

EXERCISE - I (Conceptual Questions)

Build Up Your Understanding

1. Ether and benzene can be separated by :-  
 (1) Filtration (2) Distillation  
 (3) Crystallization (4) Sublimation

CEC028

2. Phenol on reaction with dilute nitric acid, gives two products. Which method will be most effective for large scale separation  
 (1) Chromatographic separation  
 (2) Fractional crystallisation  
 (3) Steam distillation  
 (4) Sublimation

CEC086

3. Correct match :-

|     | Mixture                |     | Purification technique              |
|-----|------------------------|-----|-------------------------------------|
| (A) | Chloroform and aniline | (P) | Distillation                        |
| (B) | Glycerol and Spentlye  | (Q) | Chromatography                      |
| (C) | Aniline and Water      | (R) | Steam distillation                  |
| (D) | Amino Acid             | (S) | Distillation under reduced pressure |

- (1) A-P, B-Q, C-R, D-S (2) A-P, B-S, C-R, D-Q  
 (3) A-P, B-R, C-S, D-Q (4) A-R, B-S, C-P, D-Q

CEC087

4. The substance which can be commonly used as an adsorbent in column chromatography is  
 (1) Na<sub>2</sub>O (2) NaCl (3) Al<sub>2</sub>O<sub>3</sub> (4) Alum

CEC088

5. The purification method where solid substance change from vapour state without passing through the liquid state is called as  
 (1) Sublimation  
 (2) Crystallization  
 (3) Distillation  
 (4) Differential extraction

CEC089

6. Chloroform (B.P. 334 K) and aniline (B.P. 457 K) are easily separated by the technique of  
 (1) Crystallisation (2) Distillation  
 (3) Sublimation (4) Chromatography

CEC090

7. **Statement-I** : Silica gel and alumina are used as adsorbent for adsorption chromatography. **Statement-II** : Paper chromatography is a type of partition chromatography. In the light of above statements, select the correct option.

- (1) Statement-I is true but statement-II is false  
 (2) Statement-I is false but statement-II is true  
 (3) Both statements-I and II are true  
 (4) Both statements-I and II are false

CEC091

8. In Lassaigne extract of an organic compound, both nitrogen and sulphur are present, which gives blood red colour with Fe<sup>3+</sup>, due to formation of

- (1) NaSCN  
 (2) [Fe(CN)<sub>5</sub>NOS]<sup>4-</sup>  
 (3) [Fe(SCN)]<sup>2+</sup>  
 (4) Fe<sub>4</sub>[Fe(CN)<sub>6</sub>]3-x H<sub>2</sub>O

CEC084

9. The formula of the purple/violet colour formed in Lassaigne's test for sulphur using sodium nitroprusside is

- (1) NaFe[Fe(CN)<sub>6</sub>]  
 (2) Na[Cr(NH<sub>3</sub>)<sub>2</sub>(NCS)<sub>4</sub>]  
 (3) Na<sub>2</sub>[Fe(CN)<sub>5</sub>(NO)]  
 (4) Na<sub>4</sub>[Fe(CN)<sub>5</sub>(NOS)]

CEC085

10. In carius method of estimation of halogen, 0.15 g of an organic compound gave 0.12g of AgBr. Find out the percentage of bromine in the compound.

- (1) 40% (2) 34.04%  
 (3) 43.04% (4) 53.04%

CEC092

EXERCISE-I (Conceptual Questions)

ANSWER KEY

| Question | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |  |
|----------|---|---|---|---|---|---|---|---|---|----|--|
| Answer   | 2 | 3 | 2 | 3 | 1 | 2 | 3 | 3 | 4 | 2  |  |

## EXERCISE - II (Previous Year Questions)

## AIPMT/NEET

## AIPMT 2014

1. In the Kjeldahl's method for estimation of nitrogen present in a soil sample, ammonia evolved from 0.75 g of sample neutralised 10 mL of 1 M  $\text{H}_2\text{SO}_4$ . The percentage of nitrogen in the soil is :  
(1) 37.33 (2) 45.33 (3) 35.33 (4) 43.33

CEC035

## AIPMT 2015

2. In Duma's method for estimation of nitrogen, 0.25 g of an organic compound gave 40 mL of nitrogen collected at 300 K temperature and 725 mm pressure. If the aqueous tension at 300 K is 25 mm, the percentage of nitrogen in the compound is :-  
(1) 18.20 (2) 16.76 (3) 15.76 (4) 17.36

CEC036

## NEET(UG) 2017

3. The most suitable method of separation of 1 : 1 mixture of ortho and para-nitrophenols is :  
(1) Chromatography (2) Crystallisation  
(3) Steam distillation (4) Sublimation

CEC037

## NEET(UG) 2020

4. Paper chromatography is an example of:  
(1) Column chromatography  
(2) Adsorption chromatography  
(3) Partition chromatography  
(4) Thin layer chromatography

CEC041

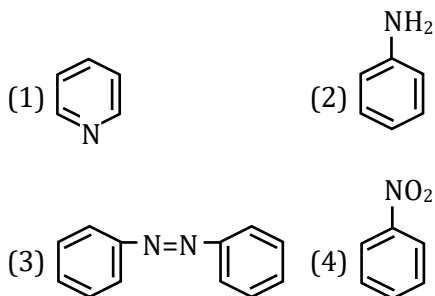
## NEET(UG) 2020 (COVID-19)

5. A liquid compound (x) can be purified by steam distillation only if it is  
(1) Steam volatile, immiscible with water  
(2) Not steam volatile, miscible with water  
(3) Steam volatile, miscible with water  
(4) Not steam volatile, immiscible with water

CEC044

## NEET(UG) 2022

6. The Kjeldahl's method for the estimation of nitrogen can be used to estimate the amount of nitrogen in which one of the following compounds ?



CEC093

## NEET(UG) 2023

7. Match List-I with List-II

| List-I<br>(Mixtures/Sample) |                         | List-II<br>(Technique used for purification) |                                     |
|-----------------------------|-------------------------|----------------------------------------------|-------------------------------------|
| (A)                         | Glycerol from spent lye | (I)                                          | Steam distillation                  |
| (B)                         | Chloroform + Aniline    | (II)                                         | Fractional distillation             |
| (C)                         | Fractions of crude oil  | (III)                                        | Distillation under reduced pressure |
| (D)                         | Aniline + Water         | (IV)                                         | Distillation                        |

Choose the **correct** answer from the options given below :

- (1) (A)-(III), (B)-(IV), (C)-(II), (D)-(I)  
(2) (A)-(IV), (B)-(II), (C)-(I), (D)-(III)  
(3) (A)-(I), (B)-(II), (C)-(III), (D)-(IV)  
(4) (A)-(I), (B)-(III), (C)-(II), (D)-(IV)

CEC094

NEET(UG) 2024

8. On heating, some solid substances change from solid to vapour state without passing through liquid state. The technique used for the purification of such solid substances based on the above principle is known as :
- (1) Crystallization      (2) Sublimation  
(3) Distillation      (4) Chromatography

CEC095

NEET(UG) 2024 (Re-examination)

9. A steam volatile organic compound which is immiscible with water has a boiling point of 250°C. During steam distillation, a mixture of this organic compound and water will boil
- (1) above 100°C but below 250°C  
(2) above 250°C  
(3) at 250°C  
(4) close to but below 100°C

CEC096

10. On complete combustion, 0.3 g of an organic compound gave 0.2 g of CO<sub>2</sub> and 0.1 g of H<sub>2</sub>O. The percentage composition of carbon and hydrogen in the compound, respectively is :
- (1) 4.07 % and 15.02%  
(2) 18.18% and 3.70%  
(3) 15.02% and 4.07%  
(4) 3.70% and 18.18%

CEC097

EXERCISE-II (Previous Year Questions)

ANSWER KEY

| Question | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |  |
|----------|---|---|---|---|---|---|---|---|---|----|--|
| Answer   | 1 | 2 | 3 | 3 | 1 | 2 | 1 | 2 | 4 | 2  |  |

## EXERCISE - III (Analytical Questions)

## Master Your Understanding

1. Match the column :-

| Column-I<br>Nature of compound/<br>impurity |                                                                   | Column-II<br>Purification<br>technique |                                     |
|---------------------------------------------|-------------------------------------------------------------------|----------------------------------------|-------------------------------------|
| (a)                                         | Liquids having sufficient difference in boiling point             | (p)                                    | Fractional distillation             |
| (b)                                         | Difference of boiling points of liquids is not much.              | (q)                                    | Distillation                        |
| (c)                                         | Compounds which decompose at or below their boiling point         | (r)                                    | Steam distillation                  |
| (d)                                         | Substances which are steam volatile and are immiscible with water | (s)                                    | Distillation under reduced pressure |

(1) a = q, b = p, c = r, d = s

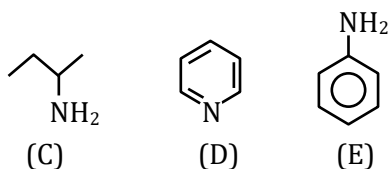
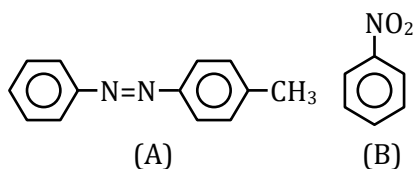
(2) a = p, b = q, c = s, d = r

(3) a = q, b = p, c = s, d = r

(4) a = p, b = q, c = r, d = s

CEC080

2. For which of the following compounds Kjeldahl method is not used for estimation of nitrogen ?



(1) A, B, D and E

(2) A, B and D

(3) A and D

(4) D and E

CEC079

3. Match the column :-

| Column-I<br>Test product for<br>element detection |                                                                   | Column-II<br>Colour |               |
|---------------------------------------------------|-------------------------------------------------------------------|---------------------|---------------|
| (a)                                               | $[\text{Fe}(\text{CN})_5\text{NOS}]^{4-}$                         | (p)                 | Prussian blue |
| (b)                                               | $[\text{Fe}(\text{SCN})]^{2+}$                                    | (q)                 | Blood red     |
| (c)                                               | $(\text{NH}_4)_3\text{PO}_4 \cdot 12\text{MoO}_3$                 | (r)                 | Violet        |
| (d)                                               | $\text{Fe}_4[\text{Fe}(\text{CN})_6]_3 \cdot x\text{H}_2\text{O}$ | (s)                 | Yellow        |

(1) a = q, b = s, c = r, d = p

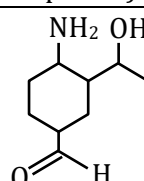
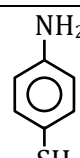
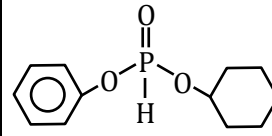
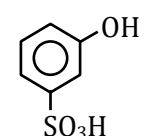
(2) a = p, b = q, c = r, d = s

(3) a = q, b = r, c = s, d = p

(4) a = r, b = q, c = s, d = p

CEC081

4. Match the column :-

| Column-I<br>(Compound) |                                                                                      | Column-II<br>(Observe test) |                                                                                                                                  |
|------------------------|--------------------------------------------------------------------------------------|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| (a)                    |  | (p)                         | Oxidised product gives yellow precipitate with $\text{HNO}_3$ followed by $(\text{NH}_4)_2\text{MoO}_4$                          |
| (b)                    |  | (q)                         | Sodium fusion extract gives blood red colour with $\text{Fe}^{+3}$                                                               |
| (c)                    |  | (r)                         | Sodium fusion extract gives black precipitate with $(\text{CH}_3\text{COO})_2\text{Pb}$                                          |
| (d)                    |  | (s)                         | Sodium fusion extract gives blue colour when treated with $\text{FeSO}_4$ followed by heating with conc. $\text{H}_2\text{SO}_4$ |

(1) a = q, b = s, c = p, d = r

(2) a = s, b = q, c = p, d = r

(3) a = r, b = p, c = q, d = s

(4) a = s, b = p, c = q, d = r

CEC082

5. Match the column :-

| Column-I<br>(Method of detection/estimation of element) |                   | Column-II<br>(Final form of element in compound) |                 |
|---------------------------------------------------------|-------------------|--------------------------------------------------|-----------------|
| (a)                                                     | Kjeldahl's method | (p)                                              | NH <sub>3</sub> |
| (b)                                                     | Carius method     | (q)                                              | NaCN            |
| (c)                                                     | Dumas method      | (r)                                              | N <sub>2</sub>  |
| (d)                                                     | Lassaigne's test  | (s)                                              | AgCl            |

(1) a = r, b = p, c = r, d = s

(2) a = q, b = p, c = r, d = s

(3) a = p, b = s, c = r, d = q

(4) a = r, b = s, c = p, d = q

CEC083

EXERCISE-III (Analytical Questions)

ANSWER KEY

| Question | 1 | 2 | 3 | 4 | 5 |  |
|----------|---|---|---|---|---|--|
| Answer   | 3 | 2 | 4 | 2 | 3 |  |