# B.K. BIRLA CENTRE FOR EDUCATION

SARALA BIRLA GROUP OF SCHOOLS
A CBSE DAY-CUM-BOYS' RESIDENTIAL SCHOOL

## TERM-1 EXAMINATION 2026-27

### CHEMISTRY (043) SET-1 (ANSWER KEY)

Class: XII Duration : 3 Hrs
Date:07/09/26 Max. Marks: 70
Name: Exam Roll No.:

.

## SECTION A

1. (b) 0.1 M $Na_3PO_4$ 1

2. (a) Cellulose acetate 1

3. (a) 6F 1

4. (a) 38% 1

5. (b) zero

6. (c) lit $mol^{-1}$ $sec^{-1}$

7. (a) +3

8. (c) $Zr^{4+}$, $Hf^{4+}$

9. (a) +3

10. (b) Potassium hexacyanidoferrate (III)

11. (b) SN2 mechanism

12. (b) Fitting Reaction

13. a. 14. A 15. A 16. d.

## SECTION B

**This section contains 5 questions with internal choice in one question. The following questions are very short answer type and carry 2 marks each.**

17. (a) It has $4s^1$ 1 (b) due to unpaired electron. `1

18. How much charge is required for the following reductions: 2
(a) 3F (b) 2F

19. (a) K/mole.Kg
(b) negative deviation 2

20. rate = $[A]^1[B]^1$ 1

average rate is the concentration per unit time taken and the instantaneous rate is the concentration at particular moment of time 1

OR

Bimolecular but first order reaction is called pseudo first order reaction . [1]

Hydrolysis of ester [1]

21. octahedral sp3d2 or d2sp3 2

## SECTION C

**This section contains 7 questions with internal choice in one question. The following questions are short answer type and carry 3 marks each.**

22. Write the major product(s) in the following: 3

(a) pent-2-ene

(b) vic di bromide

(c) $C_6H_5(CH_2Cl$

23. (a) 3

4-bromo 3 methyl pent2ene

(b)

$C_6H_5CH_2Br(4)$, $C_6H_5C(CH_3)(C_6H_5)Br$ (1), $C_6H_5CH(C_6H_5)Br(2)$, $C_6H_5CH(CH_3)Br(3)$

(c) $3^0 > 2^0 > 1^0$

24. **Apply Nernst Equation**

Use the Nernst equation

A voltaic cell is set up at 25°C with the following half cells:

The cell potential of the given voltaic cell is **(3.19 V)**

**1**

25. (a) Name the following coordination compounds according to IUPAC system of nomenclature. 3

(i) aqua chloridodiamminecobalt (iii) chloride

(ii) dichlorido disulphato chromate(vii) chloride

(b) $t_{2g}^4$ and $e_g^0$

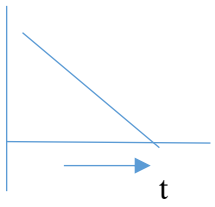
26. 3

(i) first

(ii) -Conc/time

(iii) sec-1

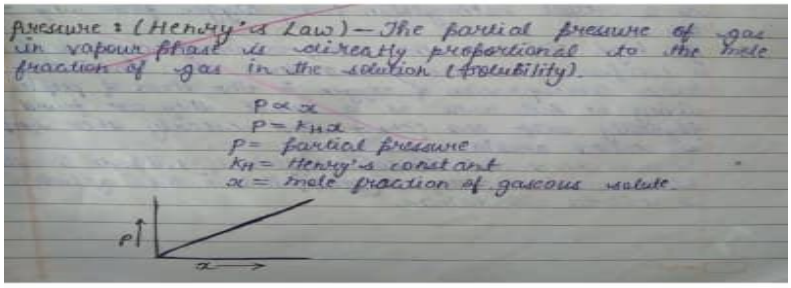
**[A]**



27. Explain by giving reasons: 3

(a) unpaired
(b) unpaired
(c) multiple OS

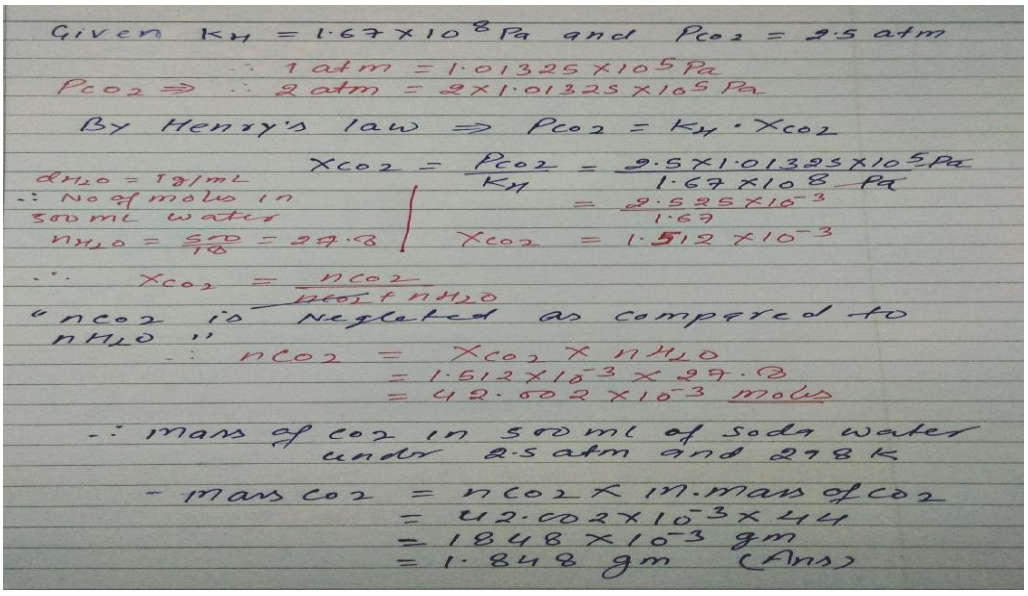
28 . State Henry's law and mention two of its important applications.






3

OR




**SECTION D**

**The following questions are case-based questions. Each question carries 4 marks. Read the passage carefully and answer the questions that follow**

29. (a) $A=e^{-Ea/RT}$ $Ea/2.303[1/T1-1/T2]$ 2

(b) amount of energy req to promote reactant to the product. Fraction of molecules 2

OR

(b) rate = 0.1 /10 mol per minute 2

30
(a) oxidation state of Ni is 0 1
(b) Out Cis - $[Pt(en)_2 CI_2]^{2+}$ 1
(c) $[Cr(H_2O)6]$ Cl2 2

OR

(c) lone pair or negative charge containing group is called ligand and metal which has more number of bond is called central metal. 2

## SECTION E

The following questions are long answer type and carry 5 marks each. All questions have an internal choice.

31 **a) n-Butyl chloride + alcoholic KOH**: Forms **but-1-ene** via a dehydrohalogenation (elimination) reaction.

**(b) Bromobenzene + Mg (dry ether)**: Forms **phenylmagnesium bromide**, which is a Grignard reagent.

**(c) Chlorobenzene + hydrolysis**: No reaction occurs under normal conditions; requires harsh conditions of **623 K** and **300 atm** pressure with aqueous NaOH to yield **phenol**.

**(d) Ethyl chloride + aqueous KOH**: Undergoes nucleophilic substitution to form **ethanol**.

**(e) Methyl chloride + KCN**: Undergoes nucleophilic substitution to form **methyl cyanide**

OR

(a) KCN is ionic and AgCN is covalent in nature
2+3

(b) (i) Conc H2SO4
(ii) Reduction / AgNO2
(iii) Cl2/sunlight /aq KOH

32.a A lead storage battery consists of a lead anode, a grid of lead packed with lead oxide ($PbO_2$) as the cathode, and a 38% solution of sulphuric acid ($H_2SO_4$) as an electrolyte.

When the battery is in use, the following cell reactions take place:

At anode: $Pb_{(s)} + SO^{2-}{}_{4(aq)} \rightarrow PbSO_{4(s)} + 2e^-$

At cathode:

$$PbO_{2(s)} + SO_4^{2-}{}_{(aq)} + 4H^+{}_{(aq)} + 2e^- \longrightarrow PbSO_{4(s)} + 2H_2O_{(l)}$$

The overall cell reaction is given by,

$$Pb_{(s)} + PbO_{2(s)} + 2H_2SO_{4(aq)} \longrightarrow 2PbSO_{4(s)} + 2H_2O_{(l)}$$

When a battery is charged, the reverse of all these reactions takes place.

Hence, on charging, present at the anode and cathode is converted into and respectively.

3

(b) The standard electrode potential for Daniel cell is 1.1 V. Calculate the standard Gibbs energy for the

$$Zn_{(s)} + Cu^{2+}{}_{(aq)} \rightarrow Cu_{(s)} + Zn^{2+}{}_{(aq)}$$

So, here value of $n = 2$

$$\Delta G^\circ = -nFE^\circ{}_{cell}$$

$$= -(2 \text{ mol})(96500 \text{ C mol}^{-1} \times 1.10 \text{ V})$$

$$= -212{,}300 \text{ CV}$$

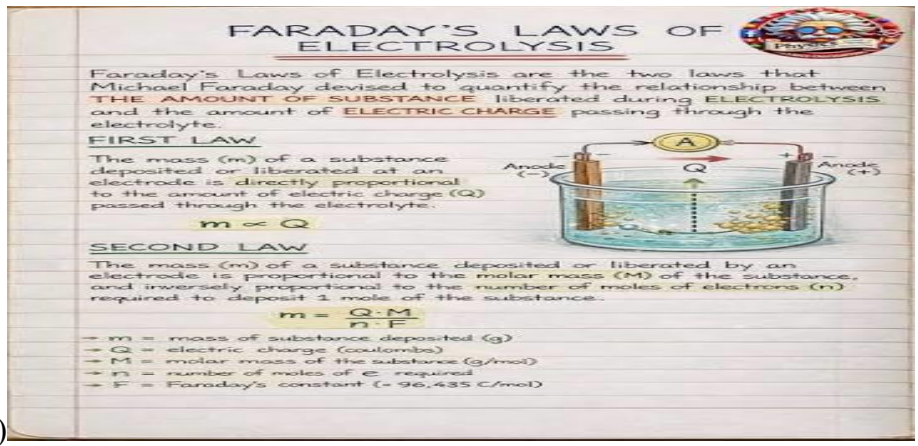
$$= -212{,}300 \text{ J} = -212.30 \text{ kJ}$$

(Coulomb × Volt = Joule)

2

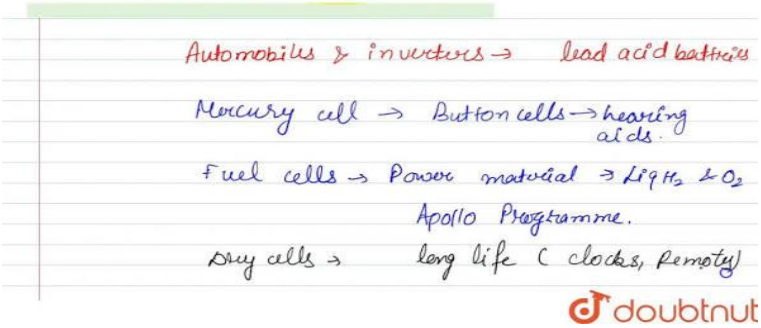
Or

(a)



2

(b)




33.

$$\underset{\text{(A)}}{4FeCr_2O_4} + 8Na_2CO_3 + 7O_2 \longrightarrow \underset{\text{(B)}}{8Na_2CrO_4} + 2Fe_2O_3 + 8CO_2$$

$$2NaCrO_4 + 2H^+ \longrightarrow Na_2Cr_2O_7 + 2Na^+ + H_2O$$

$$\underset{\text{(C)}}{Na_2Cr_2O_7} + 2KCl \longrightarrow \underset{\text{(D)}}{K_2Cr_2O_7} + 2NaCl$$

5

OR

$$\underset{\text{(A)}}{2\ MnO_2} + 4KOH + O_2 \longrightarrow \underset{\text{(B)}}{2K_2MnO_4} + 2H_2O$$

$$3MnO_4^{2-} + 4H^+ \longrightarrow \underset{\text{(C)}}{2MnO_4^-} + MnO_2 + 2H_2O$$

$$2MnO_4^- + H_2O + KI \longrightarrow \underset{\text{(A)}}{2MnO_2} + 2OH^- + \underset{\text{(D)}}{KIO_3}$$

**********ALL THE BEST**********