

B.A. / B.Sc. SEMESTER 2 EXAMINATION, 2020
FAKIR CHAND COLLEGE CENTRE (551)

INSTRUCTIONS FOR CANDIDATES

READ ALL THE INSTRUCTIONS CAREFULLY BEFORE WRITING ANSWERS

1. Total **TIME OF EXAMINATION: 2 HOURS**
2. **Question Paper Comprises Of Three Separate Questions – Theoretical (25 Marks), Practical (15 Marks) And Internal Examination (10 Marks). Candidates Must Have To Answer All The Three Separately And Finally Have To Prepare A Single pdf File By Scanning All The Papers Clearly And Serially (According To Page Numbers).**
3. **ATTACH ANYONE PREVIOUS SEMESTER ADMIT CARD** As The Last Page Of The pdf File
4. Use Only **WHITE PLAIN A4 PAPERS** For Writing Answers
5. Use **ONLY BLACK INK** For Writing Your Answers
6. Give **A TOP PAGE** With Clear Mention Of University **REGISTRATION NO. AND UNIVERSITY ROLL NO.** Of Anyone Previous Semester
7. **GIVE PAGE NO.** At The Top Right/Middle Of Each Page
8. Give **AT LEAST 1CM MARGINS** In All The Four Sides Of Each Page

2020
B.A. /B.Sc. Semester 2 Examination
University of Calcutta
CHEMISTRY – HONOURS
THEORETICAL
Paper : CC4
F.M. 25

FAKIR CHAND COLLEGE CENTRE(551)

Q.1 Answer ANY FOUR questions.

1X4

- a) What are magic numbers?
- b) What is nuclear spallation?
- c) Ozone molecule shows unusually low dipole moment. Comment.
- d) FeCl_3 is soluble in organic solvents like ether while AlCl_3 is insoluble. Explain.
- e) What is the kind of crystal defect observed when ZnO is heated?
- f) State Bent's rule.

Answer ANY THREE from Question Nos. 2 to 6.

- Q.2 a) Compare the nuclear fission and fusion processes showing relevant nuclear reactions. 4
- b) What is meant by artificial transmutation of elements? 3
- Q.3 a) Write down the Born-Landé expression of lattice energy for NaCl type of crystal and hence explain the terms involved therein. 4
- b) Explain Schottky defect with an example. 3
- Q.4 a) Using VSEPR theory, predict the shape of 4
- i) ClF_3 ii) BrF_4^- iii) I_3^-
- b) Discuss the trend in the solubility of MClO_4 ($\text{M} = \text{Li, Na, K}$). 3
- Q.5 a) From the plot of binding energy per nucleon vs mass number curve, explain why the lighter elements undergo fusion but heavier elements undergo fission. 4
- b) Write short notes on radiocarbon dating. 3
- Q.6 a) Construct the MO diagram of water molecule. 4
- b) What are n-type and p-type semiconductors? 3

2020
B.A. /B.Sc. Semester 2 Examination
University of Calcutta
CHEMISTRY – HONOURS
PRACTICAL
Paper : CC4
F.M. 15

FAKIR CHAND COLLEGE CENTRE(551)
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Answer ANY FOUR questions.

- | | |
|---|---|
| Q.1 Why is sodium thiosulphate a secondary standard? | 3 |
| Q.2 Write the reactions involved in the dissolution of brass. | 3 |
| Q.3 What is the role of starch in the iodine titrations? | 3 |
| Q.4 Write the reactions involved in the standardization of sodium thiosulphate using potassium dichromate solution. | 3 |
| Q.5 Write the reactions involved in the estimation of Vitamin C using iodometric titrations. | 3 |
| Q.6 What do you mean by available chlorine in bleaching powder? | 3 |

2020
B.A. /B.Sc. Semester 2 Examination
University of Calcutta
CHEMISTRY – HONOURS
INTERNAL EXAMINATION
Paper : CC4
F.M. 10

FAKIR CHAND COLLEGE CENTRE(551)

Answer all questions.

1x10

Q.1) The shape of XeF_4 molecule is

- a) square planar b) tetrahedral c) octahedral

Q.2) When Ga is added to Ge as an impurity

- a) a n-type semiconductor is formed b) a p-type semiconductor is formed
c) an insulator is formed

Q.3) Crystals of AgCl exhibit

- a) Schottky defect b) Metal excess defect c) Frenkel defect

Q.4) The solubility trend among the following sulphates is

- a) $\text{MgSO}_4 > \text{CaSO}_4 > \text{SrSO}_4 > \text{BaSO}_4$
b) $\text{MgSO}_4 < \text{CaSO}_4 < \text{SrSO}_4 < \text{BaSO}_4$
c) $\text{CaSO}_4 < \text{BaSO}_4 < \text{SrSO}_4 < \text{MgSO}_4$

Q.5) Which is not a magic number?

- a) 2 b) 12 c) 50

Q.6) The mesons have masses nearly

- a) 200 times the mass of an electron
b) 250 times the mass of an electron
c) 100 times the mass of an electron

Q.7) In nuclear reactors , the fissionable material is usually

- a) Uranium-255 b) Uranium-238 c) Uranium-235

Q.8) Bond order of a molecule is

- a) directly proportional to its bond length
b) inversely proportional to its bond length
c) not related to its bond length

Q.9) Which structure is derived from cubic-close packing of ions?

- a) Sodium chloride b) Wurtzite c) Rutile

Q.10) Madelung constant depends on

- a) electronic configuration of the ions b) geometry of the crystal
c) lattice energy of the crystal