

1B1N19017

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Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE  
 First Semester B.Sc Degree Examination, November 2019

**BCH1C01– General Chemistry**

(2019 Admission onwards)

Time: 2 hours

Max. Marks: 60

**Section A (Short answers)****(Answer questions up to 20 marks. Each question carries 2 marks)**Draw and explain the titration curve for HCl against  $\text{Na}_2\text{CO}_3$ .Calculate the absolute mass of one molecule of  $\text{O}_2$ .Describe the theory of external indicator method for the estimation of  $\text{FeSO}_4$  in dichrometry.

Write a balanced chemical equation for the permanganometric estimation of oxalic acid.

Ice floats on water. Give reasonable explanation.

Construct  $\sigma 2p_z$  and  $\sigma^* 2p_z$  molecular orbitals.

Distinguish between covalent bond and coordinate covalent bond.

How we can calculate lattice energy of an ionic compound?

Occupying molecular orbitals by electrons is in accordance with certain rules. Justify.

). U-238 and Th-232 can be converted to fissionable materials. Justify.

1. Describe some major functions of Zn containing enzymes.

2. Write the chemical reactions in photosynthesis.

**[Ceiling of marks: 20]****Section B (Paragraph)****(Answer questions up to 30 marks. Each question carries 5 marks)**

3. Elucidate the quinonoid theory of acid-base indicators.

4. Explain the theory behind redox indicators.

5. Describe the importance of solubility product in the separation of cations.

6. Line spectra of hydrogen can be explained with the help of Bohr Theory. Justify.

7. Write a note on various nuclear forces and explain the stability of nucleus.

8. Radioactive isotopes are used as tracers. Explain with examples.

9. Briefly explain the mechanism of  $\text{Na}^+/\text{K}^+$  pump.**[Ceiling of marks: 30]**

**Section C (Essay)**  
**(Answer any one. Each question carries 10 marks)**

1. a) From the molecular orbital electronic configurations prove that  $O_2^-$  is less stable than  $O_2$ .  
b) Describe the shape of  $IF_5$  and  $XeF_6$  using VSEPRT. (6+4)
2. a) Explain the determination of age of rocks from radiation measurements.  
b) Describe the structure of Hemoglobin. (5+5)

[1 x 10 = 10 Marks]

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FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

First Semester B.Sc Chemistry Degree Examination, November 2019

BCH1B01- Theoretical & Inorganic Chemistry - I

(2019 Admission onwards)

Time: 2 hours

Max. Marks: 60

**Section A (Short answers)**

**(Answer questions up to 20 marks. Each question carries 2 marks)**

1. Reviewing the literature is important in scientific research. Justify.
2. Name two CSIR institutions which will promote chemical research.
3. How we can dispose mercury and sodium in chemical laboratory?
4. Dichrometric and permanganometric titrations are redox reactions. Substantiate with example.
5. What are the precautions to be taken for safe handling of chemicals?
6. Explain the variation of ionization enthalpy along period and group.
7. Explain the factors that will favor the formation of ionic bond between two atoms.
8. Compounds with Pb in +4 oxidation state are strong oxidizing agents. Justify
9. How we can distinguish between hard acids and hard bases?
10. 150 mg of Co-60 of half life 5.26 years is accidentally disposed. Calculate the amount left after two years.
11. Briefly outline the theory of thermal diffusion method for separation of isotopes.
12. Lewis acidity of  $BI_3$  is higher than that of  $BF_3$ . Give reason

**[Ceiling of marks: 20]**

**Section B (Paragraph)**

**(Answer questions up to 30 marks. Each question carries 5 marks)**

13. Identify with example different kinds of thought process for the generation of hypothesis.
14. Explain with example the Quinonoid theory of acid-base indicators with example.
15. Calculate the volume of 85% w/w of  $\text{H}_2\text{SO}_4$  with density 1.7g/ml required to prepare 4L of 1N  $\text{H}_2\text{SO}_4$  solution.
16. Write a note on the structure and bonding in diborane.
17. Explain Lux-Flood concept of acids and bases. What are its limitations?
18. Illustrate the relation between radius ratio and structural arrangement.
19. Explain the structure and hybridization of  $\text{SO}_2$ .

**[Ceiling of marks: 30]**

**Section C (Essay)**

**(Answer any one. Each question carries 10 marks)**

20. Explain the theories behind redox, adsorption and complexometric indicators. (4+3+3)
21. a) Write a note on different types of nuclear forces.  
b) Radioactive isotopes can be used as tracers. Explain

**(5+5)**

**[1 x 10 = 10]**