

<b>Section type :</b>	Online
<b>Mandatory or Optional :</b>	Mandatory
<b>Number of Questions :</b>	20
<b>Number of Questions to be attempted :</b>	20
<b>Section Marks :</b>	80
<b>Mark As Answered Required? :</b>	Yes
<b>Sub-Section Number :</b>	1
<b>Sub-Section Id :</b>	864351237
<b>Question Shuffling Allowed :</b>	Yes

**Question Number : 31 Question Id : 8643513541 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Amongst the following, the linear species is :

**Options :**

86435110621.  $\text{N}_3^-$

86435110622.  $\text{NO}_2$

86435110623.  $\text{O}_3$

86435110624.  $\text{Cl}_2\text{O}$

**Question Number : 32 Question Id : 8643513542 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

During which of the following processes, does entropy decrease ?

- (A) Freezing of water to ice at  $0^\circ\text{C}$
- (B) Freezing of water to ice at  $-10^\circ\text{C}$
- (C)  $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightarrow 2\text{NH}_3(\text{g})$
- (D) Adsorption of  $\text{CO}(\text{g})$  on lead surface.
- (E) Dissolution of  $\text{NaCl}$  in water

Choose the correct answer from the options given below :

**Options :**

86435110625. (A), (B), (C) and (D) only

86435110626. (A), (C) and (E) only

86435110627. (A) and (E) only

86435110628. (B) and (C) only

**Question Number : 33 Question Id : 8643513543 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1**

For the coagulation of a negative sol, the species below, that has the highest flocculating power is :

**Options :**

86435110629.  $Ba^{2+}$

86435110630.  $Na^{+}$

86435110631.  $PO_4^{3-}$

86435110632.  $SO_4^{2-}$

**Question Number : 34 Question Id : 8643513544 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1**

The set of elements that differ in mutual relationship from those of the other sets is :

**Options :**

86435110633. Be - Al

86435110634. B - Si

86435110635. Li - Na

86435110636. Li - Mg

**Question Number : 35 Question Id : 8643513545 Question Type : MCQ Option Sh Question Mandatory : No Correct Marks : 4 Wrong Marks : 1**

Match List - I with List - II :

List - I	List - II
(a) Haematite	(i) $\text{Al}_2\text{O}_3 \cdot x\text{H}_2\text{O}$
(b) Bauxite	(ii) $\text{Fe}_2\text{O}_3$
(c) Magnetite	(iii) $\text{CuCO}_3 \cdot \text{Cu}(\text{OH})_2$
(d) Malachite	(iv) $\text{Fe}_3\text{O}_4$

Choose the correct answer from the options given below :

**Options :**

86435110637. (a)-(i), (b)-(iii), (c)-(ii), (d)-(iv)

86435110638. (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)

86435110639. (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)

86435110640. (a)-(ii), (b)-(iii), (c)-(i), (d)-(iv)

**Question Number : 36 Question Id : 8643513546 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

The functional groups that are responsible for the ion-exchange property of cation and anion exchange resins, respectively, are :

**Options :**

86435110641.  $-\text{SO}_3\text{H}$  and  $-\text{NH}_2$

86435110642.  $-\text{NH}_2$  and  $-\text{COOH}$

86435110643.  $-\text{NH}_2$  and  $-\text{SO}_3\text{H}$

86435110644.  $-\text{SO}_3\text{H}$  and  $-\text{COOH}$

**Question Number : 37 Question Id : 8643513547 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

One of the by-products formed during the recovery of  $\text{NH}_3$  from Solvay ]

**Options :**

86435110645.  $\text{NH}_4\text{Cl}$

86435110646.  $\text{Ca}(\text{OH})_2$

86435110647.  $\text{CaCl}_2$

86435110648.  $\text{NaHCO}_3$

**Question Number : 38 Question Id : 8643513548 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

The set that represents the pair of neutral oxides of nitrogen is :

**Options :**

86435110649.  $\text{NO}$  and  $\text{N}_2\text{O}$

86435110650.  $\text{N}_2\text{O}$  and  $\text{NO}_2$

86435110651.  $\text{NO}$  and  $\text{NO}_2$

86435110652.  $\text{N}_2\text{O}$  and  $\text{N}_2\text{O}_3$

**Question Number : 39 Question Id : 8643513549 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

The common positive oxidation states for an element with atomic number 24, are :

**Options :**

86435110653. +1 to +6

86435110654. +2 to +6

86435110655. +1 and +3 to +6

86435110656. +1 and +3

**Question Number : 40 Question Id : 8643513550 Question Type : MCQ Option Sh**

**Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

**Match List - I with List - II :**

List - I	List - II
(a) $[\text{Co}(\text{NH}_3)_6][\text{Cr}(\text{CN})_6]$	(i) Linkage isomerism
(b) $[\text{Co}(\text{NH}_3)_3(\text{NO}_2)_3]$	(ii) Solvate isomerism
(c) $[\text{Cr}(\text{H}_2\text{O})_6]\text{Cl}_3$	(iii) Co-ordination isomerism
(d) $\text{cis-}[\text{CrCl}_2(\text{ox})_2]^{3-}$	(iv) Optical isomerism

Choose the correct answer from the options given below :

**Options :**

86435110657. (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)

86435110658. (a)-(ii), (b)-(i), (c)-(iii), (d)-(iv)

86435110659. (a)-(iii), (b)-(i), (c)-(ii), (d)-(iv)

86435110660. (a)-(iv), (b)-(ii), (c)-(iii), (d)-(i)

**Question Number : 41 Question Id : 8643513551 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Which of the following statement(s) is (are) incorrect reason for eutrophication ?

- (A) excess usage of fertilisers
- (B) excess usage of detergents
- (C) dense plant population in water bodies
- (D) lack of nutrients in water bodies that prevent plant growth

Choose the most appropriate answer from the options given below :

**Options :**

86435110661. (A) only

86435110662. (B) and (D) only

86435110663. (C) only

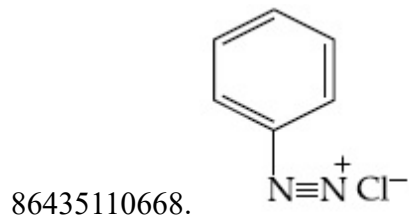
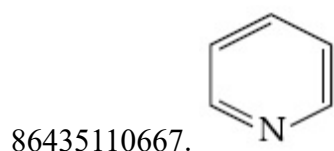
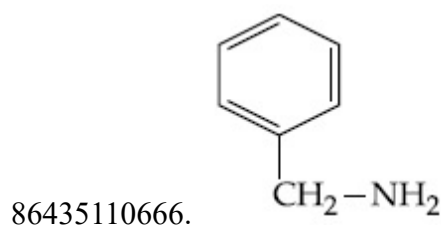
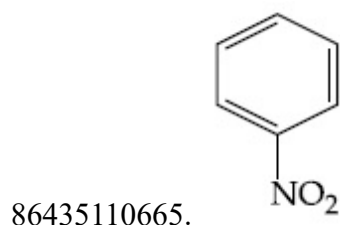
86435110664. (D) only

Question Number : 42 Question Id : 8643513552 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Nitrogen can be estimated by Kjeldahl's method for which of the following compound ?

Options :



Question Number : 43 Question Id : 8643513553 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The correct pair(s) of the ambident nucleophiles is (are) :

- (A) AgCN/KCN
- (B) RCOOAg/RCOOK
- (C) AgNO<sub>2</sub>/KNO<sub>2</sub>
- (D) AgI/KI

Options :

86435110669. (A) only

86435110670. (B) only

86435110671. (A) and (C) only

86435110672. (B) and (C) only

**Question Number : 44 Question Id : 8643513554 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Given below are two statements :

**Statement I :** 2-methylbutane on oxidation with  $\text{KMnO}_4$  gives 2-methylbutan-2-ol.

**Statement II :** n-alkanes can be easily oxidised to corresponding alcohols with  $\text{KMnO}_4$ .

Choose the correct option :

**Options :**

86435110673. Both statement I and statement II are correct

86435110674. Both statement I and statement II are incorrect

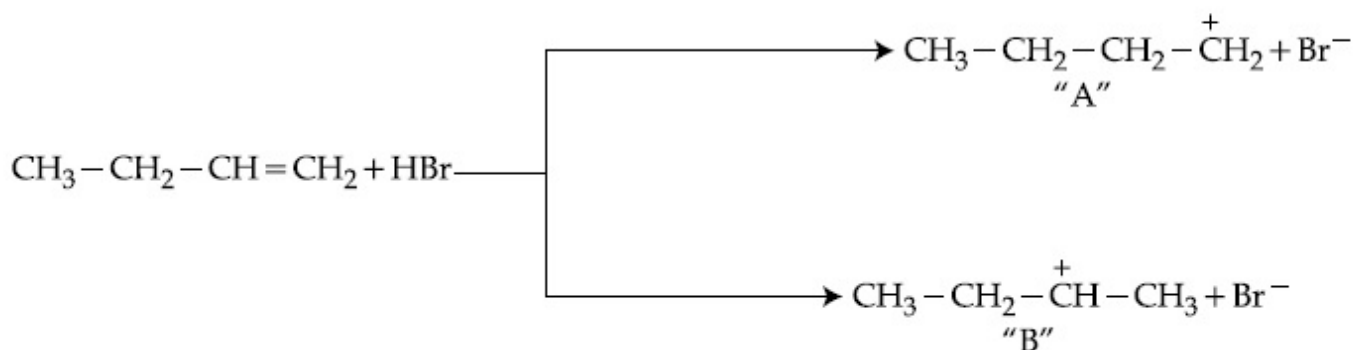
86435110675. Statement I is correct but statement II is incorrect

86435110676. Statement I is incorrect but statement II is correct

**Question Number : 45 Question Id : 8643513555 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Choose the correct statement regarding the formation of carbocations A and B given.



**Options :**

86435110677. Carbocation A is more stable and formed relatively at slow rate

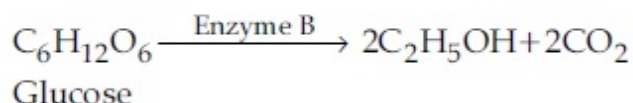
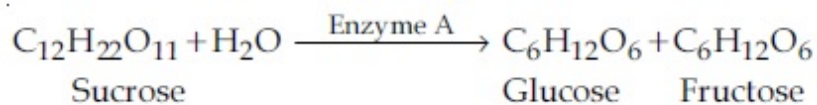
86435110678. Carbocation B is more stable and formed relatively at slow rate

86435110679. Carbocation A is more stable and formed relatively at faster rate

86435110680. Carbocation B is more stable and formed relatively at faster rate

**Question Number : 46 Question Id : 8643513556 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



In the above reactions, the enzyme A and enzyme B respectively are :

**Options :**

86435110681. Invertase and Zymase

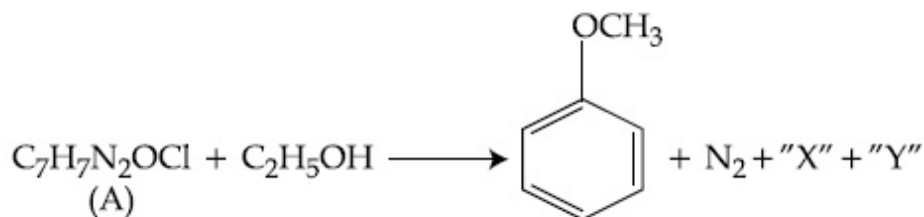
86435110682. Zymase and Invertase

86435110683. Invertase and Amylase

86435110684. Amylase and Invertase

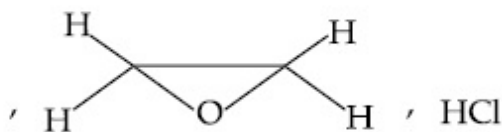
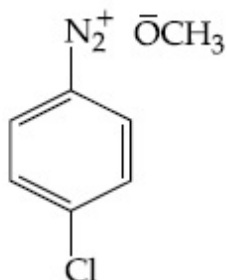
**Question Number : 47 Question Id : 8643513557 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



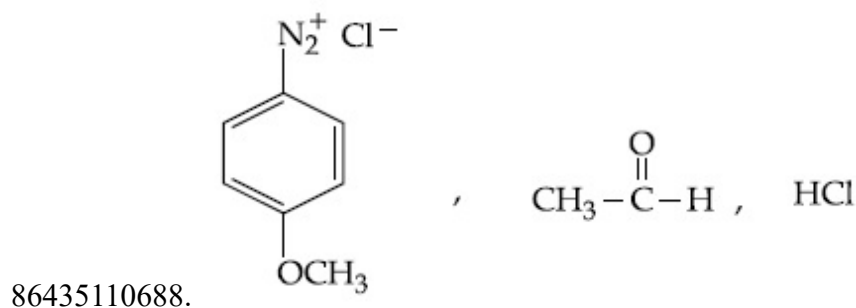
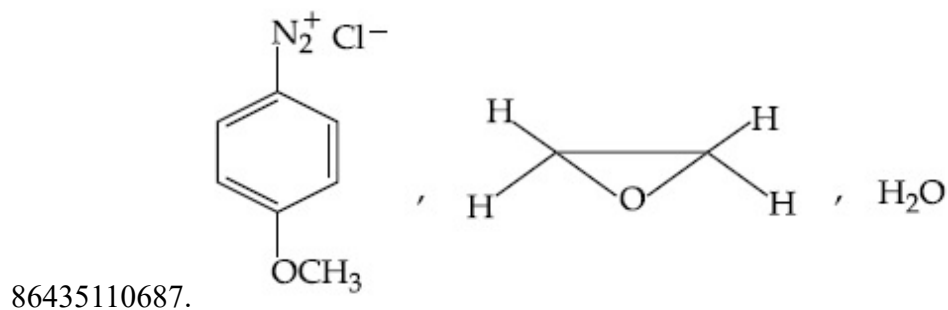
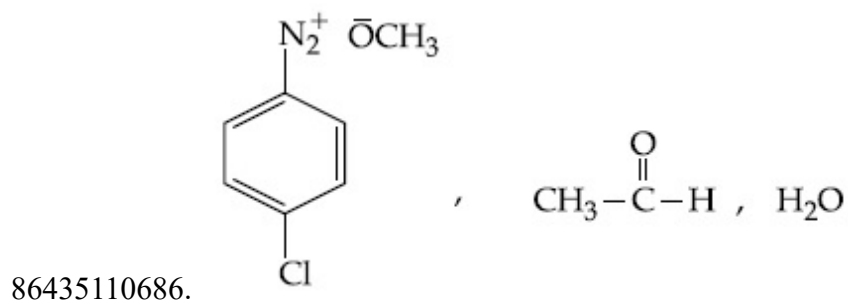
In the above reaction, the structural formula of (A), "X" and "Y" respectively are :

**Options :**



86435110685.





**Question Number : 48 Question Id : 8643513558 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Primary, secondary and tertiary amines can be separated using :

**Options :**

86435110689. Chloroform and KOH

86435110690. Benzene sulphonic acid

86435110691. para-Toluene sulphonyl chloride

86435110692. Acetyl amide

**Question Number : 49 Question Id : 8643513559 Question Type : MCQ Option Sh Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Match List - I with List - II.

List - I	List - II
Chemical Compound	Used as
(a) Sucralose	(i) Synthetic detergent
(b) Glyceryl ester of stearic acid	(ii) Artificial sweetener
(c) Sodium benzoate	(iii) Antiseptic
(d) Bithionol	(iv) Food preservative

Choose the correct match :

**Options :**

86435110693. (a)-(i), (b)-(ii), (c)-(iv), (d)-(iii)

86435110694. (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)

86435110695. (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)

86435110696. (a)-(iii), (b)-(ii), (c)-(iv), (d)-(i)

**Question Number : 50 Question Id : 8643513560 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Fructose is an example of :

**Options :**

86435110697. Aldohexose

86435110698. Ketohexose

86435110699. Pyranose

86435110700. Heptose

## Chemistry Section B

**Section Id :**

864351238

**Section Number :**

4

**Section type :**

Online

<b>Mandatory or Optional :</b>	Mandatory
<b>Number of Questions :</b>	10
<b>Number of Questions to be attempted :</b>	5
<b>Section Marks :</b>	20
<b>Mark As Answered Required? :</b>	Yes
<b>Sub-Section Number :</b>	1
<b>Sub-Section Id :</b>	864351238
<b>Question Shuffling Allowed :</b>	Yes

**Question Number : 51 Question Id : 8643513561 Question Type : SA**

**Correct Marks : 4 Wrong Marks : 0**

The number of chlorine atoms in 20 mL of chlorine gas at STP is \_\_\_\_\_  $10^{21}$ . (Round off to the Nearest Integer).

[Assume chlorine is an ideal gas at STP

$R = 0.083 \text{ L bar mol}^{-1} \text{ K}^{-1}$ ,  $N_A = 6.023 \times 10^{23}$ ]

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

100

**Question Number : 52 Question Id : 8643513562 Question Type : SA**

**Correct Marks : 4 Wrong Marks : 0**

KBr is doped with  $10^{-5}$  mole percent of  $\text{SrBr}_2$ . The number of cationic vacancies in 1 g of KBr crystal is \_\_\_\_\_  $10^{14}$ . (Round off to the Nearest Integer).

[Atomic Mass : K : 39.1 u, Br : 79.9 u

$N_A = 6.023 \times 10^{23}$ ]

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

100

**Question Number : 53 Question Id : 8643513563 Question Type : SA**

**Correct Marks : 4 Wrong Marks : 0**

In the ground state of atomic Fe( $Z=26$ ), the spin-only magnetic moment is \_\_\_\_\_  $\times 10^{-1}$  BM. (Round off to the Nearest Integer).

[Given :  $\sqrt{3} = 1.73$ ,  $\sqrt{2} = 1.41$ ]

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

100

**Question Number : 54 Question Id : 8643513564 Question Type : SA**

**Correct Marks : 4 Wrong Marks : 0**

A 1 molal  $K_4Fe(CN)_6$  solution has a degree of dissociation of 0.4. Its boiling point is equal to that of another solution which contains 18.1 weight percent of a non electrolytic solute A. The molar mass of A is \_\_\_\_\_ u. (Round off to the Nearest Integer).

[Density of water =  $1.0 \text{ g cm}^{-3}$ ]

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

100

**Question Number : 55 Question Id : 8643513565 Question Type : SA**

**Correct Marks : 4 Wrong Marks : 0**

Consider the reaction  $N_2O_4(g) \rightleftharpoons 2NO_2(g)$ . The temperature at which  $K_C = 20.4$  and  $K_P = 600.1$ , is \_\_\_\_\_ K. (Round off to the Nearest Integer).

[Assume all gases are ideal and  $R = 0.0831 \text{ L bar K}^{-1} \text{ mol}^{-1}$ ]

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

100

**Question Number : 56 Question Id : 8643513566 Question Type : SA**

**Correct Marks : 4 Wrong Marks : 0**

A KCl solution of conductivity  $0.14 \text{ S m}^{-1}$  shows a resistance of  $4.19 \Omega$  in a conductivity cell. If the same cell is filled with an HCl solution, the resistance drops to  $1.03 \Omega$ . The conductivity of the HCl solution is \_\_\_\_\_  $\times 10^{-2} \text{ S m}^{-1}$ . (Round off to the Nearest Integer).

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

100

**Question Number : 57 Question Id : 8643513567 Question Type : SA**

**Correct Marks : 4 Wrong Marks : 0**

The reaction  $2A + B_2 \rightarrow 2AB$  is an elementary reaction.

For a certain quantity of reactants, if the volume of the reaction vessel is reduced by a factor of 3, the rate of the reaction increases by a factor of \_\_\_\_\_. (Round off to the Nearest Integer).

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

100

**Question Number : 58 Question Id : 8643513568 Question Type : SA**

**Correct Marks : 4 Wrong Marks : 0**

On complete reaction of  $\text{FeCl}_3$  with oxalic acid in aqueous solution containing KOH, resulted in the formation of product A. The secondary valency of Fe in the product A is \_\_\_\_\_. (Round off to the Nearest Integer).

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

100

**Question Number : 59 Question Id : 8643513569 Question Type : SA**

Correct Marks : 4 Wrong Marks : 0

The total number of C-C sigma bond/s in mesityl oxide ( $C_6H_{10}O$ ) is \_\_\_\_\_. (Round off to the Nearest Integer).

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

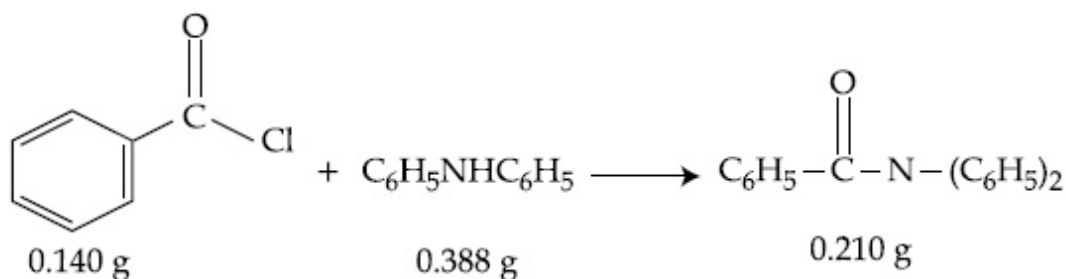
Text Areas : PlainText

Possible Answers :

100

Question Number : 60 Question Id : 8643513570 Question Type : SA

Correct Marks : 4 Wrong Marks : 0



Consider the above reaction. The percentage yield of amide product is \_\_\_\_\_. (Round off to the Nearest Integer).

(Given : Atomic mass : C : 12.0 u, H : 1.0 u, N : 14.0 u, O : 16.0 u, Cl : 35.5 u)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100