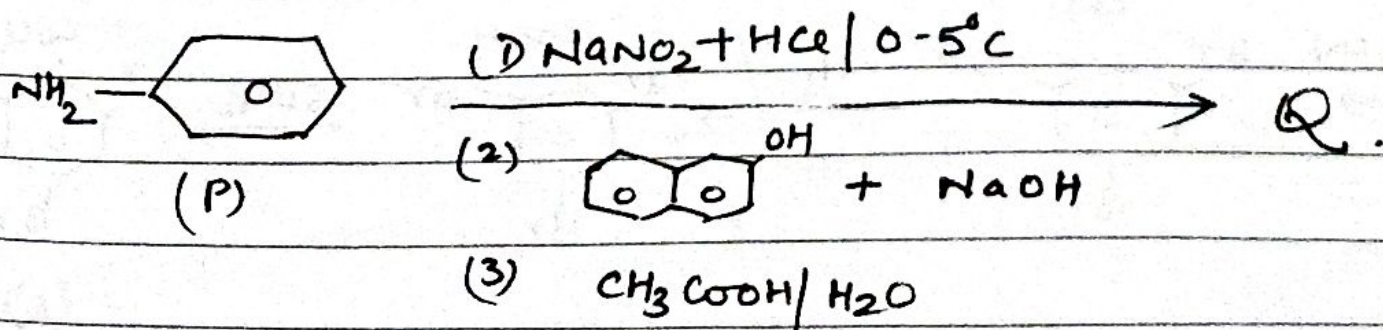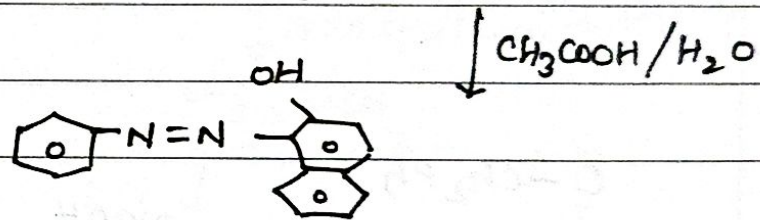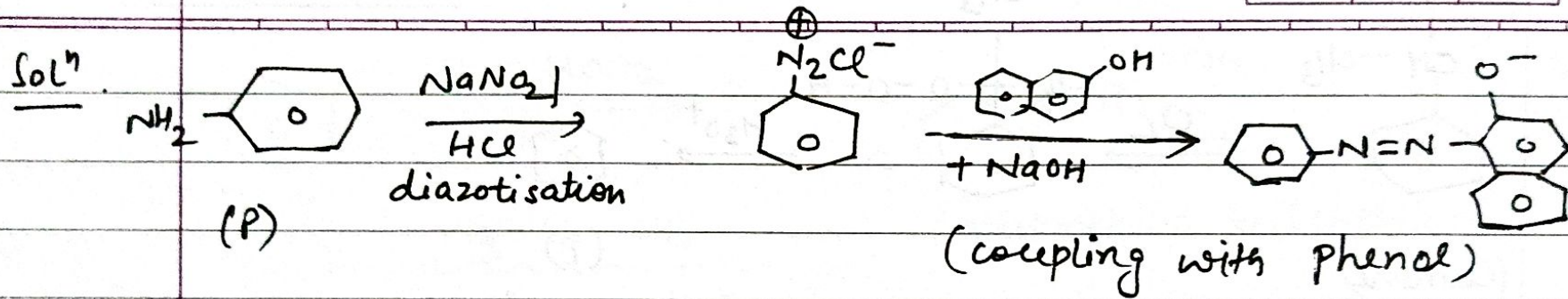* Consider the sequence from P to Q. Overall yield of Q from P is 75%. What is the amount of Q (grams) obtained from 9.3 ml of P? (use density of P = 1 g ml^{-1}

Molar mass of C = 12.0   H = 1.0   N = 14.0   O = 16.0 amu)

$$NH_2 - \bigcirc - O \xrightarrow[\substack{(2) \; \bigcirc\bigcirc^{OH} + NaOH \\ (3) \; CH_3COOH/H_2O}]{(1) \; NaNO_2 + HCl \, / \, 0-5°C} Q.$$

(P)

Sol^n.

(P) → NaNO₂ / HCl (diazotisation) → N_2Cl^- structure → (coupling with phenol) + NaOH → azo product with naphthol (O⁻)

$\downarrow CH_3COOH/H_2O$

azo product (Q) with OH

I mole of P gives I mole Q theoretically. But since yield is 75%; 1 mole P gives .75 mole Q.

Now, molar mass of $P = 93 \ g\,mol^{-1}$

$Q = 248 \ g\,mol^{-1}$.

So, $9.3 \ ml \ P \Rightarrow 9.3 \ g \ P \Rightarrow 0.1$ mole P

$\Rightarrow 0.075$ mole Q

Mass of $Q = 0.075 \times 248 = \boxed{18.60 g}$