

Guess Paper – 2014
Class – XII
Subject – Chemistry

GENERAL INSTRUCTIONS:

- * Answer all the questions:
- * Questions 1 to 8 carry one mark each. Answer them in one word or a sentence.
- * Questions 9 to 18 carry 2 marks each. Answer them in 20 to 30 words.
- * Questions 19 to 27 carry 3 marks each. Answer them in 40 to 50 words.
- * Questions 28 to 30 carry 5 marks each. Answer them in 70 words.
- * There is no overall choice. However there is internal choice in one question each of two mark and three marks questions. All 5 marks questions have internal choice.
- * Calculator or any other electronic items are not allowed. However logarithm book may be used for calculations.

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- Q.1** Draw the structural formula of 1-phenylpropan-1-one molecule.
- Q.2** Which point defect in crystals of a solid decreases the density of the solid?
- Q.3** Define ‘activation energy’.
- Q.4** P_4O_{10} is a well known dehydrating agent, but cannot be used for drying ammonia. Why?
- Q.5** p-Dichlorobenzene has a higher melting point than ortho and meta isomer. Why?
- Q.6** Give an example of ionization isomerism.
- Q.7** Give the IUPAC name of $H_2N - CH_2 - CH_2 - CH_2 - CH_3$.
- Q.8** A solution of KOH hydrolyses $CH_3CHClCH_2CH_3$ and $CH_3CH_2CH_2Cl$. Which one of these is more easily hydrolysed?
- Q.9** Draw the structures of white phosphorus and red phosphorus. Which one of these two types of phosphorus is more reactive and why?
- Q.10** The rate constant for a reaction of zero order in A is $0.0030 \text{ mol L}^{-1} \text{ s}^{-1}$. How long will it take for the initial concentration of A to fall from 0.10 M to 0.075 M?
- Q.11** A reaction is of first order in reactant A and of second order in reactant B. How is the rate of this reaction affected when (i) the concentration of B alone is increased to three times (ii) the concentrations of A as well as B are doubled?
- Q.12** Non-ideal solutions exhibit either positive or negative deviations from Raoult’s law. What are these deviations and why are they caused? Explain with one example for each type.
- Q.13** Write the chemical equations involved in the following
- (a) $FeCr_2O_4 + Na_2CO_3 + O_2 \longrightarrow$
 - (b) $CrO_4^{2-} + H^+ \longrightarrow$
- Q.14** How are the following conversions carried out?
- (i) Benzyl chloride to benzyl alcohol,
 - (ii) Methyl magnesium bromide to 2-methylpropan-2-ol
- Q.15** Illustrate the following reactions giving a chemical equation for each:
- (i) Kolbe’s reaction,
 - (ii) Williamson synthesis.
- Q.16** Explain the following terms:

- (i) Invert sugar
(ii) Polypeptides
- Q.17** Name the following coordination compounds according to IUPAC system of nomenclature:
(i) $[\text{Co}(\text{NH}_3)_4(\text{H}_2\text{O})\text{Cl}]\text{Cl}_2$
(ii) $[\text{CrCl}_2(\text{en})_2]\text{Cl}$, (en = ethane - 1, 2 - diamine)
- Q.18** State clearly what are known as nucleosides and nucleotides.
- Q.19** The density of copper metal is 8.95 g cm^{-3} . If the radius of copper atom is 127.8 pm, is the copper unit cell a simple cubic, a body-centred cubic or a face centred cubic structure? (Given: At. Mass of Cu = 63.54 g mol^{-1} and $N_A = 6.02 \times 10^{23} \text{ mol}^{-1}$).
- Q.20** How are the following colloids different from each other in respect of their dispersion medium and dispersed phase? Give one example of each. (i) Aerosol (ii) Emulsion (iii) Hydrosol
- Q.21** A solution prepared by dissolving 1.25 g of oil of winter green (methyl salicylate) in 99.0 g of benzene has a boiling point of 80.31°C . Determine the molar mass of this compound. (B.P. of pure benzene = 80.10°C and K_b for benzene = $2.53^\circ\text{C kg mol}^{-1}$)
- Q.22** Describe how the following changes are brought about:
(i) Pig iron into steel
(ii) Zinc oxide into metallic zinc
(iii) Impure titanium into pure titanium.
- Q.23** (i) State one use each of DDT and iodoform.
(ii) Which compound in the following couples will react faster in $\text{S}_{\text{N}}2$ displacement and why?
(a) 1-Bromopentane or 2-bromopentane
(b) 1-bromo-2-methylbutane or 2-bromo-2-methylbutane.
- Q.24** How would you account for the following?
(i) The atomic radii of the metals of the third (5d) series of transition elements are virtually the same as those of the corresponding members of the second (4d) series.
(ii) The E° Value for the $\text{Mn}^{3+}/\text{Mn}^{2+}$ couple is much more positive than that for $\text{Cr}^{3+}/\text{Cr}^{2+}$ couple or $\text{Fe}^{3+}/\text{Fe}^{2+}$ couple.
(iii) The highest oxidation state of a metal is exhibited in its oxide or fluoride.
- Q.25** In the following cases rearrange the compounds as directed:
(i) In an increasing order of basic strength: $\text{C}_6\text{H}_5\text{NH}_2$, $\text{C}_6\text{H}_5\text{N}(\text{CH}_3)_2$, $(\text{C}_2\text{H}_5)_2\text{NH}$ and CH_3NH_2
(ii) In a decreasing order of basic strength: Aniline, p-nitroaniline and p-toluidine
(iii) In an increasing order of $\text{p}K_b$ values: $\text{C}_2\text{H}_5\text{NH}_2$, $\text{C}_6\text{H}_5\text{NHCH}_3$, $(\text{C}_2\text{H}_5)_2\text{NH}$ and $\text{C}_6\text{H}_5\text{NH}_2$
- Q.26** Differentiate between thermoplastic and thermosetting polymers. Give one example of each.
- Q.27** Explain the following terms with one suitable example in each case.
(i) Cationic detergents
(ii) Enzymes
(iii) Antifertility drugs
- Q.28** (a) Give chemical tests to distinguish between the following pairs of compounds:
(i) Ethanal and Propanal
(ii) Phenol and Benzoic acid
(b) How will you bring about the following conversions?
(i) Benzoic acid to benzaldehyde

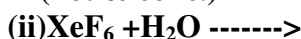
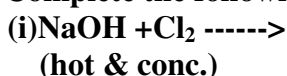
- (ii) Ethanal to but-2-enal
 (iii) Propanone to propene. Give complete reaction in each case.

- Q.29** (a) Write the anode & cathode reactions & overall reaction occurring in a lead storage battery.
 (b) A copper-silver cell is set up. The copper ion concentration is 0.10 M. The concentration of silver ion is not known. The cell potential when measured was 0.422 V. Determine the concentration of silver ions in the cell.

$$E_{\text{Ag}^+/\text{Ag}}^{\circ} = +0.80\text{V}, E_{\text{Cu}^{2+}/\text{Cu}}^{\circ} = +0.34\text{V}$$

(Given)

- Q.30** (a) Complete the following chemical equations:



- (b) How would you account for the following?

- (i) ClF_3 molecule has a T-shaped structure and not a trigonal planar one.
 (ii) Interhalogen compounds are more reactive than halogens.
 (iii) Oxygen molecule has the formula O_2 whilst sulphur molecule is S_8 . Why?.



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