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Register Number:

Name of the Candidate:

4321

**M.Sc. DEGREE EXAMINATION, May 2020**

**(CHEMISTRY)**

**(SECOND YEAR)**

**220: INORGANIC CHEMISTRY-II**

Time: Three hours

Maximum: 125 marks

**SECTION-A**

**(5×3=15)**

**Answer ALL questions**

1. What is residual current? How it arises?
2. How are X-rays produced?
3. Differentiate between trans effect and trans influence.
4. What are refractories? How are they classified?
5. Mention the advantages of gaseous fuels.

**SECTION-B**

**(5×10=50)**

**Answer ALL questions**

6. a) Explain the principle and application of cyclic voltammetry.  
(OR)  
b) Write down the principles involved in the determination of BOD and COD.
7. a) What is Auger effect? How Auger spectroscopy is applied for studying surfaces? Explain.  
(OR)  
b) i) Explain how electron diffraction is used to determine the crystal structure? (6+4)  
ii) List out the merits and demerits of neutron diffraction.
8. a) Describe the acid hydrolysis of octahedral Co(III) complexes.  
(OR)  
b) Why base hydrolysis of octahedral complexes cannot be explained by associative mechanism? Explain.
9. a) What are the essential conditions under which a substance can function as a good refractory material? Explain.  
(OR)  
b) What are silicones? Give their preparation, properties and uses.
10. a) i) Distinguish between solid, liquid and gaseous fuels. (5)  
ii) Differentiate between proximate and ultimate analysis of coal. (5)  
(OR)  
b) Describe the instrumentation and applications of gas-liquid chromatography.

**SECTION-C**

**(3×20=60)**

**Answer any THREE questions**

11. Discuss the method for the determination of the following:  
a) Alkalinity b) Chloride c) Fluoride d) Phosphate e) Sulphate
12. a) Explain the principle, instrumentation and applications of ESCA. (10)  
b) Discuss the principle and application of Mossbauer spectroscopy. (10)
13. Discuss the different theories proposed for explaining the trans effect.
14. a) Give the method of preparation, properties and structure of  $S_4N_4$  (8)  
b) Discuss the structural aspects of different types of silicates. (12)
15. a) Write short note on high-pressure liquid chromatography.  
b) Explain the followings:  
a) Optical rotatory dispersion b) Circular dichroism (10+10)

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