TB1S5125F

Reg. No :.....

Name :.....

B.SC DEGREE (C.B.C.S.S) EXAMINATION, JANUARY 2019

(2016 Admission Supplementary)

SEMESTER V - CORE COURSE (CHEMISTRY)

CH5B07TB - NUCLEAR CHEMISTRY, METALLURGY AND CHEMICAL BONDING

Time : 3 Hours **Maximum Marks : 60**

Part A

I. Answer all questions. Each question carries 1 marks **(5x1=5)**

1. Name a radioactive isotope used to treat cancer.
2. Binding energy = mass defect × .....
3. ..... is the ore of Aluminium.
4. In molecular orbital concept, CO molecule is isoelectronic with ---------- molecule.
5. p-nitrophenol is having high boiling point due to ----------

Part B

II. Answer any Five questions. Each question carries 2 marks **(5x2=10)**

6. Nuclear fusion reactions are called thermonuclear reactions. Why?
7. A chain reaction is hindered after some time. Why?
8. What are alloys? How are they prepared?
9. Write the principle of zone refining?
10. Account for the high melting point of diamond.
11. Water has lower molecular weight among the hydrides of group VI elements, but has high boiling point. Explain.
12. Write Born-Lande equation and explain the terms.
13. Dipole moment of Boron triflouride is zero, whereas that of ammonia is 1.49D. Explain.

Part C

III. Answer any Five questions. Each question carries 5 marks **(5x5=25)**

14. Distinguish between natural and artificial radioactivity with examples.
15. Explain Geiger Nuttal rule.
16. Discuss the industrial applications of radioactive isotopes.
17. Will Mg reduce Aluminium oxide to Aluminium ? Elaborate.
18. Differentiate between calcination and roasting with examples.
19. Draw the molecular orbital energy level diagram of nitrogen molecule.
20. Compare valence bond theory and molecular orbital theory.
21. What is dipole moment? What are the factors affecting the polarizing ability of positive ions?

Part D

IV. Answer any Two questions. Each question carries 10 marks **(2x10=20)**

22. What are nuclear fission reactions? Discuss the release of energy in these reactions. Bring out the significance of critical mass in nuclear fission.
23. Explain the different steps in the extraction of Uranium in detail.
24. a. Briefly explain the preparation of synthetic elements. b. Outline Born-Haber cycle and show how is it useful in determining the lattice energy of magnesium fluoride crystal.
25. a. Write a note on radiotherapy b. Give a brief account of the theories of bonding in metals.