



Reg. No. :

Name :

First Semester B.Sc. Degree Examination, February 2018
First Degree Programme Under CBCSS

Chemistry

CH 1131.1/CH 1131.2 : THEORETICAL CHEMISTRY

(For Physics and Geology)

(2017 Admission)

Time : 3 Hours

Max. Marks : 80

SECTION – A

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

1. Write the electronic configuration of Calcium.
2. Different Quantum number values for 2p sub shell are
3. What is meant by common ion effect ?
4. Why completely and half filled orbitals are stable ?
5. Why the dipole moment of carbon dioxide is zero ?
6. In general, electro negativity _____ going left to right across a row in the periodic table.
7. What is the molecular geometry for ammonia (NH_3) ?
8. Define one curie.
9. Explain the term artificial transmutation.
10. What is meant by solubility product ?



SECTION - B

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

11. Explain Hund's rule with an example.
12. Derive the expression for spectral frequency from Bohr equation.
13. For an electron with angular quantum number $l = 2$, write the magnetic quantum number m values.
14. Define Soddy's displacement law.
15. Explain why Alcohol is soluble in water.
16. Explain the hybridization in IF_7 .
17. Explain the term bond order. What is its significance?
18. Explain neutron activation analysis.
19. What is n/p ratio? What is its significance?
20. What is dichrometric titration?
21. What are redox indicators? Give an example.
22. Explain radio carbon dating.

SECTION - C

(Answer **any six** questions. Each question carries 4 marks)

23. Explain principal quantum number and subsidiary quantum number. What is its significance?
24. Explain the theory of acid-base titration.
25. Explain inter molecular hydrogen bonds and intramolecular hydrogen bonds with examples.
26. Discuss MO diagram of HF .
27. Pd-100 has a half-life of 3.6 days. If one had 6.02×10^{23} atoms at the start, how many atoms would be present after 10.8 days?



28. Write a note on :
- Geiger-Muller counter
 - Wilson cloud chamber.
29. Give an example of :
- Proton
 - Neutron induced reactions.
30. Explain why acidic medium used in second group and alkaline medium is used in IVth group while in both groups ions are precipitated as sulphides ?
31. Explain paper chromatography.

SECTION - D

(Answer any two questions. Each question carries 15 marks)

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| 32. i) Explain hydrogen spectrum. | 5 |
| ii) Discuss the merits and demerits of Bohr atomic model. | 5 |
| iii) Explain Pauli's exclusion principle with an example. | 5 |
| 33. i) Compare the bond length and bond order of CO, CO ⁺ , CO ⁻ on the basis of MO diagrams. | 10 |
| ii) Briefly explain Paulings and Mullikan's scales of electronegativity. | 5 |
| 34. i) Explain the term Fricke dosimeter and Ceric sulphate dosimeter. | 5 |
| ii) What is nuclear fission and nuclear fusion ? | 5 |
| iii) Explain dsp ² hybridization with an example. | 5 |
| 35. i) Explain n/p ratio and it's significance. | 5 |
| ii) Discuss the titration curve for the titration of strong acid-weak base and weak acid-strong base. | 5 |
| iii) Explain the shape of SF ₆ on the basis of hybridization theory. | 5 |