



Reg. No. :

Name :

Third Semester B.Sc. Degree Examination, December 2017
First Degree Programme under CBCSS
CHEMISTRY
Core Course – II
CH 1341 – Inorganic Chemistry – II
(2013 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – A

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

- ✓ 1. Does water have a zero or non-zero dipole moment ? Why ?
2. Name a molecule which have T shape.
3. What is the shape of IF_7 molecule ?
- 4 . What is hydrogen bonding ?
5. Why nuclear fusion is regarded as thermonuclear reaction ?
6. Mention the range of N/P for stable nuclei.
7. Explain the self-ionization of ammonia.
8. State Beer-Lambert's law.
- ✓ 9. Mention the applications of AAS.
10. What are fullerenes ?

(10x1=10 Marks)

SECTION – B

Short answer type (**Not** to exceed **one** paragraph)

Answer **any 8** questions from the following. **Each** question carries **two** marks.

- ✓ 11. What is the hybridization in benzene ?

P.T.O.



- ✓12. What is an ionic bond ? Explain with example.
13. Describe the application of VSEPR theory in the determination of geometry of AB_5 type molecule without lone pairs.
14. Explain induced dipole-induced dipole interactions.
- ✓15. State Geiger-Nuttel rule.
- ✓16. Explain the release of large amount of energy during nuclear fission.
- ✓17. What are protic and aprotic solvents ? Give examples.
18. Ammoniacal solutions of alkali metals are blue in colour. Why ?
- ✓19. Distinguish between DTA and DSC.
20. What is XRD ? Explain.
- ✓21. Explain the catalytic properties of nanoparticles.
- ✓22. Mention different types carbon nanotubes. (8×2=16 Marks)

SECTION – C

Short essay (**Not** to exceed **120** words).

Answer **any 6** questions from the following. **Each** question carries **four** marks.

23. Explain free energy theory in metallic bonding.
24. AgCl is sparingly soluble in water while NaCl is soluble. Explain with respect to lattice energy.
25. Explain LCAO of H_2^+ ion.
- ✓26. Describe the theory behind ^{14}C dating.
- ✓27. A sample of uranium ore is found to contain 6.95g of ^{238}U and 6.15 g of ^{206}Pb . Calculate the age of the ore. The half-life of ^{238}U is 4.5×10^9 years.
- ✓28. Describe the use of HF as solvent.
- ✓29. Describe the applications of spectrophotometry.
- ✓30. Distinguish between top down and bottom to top approach for preparation of nanoparticles.
- ✓31. Discuss nanosystems in nature. (6×4=24 Marks)



SECTION – D
(Long Essay)

Answer **any 2** questions from the following. **Each** question carries **fifteen** marks.

- 32. a) State Fajan's rules.
b) Explain MO theory in O₂, N₂ and CO.
 - 33. a) Explain the use of isotopes as tracers.
b) Discuss various types of subatomic particles.
 - 34. Describe various instrumental methods and their applications like XRD, AFM, STM, SEM and TEM.
 - 35. Explain the methods for the preparation of nanoparticles. (2×15=30 Marks)
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