SET–1

Roll No. | | | | | | | |

CBSE 2019 Sample Question Paper

CHEMISTRY

Time allowed: 3 hours ***Maximum marks: 70***

General Instructions:

(i) *All question are compulsory.*
(ii) *This question paper contains 30 questions.*
(iii) *Question number **1** to **10** in Section A very short-answer type questions carrying **1** mark each.*
(iv) *Questions number **11** to **16** in Section B short-answer type questions carrying **2** marks each.*
(v) *Questions number **17** to **27** in Section C are long-answer type questions carrying **4** marks each.*
(vi) *Questions number **28** to **30** in Section D are Descriptive type questions carrying **6** marks each.*

Section A

1. Define activation energy.

2. What is meant by chemisorptions ?

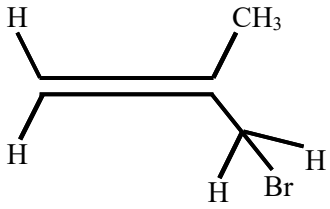
3. Complete the following equation. $Cu + HNO_3(dilute) \rightarrow$

4. Why is CO a stronger ligand than Cl ?

5. How is that alcohol and water are miscible in proportions ?

6. Name the purines present in DNA.

7. Write the IUPAC name of the following.



8. Give sample tests to distinguish between the following pair of compounds : Pentan-2-one and pentan-3-one

9. Calculate the packing efficiency of a metal crystal for a simple cubic lattice.

10. Explain Paramagnetism with example.

Section B

11. Explain with examples the term weak and strong electrolytes.

12. What are pseudo first order reactions ? Give one example of such reaction.

13. Explain the terms.
    (i) Elementary step in a reaction.
    (ii) Rate determining step of a reaction.

14. Draw the structure of
    (i) hypochlorous acid
    (ii) chlorous acid

15. Explain the following observations
    (i) Oxygen is gas but sulphur is a solid.
    (ii) The halogen are coloured.

16. Describe the shape and magnetic behaviour of the following complexes.
    (i) $[Co\ (NH_3)_6]^{3+}$
    (ii) $[Ni\ (CN)_4]^{2-}$

Section C

17. How will you convert
    (i) nitrobenzene to aniline ?
    (ii) aniline to iodobenzene ?

18. Write equation for
    (i) Sandmeyer's reaction
    (ii) Coupling reaction

19. A solution of $CuSO_4$ is electrolysed for 16 min with a current of 1.5 A. What is the mass of copper deposited at the cathode ?

20. Differentiate among a homogeneous solution, a suspension and a colloidal solution. Give suitable example of each.

21. Describe how the following changes are brought about ?
    (i) Pig iron into steel
    (ii) Zinc oxide to metallic zinc
    (iii) Impure titanium into pure titanium

22.
    (i) What prompted Bartlett to the discovery of noble gas compounds ?
    (ii) State two important uses of noble gases.

23.
    (i) Write the mechanism of the following reaction.

$$n\text{-BuBr} + CN \xrightarrow{EtOH,\ H_2O} n\text{-BuCN}$$

    (ii) Why is the dipole moment of chlorobenzene lower than that of cyclohexyl chloride ?

24. How would you obtain the following ?
    (i) Benzoquinone from phenol
    (ii) 3°-alcohol from methyl magnesium bromide
    (iii) Propan-1-ol from propene

25. Define the following as related to proteins.
    (i) Peptides linkage
    (ii) Primary structure
    (iii) Denaturation

26. Write chemical equation for the synthesis of
    (i) Nylon-6
    (ii) Nylon-6, 6
    (iii) Polythene

27. There is growing interest in the use of chelate therapy is medicinal chemistry. An example is the treatment of problems caused by the presence of metals in toxic proportions in plant/animal systems. Detection of cations through coloured complex formation is done in qualitative analysis. Read the above passage and answer the following questions.
    (i) Name the chelating agents that can remove copper, iron and lead from water.
    (ii) Name the compound that inhibits the growth of tumours.
    (iii) Recent studies show that *cis*-platin can cause serious effects; including severe kidney damage. What is the alternative medicine ?
    (iv) What values do you get form this passage ?

Section D

28.
    (i) Calculate the molarity and molality of a 15% solution (by weight) of sulphuric acid of density 1.020 g cm^{-3}.
    (Atomic masses of H = 1, 0 = 16, S = 32 u)
    (ii) Explain why a solution of chloroform and acetone shows negative deviation from Raoult's law ?

29.
    (i) Complete the following chemical reaction equations.
    - $Fe^{2+}(aq) + MnO^{-}_{4}(aq) + H^{+}(aq) \rightarrow$
    - $Cr_2O_7^{2-}(aq) + I^{-}(aq) + H^{+}(aq) \rightarrow$

    (ii) Explain the following observations.
    - Transition elements are known to form many interstitial compounds.
    - With the same d^4, *d*-orbital configuration Cr^{2+} ion is reducing while Mn^{3+} ion is oxidising.
    - Cu^{+} ion is unstable in aqueous solutions.

30.
    (i) How will you prepare the following compounds starting with benzene ?
    - Benzaldehyde
    - Acetophenone

    (ii) How will you bring about the following conversions ?
    - Propanone to propene
    - Ethanol to 3-hydroxy butanal
    - Benzaldehyde to benzophenone