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2 0 2 6
Session
Solutions

21ˢᵗ Jan. Shift–1

Memory Based Questions

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? In Carius method, 0.75 g of an organic compound gave 1.2 g of barium sulphate,
Find % of sulphur (molar mass 32 g mol^{-1}.)
Molar mass of barium sulphate is 233 mol^{-1}

(A) 16.48%

B) 4.55%

C) 21.97%

D) 10.30%

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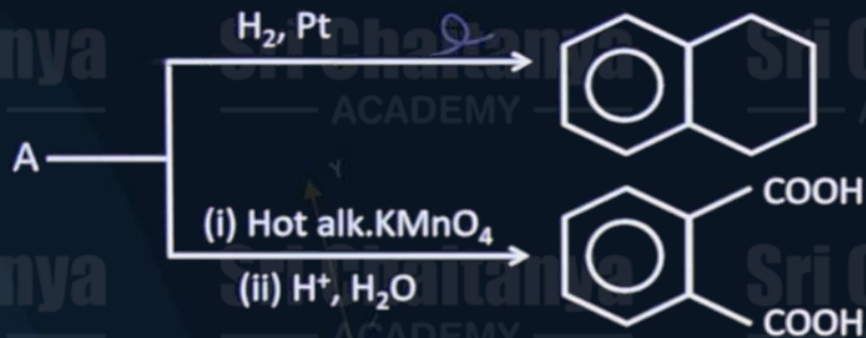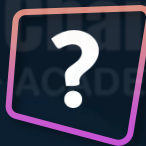**?** 14.0 g of calcium metal is allowed to react with excess HCl at 1.0 atm pressure & 273 K. Which of the following statement is incorrect ?
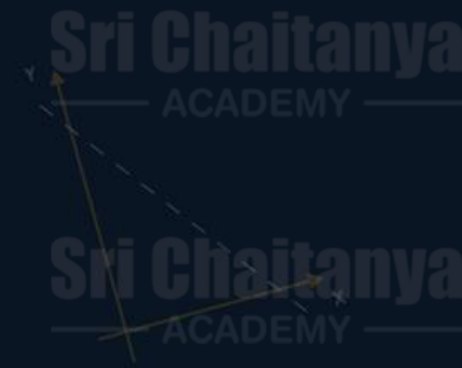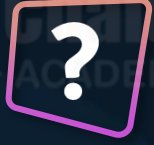(Molar Mass in g mol^{-1} $\mathrm{Ca} = 40, \mathrm{Cl} = 35.5$)

(a) 0.35 mol of H_2 gas is evolved.

(b) The limiting reagent is calcium metal.

(c) 33.3g of $CaCl_2$ is produced.

(d) 7.84 L of H_2 gas is evolved.

A

$\xrightarrow{\text{H}_2,\ \text{Pt}}$ [decalin structure]

$\xrightarrow[\text{(ii) H}^+,\ \text{H}_2\text{O}]{\text{(i) Hot alk.KMnO}_4}$ [benzene ring with two COOH groups — phthalic acid]

Which of the following is A :

1 [naphthalene structure]

2 [structure with one aromatic ring fused to cyclohexane]

3 [structure]

4 [structure]

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?

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? $\quad \cosec 10° - \sqrt{3}\sec 10° =$

a) 8

b) 6

c) 4

d) 2

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? The Hyperbola and ellipse $\frac{x^2}{36} + \frac{y^2}{16} = 1$ have same foci and eccentricity of Hyperbola is 5 then length of latus rectum of hyperbola is

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? $6\int_0^\pi |\sin 3x + \sin 2x + \sin x|\, dx =$

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? $x^2 + x + 1 = 0$, **value of** $\left(x + \frac{1}{x}\right)^4 + \left(x^2 + \frac{1}{x^2}\right)^4 + \left(x^3 + \frac{1}{x^3}\right)^4 + \cdots + \left(x^{25} + \frac{1}{x^{25}}\right)^4$ **is**
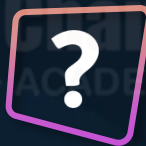
A) 175
B) 162
C) 145
D) 128

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? The number of relations, defined on the set $\{a, b, c, d\}$ which are both reflexive & symmetric is equal to

A) 16
B) 1024
C) 64
D) 256

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? **For some** $\alpha, \beta \in R$ **let** $A = \begin{bmatrix} \alpha & 2 \\ 1 & 2 \end{bmatrix}$ **&** $B = \begin{bmatrix} 1 & 1 \\ 1 & \beta \end{bmatrix}$ **be such that**

$A^2 - 4A + 2I = B^2 - 3B + I = 0$ **then** $\left(\det \left(\text{adj} \left(A^3 - B^3 \right) \right) \right)^2$ **is**

equals to