



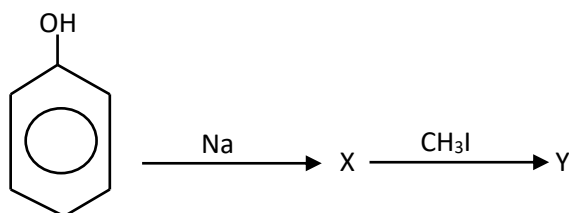
Note Mandir

Practice Question/Test Series-I

Class-12

Subject- Chemistry(3021)

1. Mention any two general methods of preparation of haloalkanes. Why the chloroform stored in dark brown bottle? What happen when chloroform treated with,
(i) Silver powder
(ii) Conc. HNO_3
2. What are unsymmetrical ethers? Write down the possible unsymmetrical ethers of $\text{C}_4\text{H}_{10}\text{O}$ and write their IUPAC name. How Williamson's synthesis is used to prepare unsymmetrical ether and write the example for the preparation of any one above unsymmetrical ether.
3. How would you distinguish 1° , 2° & 3° alcohol by using Victor Meyer's method? Write a chemical reaction for the preparation of primary alcohol by oxo-process. Convert propan-1-ol into propan-2-ol.
4. An organic compound 'A' reacts with HCN to give compound 'B'. On hydrolysis of 'B' in acidic medium gives 'C'. Compound 'A' also produces propane when treated with Zinc-amalgam and HCL . Identify A,B & C with reaction and give their name. What product would you expect when 'A' is treated with trichloro methane in alkaline medium.
5. Name the compound (X) and (Y) in the following reaction. Why is phenol more acidic then aliphatic alcohol?



6. An aliphatic compound 'A' reacts with SOCl_2 to give 'B'. The compound 'B' is heated with ammonia to produce 'C'. The compound 'C' is further heated with Br_2/KOH to yield 'D'. The compound gives 'E' when treated with NaNO_2/HCL at low temperature. The compound 'E' is primary alcohol which gives positive iodoform test. Identify A,B,C,D & E. Write reaction involved.

7. Define primary standard solution. 1g of divalent metal was dissolves in 25 ml of 2N H_2SO_4 ($f=1.01$). The excess acid required 1.51 ml of 1N NaOH ($f=0.8$) for complete neutralization. Find atomic weight of the metal.

8. Define activation energy. What are the factor that affect the rate of reaction. For a hypothetical reaction $2\text{NO} + \text{Cl}_2 \rightarrow 2\text{NOCl}$

Exp	[NO] mol/L	[Cl ₂] mol/L	Initial rate of [NOCl] mol/L sec
1	0.1	0.1	4.0×10^{-1}
2	0.2	0.2	1.6×10^{-4}
	0.5	0.1	1.0×10^{-2}
	0.5	0.5	1.0×10^{-2}

- Calculate the rate constant [K].
- Write the expression for rate law.

9. Write the chemistry of Calomel. Convert HgCl_2 into Hg_2Cl_2 and vice-versa.

10. Give an example of following reaction.

- Reimer Tiemann's reaction
- Coupling reaction
- Cannizzaro's reaction
- Wurtz reaction
- Aldol condensation

11.

- What is radioactivity?
- Write the structure of Aspirin and Paracetamol.
- what are the composition of Portland cement?
- Draw the flowsheet diagram of paper production.

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Practice Question/Test Series-I

Class-12

Subject- Physics (1021)

1.
 - a. Define radius of gyration.
 - b. State principle of conservation of angular momentum.
 - c. A electric fan is turned off, and its angular velocity decreases uniformly from 500 rev/min to 200 rev/min in 4 seconds. Find the angular acceleration and the number of revolutions made by the motor in the 4 sec interval.
2.
 - a. Define Second's pendulum.
 - b. Derive the expression for the time of vertical mass spring system.
 - c. The velocity of a particle executing simple harmonic motion is 16 cms^{-1} at a distance of 8cm from the mean position and 8 cms^{-1} at a distance of 12 cm from the mean position. Calculate the amplitude of the solution.
3.
 - a. Define adiabatic process.
 - b. Apply the first law of thermodynamics to relate the two specific heat capacities of a gas i.e. $C_p - C_v = R$.
 - c. Can work done by the system without changing its volume.?
4.
 - a. What are stationary waves?
 - b. How do transverse waves differs from longitudinal waves?
 - c. A wave has the equation (x in meters and t in second)
$$Y = 0.02 \sin (30t - 4x)$$
Find its frequency, speed and wavelength.
5.
 - a. Why are sounds heard better on a wet day than on a dry day?
 - b. Write Newton's formula for the velocity of sound in air and express how it was corrected by Laplace.

- c. A sound of frequency 550 Hz emits waves of frequency 60 cm in air at 20°C. What would be the wavelength of sound from the source in air at 0°C?
- 6.
- Define Doppler's effect.
 - Why is the voice of a woman more intelligible than that of a man?
 - A truck approaching a cliff at 20 m/s. The driver sounds a horn of frequency 800 Hz. What will be the frequency of echo as heard by the driver? (velocity of sound in air is 330 m/s)
- 7.
- What is the principle of potentiometer?
 - How would you convert galvanometer into voltmeter.
 - A potentiometer is 10 m long. It has resistance of 20Ω . It is connected in series with a battery of 3V and resistance of 10Ω . What is the potential gradient along with wire?
- 8.
- What is temperature of inversion and what factors does it depend?
 - How is Seebeck's effect differs from Peltier's effect?
- 9.
- State and explain Biot-Savart law.
 - A solenoid tends to contract when a current passes through it. Why?
 - Two long parallel transmission lines, 40.0 cm apart carry 25.0A currents. Find location where the net magnetic field of these two wires is zero if these currents are in same direction.
- 10.
- What is the use of atomizer and X-ray in the Millikan's oil drop experiment?
 - Can we use water instead of clock oil in Millikan's oil drop experiment?
 - Determine the electric field supplied when the electric force applied between the two horizontal plates just balances an oil drop with 4 electrons attached to it. (Mass of oil drop is 1.3×10^{-4} kg)
- 11.
- Define threshold frequency.
 - Write the application of photoelectric effect.
 - A clean nickel surface of work function 5.1 eV is exposed to light of wavelength 235nm. What is the maximum speed of the photoelectric emitted from its surface?

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Note Mandir

Practice Question/Test Series-I

Class-12

Subject- Mathematics (0081)

1.

- How many number of three different digits less than 500 can be formed from the integers 1,2,3,4,5,6,7?
- The Nepali National Cricket team consisting 16 players includes 2 wicketkeepers and 6 bowlers. In how many ways can a cricket team of eleven players containing 1 wicketkeeper and at least 5 bowlers be selected.

2.

- Define binomial expansion.
- Prove that:

$$1 + \frac{1+2}{2!} + \frac{1+2+3}{3!} + \frac{1+2+3+4}{4!} + \dots + \infty = + \frac{3e}{2}$$

3.

- State De-Moivre's theorem hence determines the cube root of unity.
- Show that:

$$(1 - \omega + \omega^2)^4 (1 + \omega - \omega^2) = 256$$

4.

- Sum to n terms of series:

$$1 + \frac{2}{2} + \frac{3}{2^2} + \frac{4}{2^3} + \dots$$

- Prove by the method of induction " $n^3 + 2n$ is divisible by 3"

5.

- Using the simplex method, minimize $W=3x + 2y$ subject to $2x + y \geq 4$, $x - 2y \geq 4$, $x, y \geq 0$.
- Solve by Gauss Seidel method, $3x + 4y + 8z = 7$, $x + 20y + z = -18$, $25x + y - 5z = 19$.

6. The regression equations related to age (x) and blood pressure (y) are given as below.

$$2.22x - y + 81.1175 = 0 \text{ and } x - 1.623y + 105.695 = 0.$$

- Find the regression coefficient.
- Find the correlation coefficient.

c. Find the mean of x and mean of y.

7. Solve by the row-equivalent method:

$$3x + 4y + 2z = 18, 4x + 2y + 3z = 18, 2x + 3y + 4z = 18$$

8.

a. Define projection of $\vec{b}$ on $\vec{a}$.

b. Prove by vector method:

$$\cos(A+B) = \cos A \cos B - \sin A \sin B$$

9.

a. Evaluate $\lim_{x \rightarrow 0} \frac{1 - \cos 4x}{x^2}$

b. What is the derivatives of:

i. $\frac{d}{dx} (\operatorname{Cosec} hx)$

ii. $\frac{d}{dx} (\cos^{-1} hx)$

c. Evaluate: $\int \frac{dx}{1 - \sin x + \cos x}$

10.

a. State Sin law. Prove that $\tan \frac{1}{2}(B - C) = \frac{b - c}{b + c} \cdot \cot \frac{A}{2}$

b. If $C = 30^\circ$, $B = 45^\circ$ and $c = 6\sqrt{2}$. Solve the triangle.

11.

a. Show that the line $\frac{x}{a} + \frac{y}{b} = 1$. Will tangent to the circle $(x-a)^2 + (y-b)^2 = r^2$ if $\frac{1}{a^2} + \frac{1}{b^2} + \frac{1}{r^2}$

b. Find the equations of the tangents from the point $(-6, -9)$ to the parabola $y^2 = 24x$.

c. Find the eccentricity and length of latus rectum of the curve $\frac{x}{64^2} + \frac{y}{81^2} = 1$.

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