

CAREER POINT MOCK TEST PAPER

CENTRAL BOARD OF SENIOR SECONDARY EXAMINATION

SET-1

Series CPC

Code No. **16/1/C**

Roll No.

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Candidates must write the Code on the title page of the answer-book

- Please check that this question paper contains 6 printed pages.
- Code number given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate
- Please check that this question paper contains **30** questions.
- Please write down the Serial Number of the question before attempting it.
- 15 minute time has been allotted to read this question paper. The students will read the question paper only and will not write any answer on the answer-book during this period.

CHEMISTRY (Theory)

Time allowed: 3 hours

Maximum Marks : 70

P.T.O

General Instructions:

1. All questions are compulsory.
 2. Question no. 1 to 8 are **very short answer questions** and carry **1 mark** each.
 3. Question no. 9 to 18 are **short answer questions** and carry **2 marks** each.
 4. Question no. 19 to 27 are **also short answer questions** and carry **3 marks** each.
 5. Question no. 28 to 30 are **long answer questions** and carry **5 marks** each
 6. Use log tables if necessary, use of calculators is not allowed.
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Very short answer type question (Q.1 to Q.8)

- Q.1** A and B liquids on mixing produce a warm solution. Which type deviation from Raoult's law is there ? [1]
- Q.2** Why is Ferric chloride preferred over Potassium Chloride in case of a cut leading to bleeding ? [1]
- Q.3** What happens when cane sugar is hydrolysed ? [1]
- Q.4** In solid state PCl_5 behaves as an ionic species give reason [1]
- Q.5** Mention two froth stabilizers used in froth floatation process [1]
- Q.6** Why is sulphuric acid not used during the reaction of alcohols with KI ? [1]
- Q.7** Give the equations of reactions for the preparation of phenol from cumene. [1]
- Q.8** Write the structural formula of 1- phenylpentan-1-one [1]

Short answer type question (Q. 9 to Q.18)

Q.9 Classify each of the following as being either a p-type or an n-type semi-conductor. Give reason- [2]
(a) Si doped with In (b) Si doped with P

Q.10 Describe the construction of a H₂-O₂ fuel cell and the reactions taking place in it. [2]

OR

Define the terms given below-

(a) Conductivity

(b) Molar conductivity

What are their units ?

Q.11 On dissolving 19.5 g of CH₂FCOOH in 500g of water, a depression of 1°C in freezing point of water is observed. Calculate the Van't Hoff factor and dissociation constant of fluoro acetic acid. [2]
Given $K_f = 1.86 \text{ K kg mol}^{-1}$

Q.12 (a) Heat of adsorption is greater for chemisorption than for physisorption. Why ? [2]
(b) Mention two common properties of sol and emulsions
(c) Differentiate between electrophoresis and electro-osmosis

Q.13 Determine the molarity of an antifreeze solution containing 250 g water mixed with 222 g ethylene glycol (C₂H₆O₂). The density of this solution is 1.07 g/ml. [2]

Q.14 (a) State the role of silica in the metallurgy of copper. [2]
(b) Differentiate between roasting and calcinations

Q.15 Draw the shapes of the following compounds: [2]
(a) SF₄ (b) XeF₂

Q.16 Explain giving reason [2]
(a) The enthalpies of atomization of the transition metals are high
(b) Transition metals in their many compounds act as good catalyst

Q.17 Predict, giving reasons, the order of basicity of the following compounds in (i) gaseous phase and (ii) in aqueous solutions [2]
(CH₃)₃ N, (CH₃)₂ (NH), CH₃NH₂, NH₃

Q.18 Account for the following : [2]
(a) Aniline does not undergo Friedel Crafts alkylation
(b) Although-NH₂ group is an ortho and para-directing group, nitration of aniline gives alongwith ortho and para-derivatives meta-derivative also.

Short answer type question (Q. 19 to Q.27)

- Q.19** (a) Two electrolytic cells containing silver nitrate solution and dilute sulphuric acid solution were connected in series. A steady current of 2.5 amp was passed through them till 1.078 g of silver was deposited. [$\text{Ag} = 107.8 \text{g mol}^{-1}$, $F = 96,500 \text{C}$]
- (i) How much electricity was consumed ?
- (ii) What was the weight of oxygen gas liberated ?
- (b) Give reason-
- (i) The equilibrium constant K is related to E_{cell}^0 and not E_{cell} .
- (ii) Conductivity of an electrolytic solution decreases with the decreases in concentration [3]

OR

- (a) What is a fuel cell ? What is its main advantage ?
- (b) What are the reactions occurring at the cathode and anode of a Leclanche cell ?
- (c) In the button cell widely used for watches and other devices, the following reaction takes place-
- $$\text{Zn(s)} + \text{Ag}_2\text{O(s)} + \text{H}_2\text{O(l)} \longrightarrow \text{Zn}^{2+}(\text{aq}) + 2\text{Ag(s)} + 2\text{OH}^-(\text{aq})$$
- Give the cell representation and determine the value of K_c for the above reaction using the following data-
- $$\text{Ag}_2\text{O(s)} + \text{H}_2\text{O(l)} + 2\text{e}^- \longrightarrow 2\text{Ag(s)} + 2\text{OH}^-(\text{aq}) \quad (E^0 = 0.344\text{V})$$
- $$\text{Zn}^{2+}(\text{aq}) + 2\text{e}^- \longrightarrow \text{Zn(s)} \quad (E^0 = -0.76\text{V})$$

- Q.20** (a) Give one main difference between lyophilic and lyophobic colloids
- (b) What is observed when
- (i) A beam of light is passed through a colloidal solution.
- (ii) Electric current is passed through a colloid solution. [3]

- Q.21** (A) What is denaturation of protein
- (B) What is difference between nucleotide & nucleoside
- (C) What is isoelectric point [3]

- Q.22** (A) Define the terms thermoset polymer and thermoplastic. Give one example of each
- (B) How will you prepare the following ? Give chemical reaction only
- (i) PVC (ii) PAN (iii) Terylene (iv) Buna-S [3]

- Q.23** (A) Write the structural formula of the following compounds- [3]
- (i) Aspirin (ii) Paracetamol (iii) Bithionol (iv) Chloroxylenol
- (B) What are antacids? List some compounds which are used as antacids ?

- Q.24** (a) Among ionic species Sc^{+3} , Ce^{+4} and Eu^{+2} , which one is a good oxidizing agent
 (b) Complete the following reactions: [3]
 (i) $\text{Cr}^{2+} \text{O}_7^{2-} + \text{Sn}^{+2} + \text{H}^+ \rightarrow$
 (ii) $\text{MnO}_4^- + \text{Fe}^{+2} + \text{H}^+ \rightarrow$
- Q.25** (a) Which isomer of $[\text{Co}(\text{en})_2 \text{Cl}_2]^+$ does not show optical isomerism ?
 (b) $[\text{NiCl}_4]^{2-}$ is paramagnetic while $[\text{Ni}(\text{CO})_4]$ is diamagnetic though both are tetrahedral why ? [3]
- Q.26** Explain as to why haloarenes are much less reactive than haloalkanes towards nucleophilic substitution reactions. [3]

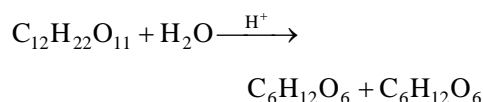
OR

Which compound in each of the following pairs will react faster in $\text{S}_{\text{N}}2$ reaction with OH^- ? Why ?

- (i) CH_3Br or CH_3I
 (ii) $(\text{CH}_3)_3\text{CCl}$ or CH_3Cl
- Q.27** Give chemical tests to distinguish between compounds in each of the following pairs [3]
 (i) Phenol and Benzyl alcohol
 (ii) Butane-2-ol and 2-Methyl propan-2-ol

Long answer type question (Q.28 to Q.30)

- Q.28** For the reaction



Write :

- (i) Rate of reaction expression (ii) rate law equation
 (iii) molecularity (iv) order of reaction
- (b) The following data were obtained during the first order thermal decomposition of SO_2Cl_2 at constant volume-



Experiment	Time/s	Total pressure/atm
1	0	0.5
2	100	0.6

Calculate the rate of reaction when total pressure is 0.65 atm. [5]

OR

- (a) Illustrate graphically the effect of catalyst on activation energy.
 (b) Catalysts have no effect on the equilibrium constant. Why ?
 (c) The decomposition of A into product has value of k as $4.5 \times 10^3 \text{ s}^{-1}$ at 10°C and activation energy is 60 kJ mol^{-1} . Calculate the temperature at which the value of k will be $1.5 \times 10^4 \text{ s}^{-1}$

Q.29 (a) Assign reasons for the following: [5]

(i) The acidic strengths of acids increases in the order: $\text{HF} < \text{HCl} < \text{HBr} < \text{HI}$

(ii) H_3PO_2 behaves as a monoprotic acid

(b) Complete following reactions:

(i) $\text{Pb}(\text{NO}_3)_2 \xrightarrow{\Delta}$

(ii) $\text{XeF}_2 + \text{H}_2\text{O} \longrightarrow$

(iii) $\text{Ca}_3\text{P}_2 + \text{H}_2\text{O} \longrightarrow$

Q.30 (a) How will you bring about the following conversions ?

(i) Ethanol to 3-hydroxybutanal

(ii) Benzaldehyde to Benzophenone

(b) An organic compound A has the molecular formula $\text{C}_8\text{H}_{16}\text{O}_2$. It gets hydrolysed with dilute sulphuric acid and gives a carboxylic acid B and an alcohol C. Oxidation of C with chromic acid also produced B. C on dehydration reaction gives but-1-ene. Write equations for the reactions involved. [5]