Tsi12C

Tenkasi District Common Examinations
Second Revision Test - January 2023

30-01-2023

Standard 12

Time Allowed: 3.00 Hours

CHEMISTRY

Maximum Marks: 70

PART - I

I. Note: i) Answer all the questions. **15×1=15**
ii) Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer.

1) Which of the following reduction is not thermo dynamically feasible?
a) $Cr_2O_3+2Al \rightarrow Al_2O_3+2Cr$ b) $3TiO_2+4Al \rightarrow 2Al_2O_3+3Ti$
c) $Al_2O_3+2Cr \rightarrow Cr_2O_3+2Al$ d) None of these

2) Producer gas is _____.
a) H_2+CO b) $CO+N_2$ c) H_2O+CO d) None of these

3) **Match it:**

A) Hyponitrous acid	-	i)	+7
B) Pernitrous acid	-	ii)	+1
C) Pernitric acid	-	iii)	+2
D) Hydronitrous acid	-	iv)	+5

	A	B	C	D
a)	(ii)	(iv)	(iii)	(i)
b)	(iv)	(ii)	(i)	(iii)
c)	(iv)	(i)	(ii)	(iii)
d)	(ii)	(iv)	(i)	(iii)

4) Which of the following lanthanoid ions is diamaganetic?
a) Eu^{2+} b) Yb^{2+} c) Ce^{2+} d) Sm^{2+}

5) A magnetic moment of 1.73 BM will be shown by one among the following.
a) $TiCl_4$ b) $[COCl_6]^{4-}$ c) $[Cu(NH_3)_4]^{2+}$ d) $[Ni(CN)_4]^{2-}$

6) The vacant space in bcc lattice unit cell is _____.
a) 48% b) 23% c) 32% d) 26%

7) For a first order reaction, the rate constant is 6.909 min^{-1}. The time taken for 75% conversion in minutes is _____.
a) $\left(\frac{3}{2}\right)\log 2$ b) $\left(\frac{2}{3}\right)\log 2$ c) $\left(\frac{3}{2}\right)\log\left(\frac{3}{4}\right)$ d) $\left(\frac{2}{3}\right)\log\left(\frac{4}{3}\right)$

8) $H_2PO_4^-$ is the conjugate base of
a) PO_4^{3-} b) P_2O_5 c) H_3PO_4 d) HPO_4^{2-}

9) The cell emf value for mercury button cell is _____.
a) 1.5V b) 1.35V c) 1.8V d) 2V

10) Which one of the following is correctly matched?
a) emulsion - smoke
b) gel - butter
c) foam - mist
d) whipped cream - sol

11) Glycerol on oxidation with _____ gives formaldehyde and formic acid.
a) Conc.HNO_3 b) Br_2/H_2O c) HIO_4 d) $KMnO_4$

12) In which of following reaction new carbon-carbon bond is not formed?
a) Aldol condensation b) Friedal craft reaction
c) Kolbe's reaction d) Wolf - Kishner reduction

13) $C_6H_5N_2Cl + C_6H_5NH_2 \xrightarrow[273-278\ K]{pH\ (4-5)}$?
a) p - hydroxy azobenzene b) p - amino azobenzene
c) p - hydroxy phenyl hydrazine d) 2 - phenyl azo 4 - methyl phenol

14) Which of the following vitamin deficiency causes muscular dystrophy?
a) Vitamin K b) Vitamin E c) Vitamin A d) Vitamin B

15) Which of the following is not a bio-degradable polymer?
a) PHB b) PGA c) PCL d) HDPE

PART - II

II. Answer ANY SIX questions. Question No. 20 is compulsory: **6×2=12**

16) Explain the following terms with suitable examples.
(i) Gangue (ii) Slag

17) What are the uses of phosphine?

18) Write the electronic configuration of Ce^{4+} and CO^{2+}.

19) Classify the following ligand based on the number of donor atoms.
a) NH_3 b) en c) Ox^{2-} d) Pyridine

20) The activation energy of a reaction is 22.5 K cal mol^{-1} and the value of rate constant at 40°C is 1.8×10^{-6} s^{-1}. Calculate the frequency factor A.

21) What is HVZ reaction?

22) **Complete the following reaction:**

i) $C_2H_5NH_2 + HNO_2 \longrightarrow$ ii) $C_6H_5NH_2 + HNO_2 \xrightarrow{273K - 278K}$

23) What is the selective reduction of polynitro compounds?

24) What are fat-soluble vitamins?

PART - III

III. Answer ANY SIX questions. Question No. 30 is compulsory: **6×3=18**

25) Give short note on Calcination.

26) What is the hybridisation of Iodine in IF_7? Give its structure.

27) What are the uses of coordination complexes in medical field?

28) Calculate the packing efficiency of face - centered cubic lattice (fcc).

29) What are elementary reaction? Give the differences between order and molecularity of a reaction.

30) Calculate the concentration of OH^- ion in a fruit juice, which contains 2×10^{-3}M H_3O^+ ion. Identify the nature of the solution.

31) Differentiate Vanderwaals adsorption and aetivated adsorption.

32) How will you differentiate 3 types of alcohols by catalytic hydrogenation reaction?

33) How will you conduct the following changes?
a) Acetone → Diacetone amine
b) Formaldehyde → Hexamethylene tetramine
c) Benzaldehyde → Hydro benzamide

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PART - IV

IV. Answer ALL the questions: **5×5=25**

34) a) What is Autoreduction? **(2)**
b) Explain the zone refining process. **(3)**

(OR)

c) **Complete the following reactions:** **(5)**
(i) $Zn+HCl \rightarrow$ (ii) $SiO_2+4HF \rightarrow$ (iii) $Xe+F_2 \xrightarrow[Ni]{400^oC}$
(iv) $HCOOH+Conc.H_2SO_4 \rightarrow$ (v) $Cu+4HNO_3 \rightarrow$

35) a) How Cl_2 is prepared by Deacon's process? **(3)**
b) Which is more basic $La(OH)_3$ and $Lu(OH)_3$? Why? **(2)**

(OR)

c) What is Linkage isomerism? Explain with an example. **(3)**
d) What is crystal field stabilization energy? (CFSE) **(2)**

36) a) Give short note on Schottky defect. **(3)**
b) An atom crystallises in fcc crystal lattice and has a density of 10g cm^{-3} with cell edge length of 100 pm. Calculate the number of atoms present in 1g of crystal. **(2)**

(OR)

c) Derive integrated rate law for a zero order reaction A → product. **(3)**
d) The rate constant of a reaction at 400k and 200k are 0.04 and 0.02s^{-1} respectively. Calculate the value of activation energy. **(2)**

37) a) Derive the Nernst equation. **(3)**
b) A solution of Silver nitrate is electrolysed for 20 minutes with a current of 2 amperes. Calculate the mass of silver deposited at all cathode. **(2)**

(OR)

c) Describe some features of catalysis by Zeolites. **(3)**
d) Write short note on catalytic poison. **(2)**

38) a) A dibromo derivative (A) on treatment with KCN followed by acid hydrolysis and heating gives a monobasic acid (B) along with liberation of CO_2. (B) on heating with liquid NH_3 followed by treating with Br_2/KOH gives (C) which on treating with $NaNO_2$ and HCl at low temperature followed by oxidation gives a monobasic acid (D) having molecular mass 74. Identify (A) to (D). **(5)**
b) Classify the following as linear, branched or cross - linked polymers. **(3)**
(i) Bakelite (ii) Nylon - 6, 6 (iii) LDPE (iv) HDPE

(OR)

c) Write the zwitter ion structure of alanine. **(2)**
