. a) Explain de Broglie's concept of matter waves. Describe an experiment which proved the wave nature of matter.

    b) State Pauli's exclusion principle and Hund's rule. Illustrate with examples. **(8+7)**

(2× 15=30 Marks)

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