

M.C.T.M.CC. HR SEC SCHOOL-KANADUKATHAN  
SECOND MID TERM MARCH-2021

**XII STD**  
MAX:50

**CHEMISTRY**  
TIME: 1.30 Hrs

**PART A**

**I.CHOOSE THE BEST ANSWER**

**10 X 1 =10**

1. In the electrolytic refining of copper, which one of the following is used as anode  
a. Pure copper b. Impure copper c. Carbon rod d. Platinum electrode

2. The geometry of which carbon atom in diamond are bonded to each other is  
a. Tetrahedral b. Hexagonal c. Octahedral d. None of these

3. Assertion:  $\text{La}(\text{OH})_3$  is less basic than  $\text{Lu}(\text{OH})_3$

Reason: Covalent character of  $\text{Ln}(\text{OH})_3$  decreases on moving from  $\text{La}^{3+}$  to  $\text{Lu}^{3+}$

- A and R are true and R is the correct explanation of A
- Both A and R are true and R does not explain A
- A is true but R is false
- Both A and R are false

4. Number of unpaired electrons in  $[\text{Ni}(\text{CN})_4]^{2-}$  complex is  
a. 0 b. 1 c. 2 d. 3

5. Solid  $\text{CO}_2$  is an example of

- Covalent solid b. Metallic solid c. Molecular solid d. Ionic solid

6. If the initial concentration of the reactant is doubled, the time for half reaction is also doubled. Then the order of the reaction is

- Zero b. One c. Fraction d. None

7. The amount of substance deposited at the electrode by a charge of 1 coulomb

- Equivalent weight b. Molecular weight c. Molar weight d. Electrochemical equivalent

8. Chemical species that differ only by a proton are called

- Proton donor b. Proton acceptor c. Electron donar d. Conjugate acid-base pair

9. Williamson synthesis of preparing di methyl ether is a / an

- $\text{SN}_1$  reaction
- $\text{SN}_2$  reaction
- Electrophilic addition
- Electrophilic substitution

10. On Kolbe electrolysis of sodium acetate, \_\_\_\_\_ is obtained at cathode.  
 a. Ethane b. Carbon dioxide c. Sodium d. Hydrogen

### Part-B

Answer any five (Q.No 18 is compulsory)

5 X 2=10

11. Write a short note on anomalous behaviour of first element of P block elements.
12. What is Bragg's equation? How will you calculate density of unit cell?  
[Equations only]
13. Which is more stable.  $\text{Fe}^{2+}$  or  $\text{Fe}^{3+}$ . Why?
14. Write the differences between Primary valency and secondary valency?
15. Calculate the pH of  $0.5 \times 10^{-3}\text{m}$  solution of  $\text{Ba}(\text{OH})_2$
16. How Acrolein is prepared?
17. Explain Arrhenius equation?
18. A solution of silver nitrate is electrolysed for 20 minute with a current of 2 amperes. Calculate the mass of silver deposited at the cathode.

### PART-C

Answer any 5 ( Q.No 26 is compulsory)

5 X 3=15

19. State Kohlraush law. Write its applications?
20. Convert a. Benzaldehyde to Benzoin b. Phenol to salicylic acid.
21. Write the equations involved in i. Mond process ii. Van-Arkel method
22. Why  $[\text{Cr}(\text{NH}_3)_6]^{3+}$  is paramagnetic while  $[\text{Ni}(\text{CN})_4]^{2-}$  is diamagnetic. Explain?
23. Derive Ostwald dilution law?
24. What is Popoff's rule. Give example?
25. Write notes on Schottky and Frenkel defect?
26. Show that in a first order reaction, the time required for 99.9% completion is nearly ten times the time required for half completion of the reaction?

### PART-D

Answer all the questions:

3 x 5 =15

27. a. Write the causes and consequences of Lanthanide contraction?  
 b. What are interstitial compounds. Give examples?  
 (or)  
 c. In the complex  $[\text{Pt}(\text{NO}_2)(\text{H}_2\text{O})(\text{NH}_3)_2]\text{Br}$   
 Identify a. Central metal ion b. Ligands c. Oxidation number of central metal ion.  
 d. What is Ethyl borate test?
28. a. Derive Henderson-Hasselbach equation?  
 b. Find the pH of a buffer solution containing 0.20 mole per litre sodium acetate and 0.18 mole per litre acetic acid,  $K_a$  for acetic acid is  $1.8 \times 10^{-5}$   
 (or)  
 c. Derive Half life period of first order reaction?  
 d. Explain the packing efficiency in BCC crystal?

29. a. Write notes on a. Perkin reaction b. Crossed aldol condensation  
b. Explain the mechanism of Cannizaro reaction.

(or)

c. A compound (A) with molecular formulae  $C_2H_3N$  on acid hydrolysis gives B which reacts with thionyl chloride to give C. Benzene reacts with compound C in presence of anhydrous  $AlCl_3$  give compound D. Compound D on reduction with  $Zn/Hg$  and  $Con.HCl$  gives E. Identify A, B, C, D and E.



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