

General Instructions-

The question paper is divided into four section.

- 1) Section A - Q. No 1 contains Ten multiple choice type of questions, carrying one mark each. Q. No 2 contains Eight short answer type of questions carrying one mark each.
- 2) Section B - Q. No 3 to Q. No 14 are Twelve short answer type (I) of questions carrying two marks each. (Attempt any Eight)
- 3) Section C - Q. No 15 to Q. No 26 are Twelve short answer type (II) of questions carrying Three marks each. (Attempt any Eight)
- 4) Section D - Q. No 27 to Q. No 31 are Five long answer type of questions carrying four marks each. (Attempt any Three)
- 5) Use of log table is allowed. Use of calculator is not allowed.
- 6) Figures to the right indicate full marks.
- 7) For each multiple choice type of questions, it is mandatory to write the correct answer along with its alphabet. eg. a)..../ b)..../ c)..../ d)....
No marks (s) shall be given, It only the correct answer or the alphabet of the correct answer is written

Only the first attempt will be considered for evaluation.

- 8) Physical constant : Avogadro's $N = 14$, $O = 16$, $S = 32$, $Fe = 26$,
 $V = 23$, $Sb = 51$, $Cl = 8.314 \text{ Jk}^{-1} \text{ mol}^{-1}$.

Section - A

18

1. **Select and write the correct answer for the following multiple choice type of questions :**

10

- 1) Phenol $\xrightarrow[\Delta]{A}$ Benzene. In this reaction the reagent 'A' is
a) Na $\xrightarrow[\Delta]{A}$ b) Ca c) Zn d) K
- 2) Oxidation of sulfur dioxide to sulfur trioxide with dioxygen (O_2) in the presence of nitric oxide in gaseous phase act as
a) inhibitor b) homogeneous
c) heterogeneous catalyst d) enzyme catalyst
- 3) Which of the following species will have the largest size
Mg, Mg^{2+} , Fe, Fe^{3+} ?
a) Fe b) Mg c) Mg^{2+} d) Fe^{3+}
- 4) A solution is prepared by adding 2 gm of substance A to 18 g of water, the mass percent of solute is
a) 0.1 w/w b) 0.01 w/w c) 1.0 w/w d) 10.00 w/w

5) Which of the following electrolytes is used to maintain electrical neutrality in the Daniel cell ?

- a) KCl b) KOH c) NH_4Cl ~~d) NaCl~~

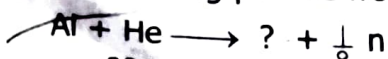
6) Impure common salt can be purified by

- a) distillation ~~b) crystallization~~ c) extraction d) sublimation

7) The equilibrium, $\text{H}_2\text{O}(\text{l}) \rightleftharpoons \text{H}^+(\text{aq}) + \text{OH}^-(\text{aq})$ is

- a) Static ~~b) Physical~~ ~~c) dynamic~~ d) mechanical

8) The missing particle from the nuclear reaction is



- ~~a) ${}_{15}^{30}\text{P}$~~ b) ${}_{16}^{32}\text{S}$ c) ${}_{10}^{14}\text{Ne}$ d) ${}_{14}^{14}\text{Si}$

9) The correct statement regarding electrophile is

- ~~a) Electrophile is a negatively charged species and can form a bond by accepting a pair of electrons from a nucleophile.~~
 b) Electrophile is a negatively charged species and can form a bond by accepting a pair of electrons from another electrophile.
 c) Electrophiles are generally neutral species and can form a bond by accepting a pair of electrons from a nucleophile.
 d) Electrophile can be either neutral or positively charged species and can form a bond by accepting a pair of electrons from a nucleophile.

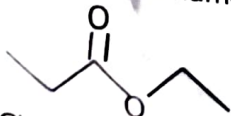
10) Which of the following is used as a weak antiseptic for eyes ?

- a) Tincture of iodine b) Dilute solution of dettol
~~c) Iodoform~~ d) Dilute aqueous solution of boric acid.

2. Answer the following questions.

8

- 1) What are cleaning agents ?
- 2) State Avogadro's law
- 3) Write the formula to calculate bond order of molecule.
- 4) What are alkali metals ?
- 5) Define - surface tension.
- 6) Write IUPAC name of following.



7) Give name of molecule having banana bond.

8) Define - Wavelength (λ)

Section - B

16

Attempt any Eight of the following.

3. Draw neat, labelled diagram of Daniel cell.

22. A Compound with molar mass 159 was found to contain 39.62% copper and 20.13% sulphur. Suggest molecular formula for the compound (Atomic masses : Cu = 63, S = 32 and O = 16.)
23. Explain homolytic cleavage and heterolytic cleavage.
Define - Isoelectronic species.
24. Calculate the volume of one mole of gas at exactly 20 °C at a pressure of 101.35 KPa. Write SI unit of viscosity coefficient.
25. Write the type of hybridization and geometry of NH₃ molecule.
Indicate the number of unpaired electrons in
a) Nickel (Z = 28) b) Chromium (Z = 24) 1s² 2s² 2p⁶ 3s² 3p⁶ 4s² 3d⁴
26. State and explain Boyle's law. What is the SI unit of Rate of diffusion ?

Section - D**12****Attempt Any Three of the following.**

27. a) Calculate the number of atoms in 42 g of nitrogen (N) 2
b) What are alkynes ? Write chemical equation for combustion of butane. 2
28. a) How will you prepare ethane from 2
i) ethyl bromide ii) ethyl magnesium bromide
b) Define - Atomic mass unit (a. m. u.) 2
c) Calculate molecular mass of ethyl alcohol.
29. a) Draw Lewis dot structure of i) CF₃Cl ii) C₂H₆ 2
b) Derive the expression of equilibrium constant, K_c for the reaction. 2
$$A + B \rightleftharpoons C + D$$
30. a) Distinguish between sigma (σ) and Pi (π) bond. 2
b) Calculate unit of equilibrium constant for the following equilibrium reaction. 2
$$H_{2(g)} + I_{2(g)} \rightleftharpoons 2HI_{(g)}$$
31. a) State the importance of sodium and potassium in biological system. 2
b) Write any two uses of H₂O₂. 1
c) Write molecular formula and structure of orthophosphoric acid. 1