

12

Register No.

Time 3.00 Hrs.

Half-Yearly Examination - 2023

CHEMISTRY

Marks 70

PART - I

15 x 1 = 15

Answer all the questions. Choose the correct answer from the given four alternatives.

- Pure Nickel is obtained from impure Ni by
a) carbon reduction b) Reduction using silver c) Mond's process d) Van-Arkel method
- Carbon atoms in graphene is.....hybridised
a) sp^3 b) sp c) sp^2 c) partially sp^2 and partially sp^3 hybridised
- Which one of the following orders is correct for the bond dissociation enthalpy of halogen molecules?
a) $Br_2 > I_2 > F_2 > Cl_2$ b) $F_2 > Cl_2 > Br_2 > I_2$ c) $I_2 > Br_2 > Cl_2 > F_2$ d) $Cl_2 > Br_2 > F_2 > I_2$
- Which of the following lanthanoid ion is diamagnetic?
a) Eu^{+2} b) Ce^{+2} c) Sm^{+2} d) Yb^{+2}
- Which one of the following will give a pair of enantiomorphs?
a) $[Cr(NH_3)_6][CO(CN)_6]$ b) $[CO(en)_2Cl_2]Cl$ c) $[Pt(NH_3)_4][PtCl_4]$ d) $[CO(NH_3)_4Cl_2]NO_2$
- The occupied space in bcc lattice unit cell is
a) 52.38% b) 68% c) 74% d) 32%
- In a first order reaction $x \rightarrow y$; if k is the rate constant and the initial concentration of the constant x is 0.1 M, then the half life is a) $\left(\frac{\ln 2}{k}\right)$ b) $\left(\frac{\log 2}{k}\right)$ c) $\left(\frac{0.693}{(0.1)k}\right)$ d) $\left(\frac{k}{\ln 2}\right)$
- The POH of 10^{-5} M KOH solution will be
a) 9 b) 5 c) 14 d) 6
- While charging lead storage battery
a) $PbSO_4$ on cathode is reduced to Pb b) $PbSO_4$ on anode is oxidised to PbO_2 c) $PbSO_4$ on anode is reduced to Pb
d) $PbSO_4$ on cathode is oxidised to Pb.
- Match the following

A) V_2O_5	-	HDPE
B) Zieger-Natta	-	PAN
C) Peroxide	-	NH_3
D) Finely divided Fe	-	H_2SO_4

	A	B	C	D
a)	(iv)	(i)	(ii)	(iii)
b)	(i)	(ii)	(iv)	(iii)
c)	(ii)	(iii)	(iv)	(i)
d)	(iii)	(iv)	(ii)	(i)
- Among the following ethers which one will produce methyl alcohol on treatment with not HI?
a) $(CH_3)_2 - CH - CH_2 - O - CH_3$ b) $(CH_3)_3 - C - OCH_3$ c) $CH_3 - (CH_2)_3 - O - CH_3$
d) $CH_3 - CH_2 - CH - O - CH_3$

CH_3
- In the following reaction,

$$CH \equiv CH \xrightarrow[HgSO_4]{H_2SO_4} \text{'X' product 'X' is}$$

a) Formaldehyde	b) acetaldehyde	c) Acetone	d) Ethanol
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- The product formed by the reaction an aldehyde with a primary amine.
a) Carboxylic acid b) aromatic acid c) Schiff's base d) ketone
- The number of sp^2 and sp^3 hybridised carbon in fructose are respectively
a) 1 and 4 b) 4 and 2 c) 5 and 1 d) 1 and 5
- Natural rubber has
a) alternate cis and trans-configuration b) random cis and trans-configuration
c) all cis-configuration d) all trans-configuration

PART - II

6 x 2 = 12

Answer any 6 questions. Q.No.24 is compulsory.

- What is the role of quick lime in the extraction of iron from its oxide Fe_2O_3 ?
- Write the reason for the anomalous behaviour of nitrogen.
- Write the electronic configuration of Ce^{+4} and Co^{+2} .
- Define Ostwald dilution law.
- Write a note on denaturation of proteins.

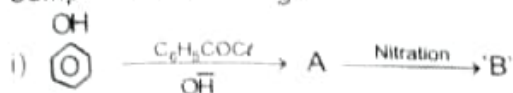
21. Explain why Cr^{2+} is strongly reducing while Mn^{3+} is strongly oxidising.
22. Write a note on (i) Mustard-oil reaction (ii) coupling reaction.
23. How the tranquilisers work in body.
24. An element has bcc structure with a cell edge of 288 pm. The density of the element is 7.2 g cm^{-3} . How many atoms are present in 208 g of the element.

PART - III

Answer any six questions. Question number 33 is compulsory.

6 x 3 = 18

25. Write a note on zeolites.
26. Compare lanthanoids and actinoids.
27. 0.1 M NaCl solution is placed in two different cells having cell constant 0.5 and 0.25 cm^{-1} respectively. Which of the two will have greater value of specific conductance.
28. Describe adsorption theory of catalysis.
29. Write the mechanism of Aldol - condensation.
30. How will you distinguish 1° , 2° , & 3° alcohols by Victor-Meyer's Test?
31. Explain pseudo first order reaction with an example.
32. On the basis of VB theory explain the complexes.
- i) $[\text{Ni}(\text{CN})_4]^{2-}$ ii) $[\text{CoF}_6]^{3-}$
33. Complete the following.



PART - IV

5 x 5 = 25

Answer all the questions

34. a) i) Explain magnetic separation method. (3)
ii) Give the uses of Alum. (2)
- (OR)
- b) (i) Describe the preparation of potassium dichromate. (3)
(ii) Give a reason to support that sulphuric acid is dehydrating agent. (2)
35. a) i) Write the postulates of Werner's theory (3)
ii) Calculate the number of atoms in a fcc unit cell. (2)
- (OR)
- b) (i) Derive integrated rate law for a zero order reaction $\text{A} \rightarrow \text{product}$ (3)
ii) Explain common ion effect with an example. (2)
36. a) i) State Kohlrausch law. How is it useful to determine the molar conductivity of weak electrolyte at infinite dilution (3)
ii) Write a cell notation for Galvanic cell (2) (OR)
- b) (i) Differentiate physisorption and chemisorption. (3)
ii) Write a note on electrophoresis. (2)
37. i) Convert propane 1, 2, 3-triol to acrolein ($1\frac{1}{2}$)
ii) Write a note on Williamson ether synthesis. ($1\frac{1}{2}$)
iii) What is Urotropine? Write the preparation method of urotropine. (2)
- (OR)
- b) Account for the following.
- i) Aniline does not undergo Friedel - Crafts reaction ($1\frac{1}{2}$)
ii) Amines are more basic than amides. ($1\frac{1}{2}$)
iii) What is Chloropicrine? How is it prepared? (2)
38. a) (i) Explain the structure of glucose (4)
ii) Name the vitamins whose deficiency cause (i) rickets (ii) scurvy (1)
- (OR)
- b) (i) How is Nylon-66 prepared? ($1\frac{1}{2}$)
(ii) What are artificial sweetening agents? Give example. ($1\frac{1}{2}$)
(iii) Give the differences between primary and secondary structure of proteins. (2)