



ANGEL'S PUBLIC SCHOOL

HALF YEARLY EXAMINATION

(SAMPLE PAPER)

SESSION 2026 – 27
SUBJECT : CHEMISTRY

TIME : 03 HRS

GRADE – XII

M.M:70

General Instruction

ATTEMPT ALL QUESTIONS

SECTION – A (Q NO. 1 TO 15) CARRIES 1 MARKS EACH

SECTION – B (Q NO. 16 TO 23) CARRIES 2 MARKS EACH

SECTION – C (Q NO. 24 TO 31) CARRIES 3 MARKS EACH

SECTION – D (Q NO. 32 TO 34) CARRIES 5 MARKS EACH

USE OF CALCULATOR IS NOT ALLOWED

SECTION – A

(20x1=20)

- The vapour pressure of water depends upon:
(1) Volume of container (2) Temperature (3) Amount of liquid (4) All the above
- Osmotic pressure is measured by:
(1) Ostwald's method (2) Berkeley and Hartley method (3) Pfeffer's method (4) Beckmann's method
- Blood cells retain their shape in solution which are:
(1) Isotonic to blood (2) Hypotonic to blood (3) Hypertonic to blood (4) equimolar to blood
- When injected in blood which colligative properties of glucose should resembles with blood:
(1) molarity (2) molality (3) osmotic pressure (4) concentration
- The normality of 1M H_3PO_4 is:
(1) 1N (2) 3N (3) 0.33N (4) 0.5N
- The freezing point of 1% solution of sodium carbonate in water will be:
(1) 0°C (2) Below 0°C (3) 1°C (4) 3°C
- The coulombs of electricity required for reduction of 1mol of MnO_4^- to Mn^{2+} are:
[A] 96500C [B] $1.93 \times 10^5\text{C}$ [C] $4.83 \times 10^5\text{C}$ [D] $9.65 \times 10^6\text{C}$
- How long 2.5A of current is passed to supply 54000C of charge?
[A] 1 hr [B] 2.5hr [C] 6hr [D] 9hr
- The charge required for the reduction of 1 mole of $\text{Cr}_2\text{O}_7^{2-}$ to Cr^{3+} is:
[A] 96500C [B] $1.93 \times 10^5\text{C}$ [C] $5.79 \times 10^5\text{C}$ [D] $2.895 \times 10^5\text{C}$
- In the electrolysis of acidulated water. It is desired to obtain 1.12cc of hydrogen per second under S.T.P conditions. The current to be passed is
[A] 9.65A [B] 19.3A [C] 0.965A [D] 1.93A
- 75% of a first order reaction was completed in 32 minutes. 50% of the reaction was complete in :

- [a] 4 min [b] 8 min [c] 16min [d] 24 min
12. The emf of the cell $\text{Cr}/\text{Cr}^{3+} (1\text{M}) \parallel \text{Cd}^{2+}(0.1\text{M})/\text{Cd}$ is:
(E^0 for Cr and Cd electrode are -0.47V and -0.40V)
[A] 0.34V [B] 1.14V [C] -1.14V [D] 0.66V
13. The sum of mole fraction of A, B, and C in a solution containing 0.2 mol of each of A, B and C is
(a) 0.1 (b) 1.00 (c) 0.3 (d) 0.6
14. The normality of 98% H_2SO_4 ($d = 1.8\text{g/ml}$) is:
(a) 18N (b) 36N (c) 9N (d) 6N
15. The mole fraction of solute in one molal aqueous solution is:
(a) 0.009 (b) 0.018 (c) 0.027 (d) 0.036

SECTION – B

(2x7=14)

16. Explain Lanthanoid contraction.
17. When temperature changes from 300K to 301K, the rate constant of the reaction increases by 7%. Calculate activation energy.
18. Which oxide of sulphur acts as both an oxidising and a reducing agent and why?
19. Define the ebullioscopic constant and electrophoresis.
20. What are chelation and ambident ligand?
21. How many coulombs are required to deposit 100 g of aluminium?
22. Explain cryoscopic constant.
23. Calculate the maximum possible workdone and E_{cell} for the cell $\text{Al} / \text{Al}^{3+} (0.01\text{M}) \parallel \text{Fe}^{2+} (0.02\text{M}) / \text{Fe}$. Given that E^0 for aluminium and iron are -1.66V and -0.44V

SECTION – C

(3x7=21)

24. In the following reaction at 300 K, $2\text{A} + \text{B} \rightarrow \text{C} + \text{D}$:

Exp no.	[A] mol/l	[B] mol/l	Rate of formation of D (mol/l)
1	0.10	0.10	1.3×10^{-6}
2	0.20	0.10	5.2×10^{-6}
3	0.20	0.30	1.56×10^{-5}

Calculate [1] the order [2] the rate law [3] rate constant

25. The rate constant of first order reaction is 60 s^{-1} . how much time will it take to reduce the concentration of the reactant to $1/10^{\text{th}}$ of its initial value.

26. A first order rate of a reaction triples when temperature changes from 50°C to 100°C. Calculate activation energy?
27. Give some examples of lanthanoid which shows +4 and +2 stable electronic configuration?
28. The rate constant of first order reaction for the decomposition of ethyl iodide by the reaction $\text{C}_2\text{H}_5\text{I}(\text{g}) \rightarrow \text{C}_2\text{H}_4(\text{g}) + \text{HI}(\text{g})$ at 600K is $1.60 \times 10^{-5} \text{s}^{-1}$. Its energy of activation is 209 kJ/mol. Calculate the rate constant of the reaction at 700K.
29. A first order reaction is 15% completed in 20 minutes. How long will it take to complete 40 %?
30. Explain an Ideal solution graphically.
31. When temperature changes from 300K to 301K the rate constant of the reaction increases by 7%. Calculate activation energy?

SECTION – D

(3x5=15)

31. Give reason why:
- [1] Transition elements form coordination complex
 - [2] Mostly paramagnetic in nature
 - [3] Calculate magnetic moment of Sc^{3+} , Fe^{3+} , Zn^{2+} , Ni^{2+} , Cu^{2+} and predict which of them form coloured compounds
 - [4] Explain the preparation of potassium dichromate from chromite ore.
34. An aqueous solution containing 1.248g of barium chloride ($M=208.34$) in 100 g of water boils at 100.0832°C. Calculate degree of dissociation of barium chloride. $K_b = 0.52 \text{ K/m}$
33. A solution of sucrose (mass 342) has been prepared by dissolving 68.4g of sucrose in 1 kg of water. Calculate the following:
- [1] Vapour pressure of solution at 298 K
 - [2] Osmotic pressure of solution at 298 K
 - [3] Freezing point of solution. (V.P of water 0.024 atm, K_f for water = 1.86 K Kg/mol)