9. (a) Describe the basic principle of Cyclic Voltametry. 5

(b) Explain the working principle of AAS. 5

Or

10. Write short notes on the following : 5+5=10

(i) Polarography

(ii) Linear Sweep Voltametry and Square Wave Voltametry

*****

UG Odd Semester Examination, 2022

EDUCATION B.Sc. B.Ed

(7th Semester)

Course No.: BSCH-703

(Inorganic Chemistry)

Full Marks: 50

Pass Marks: 20

Time: 2 hours

The figures in the right margin indicate full marks for the question.
Answer the following five (5) questions

1. (a) Discuss the merits and demerits of Liquid Drop Model of Nucleus. 3

(b) What is magic number? What are the significance of Magic numbers? 3

(c) How nuclear reaction are different from ordinary chemical and physical changes? 2

(d) Write a nuclear equation for α-emission by polonium-210 used in radiation therapy. 2

Or

2. (a) Write nuclear equation for β-emission by Gold-198, used to assess kidney activity. 2

(b) Radan-222, which is found in the air inside houses built over soil containing uranium has a half life of 3.82 days. How long before a sample decrease to 1/32 of the original amount? 2

(c) What is Bahr magneton. 1

(d) Write a note on

(i) Carbon-14 dating (ii) α-radiation 3+2=5

3. (a) Provide all the symmetry elements and assign the point-group for following molecules. 1x4=4

(i) XeF_4, (ii) PCl_5, (iii) Cis-Platin

(iv) trans–$[PtCl_2(NH_3)_2]$

(b) What is improper axis of rotation? Explain the same with atleast one example. 2+2=4

(c) Which of the following molecules have center of inversion.

B_2H_6, PCl_5, NH_3, CO_2, HCl, XeF_4, CH_4, trans-1, 2-dichloroethene. 2

Or

4. (a) Define the term Symmetry element and symmetry operation with suitable example. 2+2=4

(b) Give one molecules with D_3 point group and show all the symmetry element present there. 2

(c) Explain D_{5h} point group with a suitable example. 2

(d) Comment on the point group of different orientation of H_2O_2. 2

5. (a) Why Borazin is known as inorganic benzene? Explain. 3

(b) Discuss the bonding in diborane. Why boranes are known as electron deficient compounds. 3+1=4

(c) Predict the structure of following metal clusters : 3

$Rh_6(CO)_{16}$, $Os_5(CO)_{15}$, $Os_3(CO)_{12}$

6. (a) Calculate the numbers of P=O and P–O bond present in P_4O_{10} and P_4O_6. Draw their structures. 1+1=2

(b) Comment on the structures of the following boron compounds. 2+2=4

$Cp_2Co_2B_4H_6$, $C_2B_{10}H_{12}$

(c) Calculate the styx numbers for following borane compounds. 2+2=4

B_6H_{10}, B_5H_{11}

7. (a) Describe the coordination environment of Fe(II) in Myeglobin. 3

(b) What is Bohrs Effect? 2

(c) Give three examples of nonheme iron-sulfur proteins that involves in electron transfer. Provide their compositions and structures. 2+3=5

Or

8. (a) Write short note on : 2+2=4

(i) In vivo nitrogen fixation

(ii) In vitro nitrogen fixation

(b) Discuss the importance of 'Se' in biological system. 2

(c) What are Sidemphores? Provide two examples with their structures. 1+3=4