M 7837

Reg. No. : ....

Name : ....

I Semester B.Sc. Degree (CCSS – Regular) Examination, November 2014
(2014 Admn.)
CORE COURSE IN CHEMISTRY
1B01 CHE : Theoretical and Inorganic Chemistry

Time: 3 Hours

Max. Marks : 40

SECTION – A

Answer **all** questions. **Each** question carries **one** mark.

1. Differentiate between accuracy and precision.

2. What are magic numbers ?

3. What is meant by Fermi level ?

4. State Pauli's exclusion principle.   (1×4=4)

SECTION – B

Answer **any seven** questions. **Each** question carries **2** marks.

5. Write Born Lande equation and explain the terms.

6. Correlate N/p ratio and nuclear stability.

7. What is meant by confidence limit ? What is its significance ?

8. Explain the importance of magnetic quantum number.

9. What are the differences between 2P and 3P orbital ?

10. State Heisenbergs uncertainty principle and explain probability on the basis of this.

11. Compare the bond lengths of $C-C$, $C=C$, $C \equiv C$.

P.T.O.

12. Explain standard deviation and relative standard deviation.

13. What are the limitations of free electron theory ?

14. What are significant figures ? List out the no. of significant figures in
    a) 0.000248   b) 400.8   (2×7=14)

SECTION – C

Answer **any 4** questions. **Each** question carries **3** marks.

15. What are determinate errors ? How are they minimized ?

16. Apply VSEPR theory to explain the shapes of NH_3, ClF_3, XeF_6.

17. State Fajans rules.

18. Explain the working of Wilson cloud chamber.

19. What are the postulates of Quantum mechanics ?

20. Given the masses of He nucleus, proton and neutron are 4.00820, 1.00758, 1.00897. Calculate the binding energy in Mev and in joules.   (4×3=12)

SECTION – D

Answer **any 2** questions. **Each** question carries **5** marks.

21. Explain the band theory of metals.

22. a) What are the postulates of Bohr theory ?

    b) Explain the hydrogen spectrum.

23. a) What are radioactive tracers ? Explain their application in the field of medicine and agriculture.

    b) What are cyclotrons ?

24. a) Explain f-test and t-test.

    b) Calculate the mean and standard deviation of the following sets of analytical results. 15.67, 15.69, 16.03.   (5×2=10)