

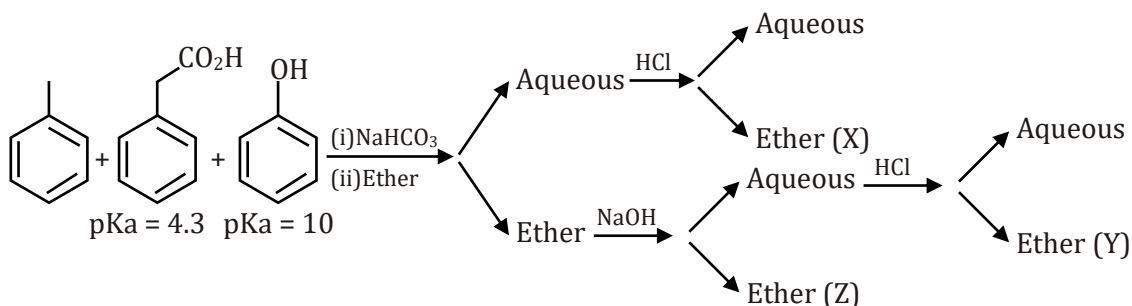
EXERCISE - O

SINGLE CORRECT TYPE QUESTIONS

Acid-Base Reaction

1. Which of the following has molecular weight of 92 ?
 (A) Toluene (B) Benzene (C) Methanol (D) Propene
2. Choose the answer that has the following compounds located correctly in the separation scheme.

CP0068

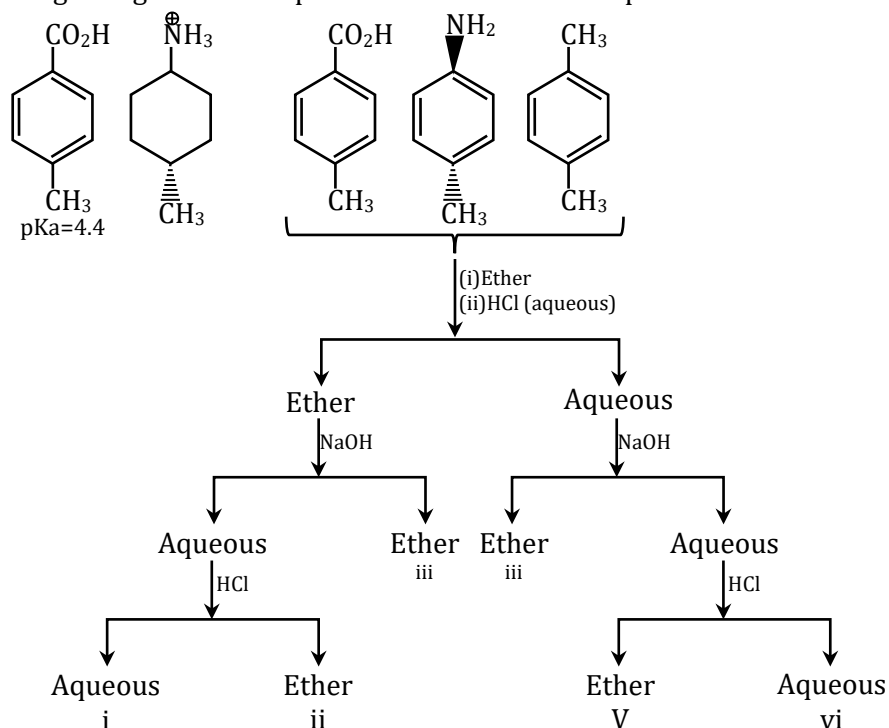


- (A) toluene is in (Y); phenylacetic acid is in (Y); phenol is in (Z)
 (B) toluene is in (Y); phenylacetic acid is in (X); phenol is in (Z)
 (C) toluene is in (Z); phenylacetic acid is in (Y); phenol is in (X)
 (D) toluene is in (Z); phenylacetic acid is in (X); phenol is in (Y)

CP0069

Passage-1 (Q. 3 to 5)

A student in a lab had a mixture of three compounds, 4-methylbenzoic acid, 4-methylcyclohexylamine and 1,4-dimethylbenzene. In order to separate the three compounds the following extraction (separation) scheme was followed. At the end of the procedure the student had six separate flasks containing either an aqueous or an ether solution. Locate each compound by designating the flask expected to contain each compound. some relevant pK_a data is given.



3. Which flask contains the 4-methylcyclohexylamine ?
 (A) 1 (B) 2 (C) 3 (D) 4 **CP0070**
4. Which flask contains the 4-methylbenzoic acid?
 (A) 1 (B) 2 (C) 3 (D) 4 **CP0071**
5. Which flask contains the 1,4- dimethylbenzene?
 (A) 1 (B) 2 (C) 3 (D) 4 **CP0072**

Separation & Purification of organic compounds

6. For the Separation of two immiscible liquids which method (or apparatus) is used?
 (A) Chromatography (B) Fractionating column
 (C) Fractional distillation (D) Separating funnel / Decantation **CP0073**
7. Aniline is usually purified by
 (A) Chromatographic technique (B) Steam distillation
 (C) By addition of oxalic acid (D) Fractional crystallization **CP0074**
8. The most suitable method for separation of 1:1 mixture of ortho- and para- nitrophenols is
 (A) Sublimation (B) Chromatography (C) Crystallization (D) Steam distillation **CP0075**
9. Distillation under reduced pressure is employed for:
 (A) Benzene (B) Petrol
 (C) Glycerol (D) Organic compound used in medicine **CP0076**
10. In sodium fusion test of organic compound the nitrogen of organic compound is converted into
 (A) Sodamide (B) Sodium cyanide (C) Sodium nitrite (D) Sodium nitrate **CP0077**
11. The latest technique used for purification for organic compounds is
 (A) Chromatography (B) Sublimation
 (C) Fractional distillation (D) Crystallisation **CP0078**
12. In paper chromatography
 (A) Mobile phase is liquid and stationary phase is solid
 (B) Mobile phase is liquid and stationary phase is liquid
 (C) Mobile phase is solid and stationary phase is solid
 (D) Mobile phase is solid and stationary phase is liquid **CP0079**
13. The Lassaigne's extract is boiled with dil. HNO_3 before testing for halogens because
 (A) Silver halides are soluble in HNO_3
 (B) Na_2S and NaCN are decomposed by HNO_3
 (C) Ag_2S is soluble in HNO_3
 (D) AgCN is soluble in HNO_3 **CP0080**
14. In a Lassaigne's test for nitrogen, the blue colour is due to the formation of
 (A) Potassium ferricyanide (B) Sodium cyanide
 (C) Sodium ferrocyanide (D) Ferri-ferro cyanide **CP0081**

15. Which of the following compounds does not show Lassaigne test for nitrogen?
(A) Urea (B) Hydrazine (C) Phenyl hydrazine (D) Azo benzene **CP0082**
16. When piece of human hair are heated strongly with soda lime, smell of ammonia can be detected. which one of the following conclusion can be drawn from this observation?
(A) Ammonia is present in human hair (B) Ammonium salt is present in hair
(C) Hair contains amino acids (D) None of the above **CP0083**
17. The Beilstein test for organic compounds is used to detect
(A) Nitrogen (B) Sulphur (C) Carbon (D) Halogen **CP0084**
18. Which of the following is the best scientific method to test presence of water in liquid?
(A) Smell (B) Taste
(C) Use of litmus paper (D) Use of anhydrous copper sulphate **CP0085**

Quantitative Analysis

19. In Kjeldahl's method, nitrogen present is estimated as
(A) N_2 (B) NO (C) NH_3 (D) NO_2 **CP0086**
20. Liebig's method is used for the estimation of
(A) Nitrogen (B) Sulphur
(C) Carbon and hydrogen (D) Halogens **CP0087**
21. 0.765 gm of an acid gives 0.535 gm of CO_2 and 0.138 gm of H_2O . Then the ratio of percentage of carbon and hydrogen is
(A) 19 : 2 (B) 18:11 (C) 20:17 (D) 1:7 **CP0088**
22. Nitrogen is an organic compound can be estimated by
(A) Kjeldahl's method only (B) Duma's method only
(C) Both the methods (D) None of these methods **CP0089**
23. Dumas method involves the determination of nitrogen content in the organic compound in form of
(A) NH_3 (B) N_2 (C) NaCN (D) $(NH_4)_2SO_4$ **CP0090**

Passage-2 (Q. 24 to 28)

The 0.2 g of anhydrous organic acid gave on combustion 0.04 g of water and 0.195 g of CO_2 , The acid is a dibasic acid and 0.5 g of its silver salt leaves on ignition 0.355 g of silver.

24. The percentage of carbon in the compound is
(A) 50 (B) 52 (C) 26.6 (D) 90 **CP0091**
25. The percentage of hydrogen in the compound is
(A) 5.6 (B) 2.22 (C) 4.44 (D) 10 **CP0092**
26. The empirical weight of the compound is
(A) 90 (B) 100 (C) 10 (D) 45 **CP0093**

27. The molecular weight of the compound is
 (A) 90 (B) 100 (C) 10 (D) 45 CP0094
28. The molecular formula of the compound is
 (A) CHO (B) CHO₂ (C) C₂H₂O₄ (D) C₃H₆O₂ CP0095

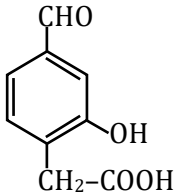
Test of Functional Group

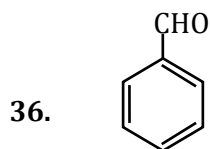
29. Phenol can be distinguished from ethanol by
 (A) Tollen's reagent (B) Benedict's reagent
 (C) FeCl₃ (D) Schiff's base CP0096
30. p-Cl-C₆H₄NH₂ and PhNH₃⁺Cl⁻ can be distinguished by
 (A) NaOH (B) AgNO₂ (C) LiAlH₄ (D) Zn CP0097

MULTIPLE CORRECT TYPE QUESTIONS

Test of Functional Group

31. Which of the following will respond to iodoform test?
 (A) $\text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\text{COOH}$ (B) $\text{CH}_3-\overset{\text{OH}}{\text{CH}}-\text{COOH}$ (C) $\text{CH}_3-\overset{\text{OH}}{\text{CH}}-\text{CH}_3$ (D) CH₃CH₂OH CP0098
32. Which of the following will not show iodoform test?
 (A) $\text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}_3$ (B) $\text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\text{Cl}$ (C) $\text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\text{NH}_3$ (D) CH₃-COOH CP0099

33. An organic compound has the structure . It will give
 (A) ceric ammonium nitrate test
 (B) brick effervescence with sodium bicarbonate
 (C) a characteristic colouration with neutral ferric chloride after decarboxylation and reduction by Clemenson's method
 (D) Fehling's test CP0100
34. Compound A reacts with CHCl₃ and KOH and gives an offensive smelling compound. A can be
 (A) Primary aliphatic amine
 (B) Primary aromatic amine
 (C) Secondary amine
 (D) Tertiary amine CP0101
35. HCOOH and HCHO may be distinguished by
 (A) Tollen's test (B) Sodium bicarbonate test
 (C) 2,4-DNP test (D) Benedict's test CP0102



and CH_3CHO can be distinguished By

- (A) Tollen's test (B) Benedict's test
(C) Iodoform test (D) 2,4-DNP test

CP0103

37. Acetic acid and CH_3COCl can be distinguished by

- (A) NaHCO_3 test (B) Na metal test
(C) Ester formation test (D) $\text{Br}_2(\text{aq.})$ test

CP0104

MATRIX MATCH TYPE QUESTION

Test of Functional Group

38. Match the column-I and Column-II

	Column I (reagents)		Column II
(a)	Tollen's reagent gives white ppt/. with	(p)	$\text{Me}-\text{CH}=\text{CH}-\text{Me}$
(b)	$\text{Br}_2 + \text{H}_2\text{O}$ test given by	(q)	$\text{Me}-\text{C}\equiv\text{C}-\text{H}$
(c)	Product of reaction of acetylene with 1% HgSO_4 and Dil. H_2SO_4	(r)	$\text{Cl}^\ominus \text{NH}_3^\oplus - \text{NH}_2$
(d)	Pd/H_2 reacts with	(s)	$\text{Me}-\overset{\text{O}}{\parallel}{\text{C}}-\text{H}$
		(t)	$\text{Me}-\overset{\text{O}}{\parallel}{\text{C}}-\text{Me}$

(A) (a→qr), (b→pq), (c→s), (d→pqst)

(B) (a→qr), (b→q), (c→t), (d→pst)

(C) (a→pr), (b→pq), (c→p), (d→st)

(D) (a→ts), (b→rs), (c→s), (d→qst)

CP0105

39. Match the column-I and Column-II

- Column-I
(Pair of compounds)
- (a) $\text{Ph}-\overset{\text{O}}{\parallel}{\text{C}}-\text{H}$ and $\text{Me}-\overset{\text{O}}{\parallel}{\text{C}}-\text{H}$
- (b) $\text{Me}-\overset{\text{O}}{\parallel}{\text{C}}-\text{Me}$ and $\text{Me}-\overset{\text{O}}{\parallel}{\text{C}}-\text{H}$
- (c)  and 
- (d) $\text{Me}-\text{C}\equiv\text{C}-\text{H}$ and $\text{Me}-\text{C}\equiv\text{C}-\text{Me}$
- (A) (a→q), (b→pq), (c→rt), (d→s)
(C) (a→r), (b→st), (c→rs), (d→p)

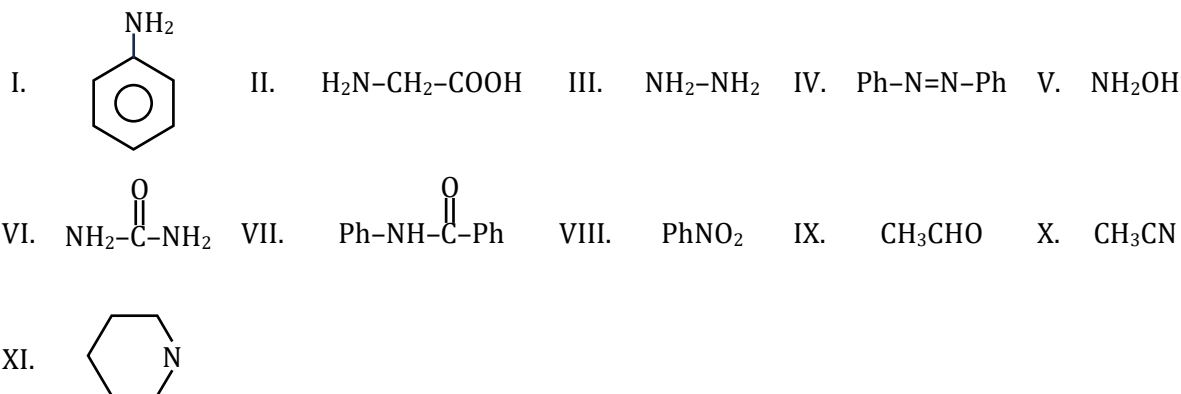
- Column-II
(Test of identification)
- (p) Tollen's reagent
- (q) Fehling's reagent
- (r) Iodoform test
- (s) Victor Meyer's test
- (t) Lucas test
- (B) (a→qr), (b→pq), (c→rst), (d→p)
(D) (a→pq), (b→rs), (c→st), (d→r)

CP0106

EXERCISE - S

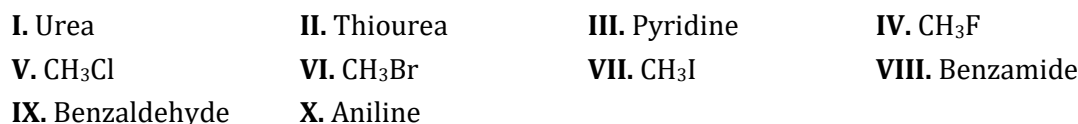
Qualitative Analysis

1. Amongst the following, the total number of compound which does not give Lassaigne's test for nitrogen.



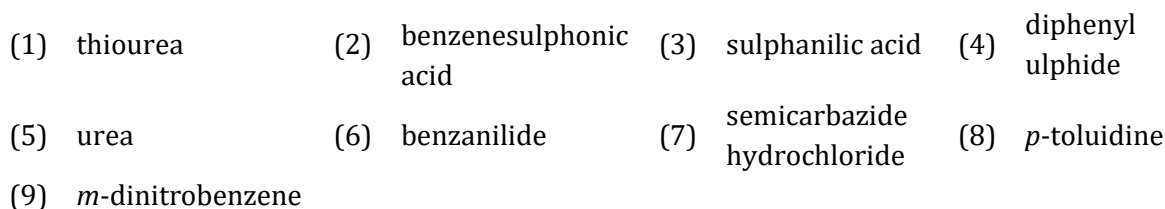
CP0107

2. Amongst the following compounds the total number of compounds which give Beilstein test.



CP0108

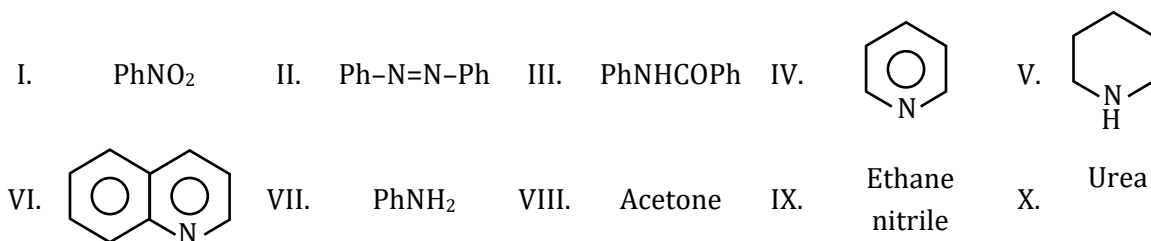
3. Amongst the following, the total number of compounds which are expected to give blood red colouration when FeCl_3 is added to their respective Lassaigne's extract is:



CP0109

Quantitative Analysis

4. Amongst the following Kjeldahl's method can't be used for.



CP0110

5. 0.50 g of an organic compound was treated according to Kjeldahl's method. The ammonia evolved was absorbed in 50 mL of 0.5 M H_2SO_4 . The residual acid required 60 mL of M/2 NaOH solution. Find the percentage of nitrogen in the compound.

CP0111

6. 0.4 g of an organic compound was treated according to Kjeldahl's method. The ammonia evolved was absorbed in 50 mL of 0.5 M H_3PO_3 . The residual acid required 30 mL of 0.5 M $\text{Ca}(\text{OH})_2$. Find the percentage of N_2 in the compound. **CP0112**
7. 0.002 g of an organic compound was treated according to Kjeldahl's method. 0.2×10^{-4} mol of H_2SO_4 was required to neutralize NH_3 . Calculate the percentage of N **CP0113**
8. 0.12 g of an organic compound containing phosphorus gave 0.22 g of $\text{Mg}_2\text{P}_2\text{O}_7$ by the usual analysis. Calculate the percentage of phosphorus in the compound. **CP0114**

Test of Functional Group

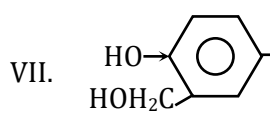
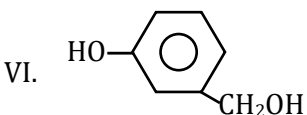
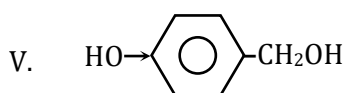
9. Amongst the following compounds the total number of compounds which gives coloured test with both ceric ammonium nitrate (CAN) and neutral FeCl_3 solution.

I. Phenol

II. Benzyl alcohol

III. Benzaldehyde

IV. Aniline

VIII. $\text{PhCH}_2\text{CH}(\text{OH})\text{CH}_3$

IX. Urea

X. Thiourea

CP0115

EXERCISE - JEE (Main) PYQ

1. Match List-I with List-II

[JEE (Main) 2021]

	List-I Test/Reagents/Observation(s)		List-II Species detected
(a)	Lassaigne's Test	(i)	Carbon
(b)	Cu(II) oxide	(ii)	Sulphur
(c)	Silver nitrate	(iii)	N, S, P, and halogen
(d)	The sodium fusion extract gives black precipitate with acetic acid and lead acetate	(iv)	Halogen Specifically

The correct match is :

- (1) (a)-(iii), (b)-(i), (c)-(ii), (d)-(iv)
 (2) (a)-(i), (b)-(iv), (c)-(iii), (d)-(ii)
 (3) (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)
 (4) (a)-(i), (b)-(ii), (c)-(iv), (d)-(iii)

CP0116

2. Given below are two statements : One is labelled as **Assertion A** and the other is labelled as **Reason R**.
Assertion A : Thin layer chromatography is an adsorption chromatography.

Reason R : A thin layer of silica gel is spread over a glass plate of suitable size in thin layer chromatography which acts as an adsorbent.

In the light of the above statements, choose the **correct** answer from the options given below

[JEE (Main) 2022]

- (1) Both A and R are true and R is the correct explanation of A
 (2) Both A and R are true but R is NOT the correct explanation of A
 (3) A is true but R is false
 (4) A is false but R is true

CP0117

3. A sample of 0.125 g of an organic compound when analysed by Duma's method yields 22.78 mL of nitrogen gas collected over KOH solution at 280K and 759 mm Hg. The percentage of nitrogen in the given organic compound is _____. (Nearest integer).

[JEE (Main) 2022]

Given:

- (A) The vapour pressure of water at 280 K is 14.2 mm Hg
 (B) $R = 0.082 \text{ L atm K}^{-1} \text{ mol}^{-1}$

CP0118

4. In sulphur estimation. 0.471 g of an organic compound gave 1.4439 g of barium sulphate. The percentage of sulphur in the compound is _____ (Nearest Integer)

(Given: Atomic mass Ba: 137 u; S: 32 u, O: 16 u)

[JEE (Main) 2023]

CP0119

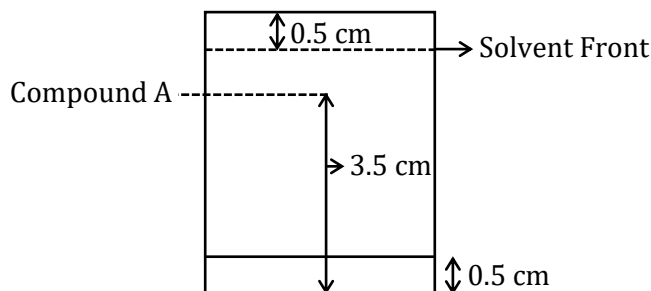
5. Compound that will give positive Lassaigne's test for both nitrogen and halogen is

[JEE (Main) 2023]

- (1) $\text{N}_2\text{H}_4 \cdot \text{HCl}$ (2) $\text{CH}_3\text{NH}_2 \cdot \text{HCl}$
 (3) NH_4Cl (4) $\text{NH}_2\text{OH} \cdot \text{HCl}$

CP0120

6. Following chromatogram was developed by adsorption of compound 'A' on a 6 cm TLC glass plate. Retardation factor of the compound 'A' is $\text{---} \times 10^{-1}$. [JEE (Main) 2023]



CP0121

7. When 0.01 mol of an organic compound containing 60% carbon was burnt completely, 4.4 g of CO_2 was produced. The molar mass of compound is $\text{---} \text{ g mol}^{-1}$ (Nearest integer) [JEE (Main) 2023]

CP0122

8. Match List I with List II: [JEE (Main) 2023]

List I (Mixture)		List II (Separation Technique)	
(A)	$\text{CHCl}_3 + \text{C}_6\text{H}_5\text{NH}_2$	I	Steam distillation
(B)	$\text{C}_6\text{H}_{14} + \text{C}_5\text{H}_{12}$	II	Differential extraction
(C)	$\text{C}_6\text{H}_5\text{NH}_2 + \text{H}_2\text{O}$	III	Distillation
(D)	Organic compound in H_2O	IV	Fractional distillation

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

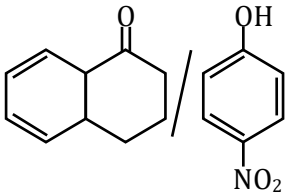
(2) A-III, B-IV, C-I, D-II

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

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

CP0123

9. Match items of column I and II [JEE (Main) 2023]

	Column I (Mixture of compounds)		Column II (Separation Technique)
A.	$\text{H}_2\text{O}/\text{CH}_2\text{Cl}_2$	i.	Crystallization
B.		ii.	Differential solvent extraction
C.	Kerosene/Naphthalene	iii.	Column chromatography
D.	$\text{C}_6\text{H}_{12}\text{O}_6/\text{NaCl}$	iv.	Fractional Distillation

Correct match is :

(1) A-(iii), B-(iv), C-(ii), D-(i)

(2) A-(i), B-(iii), C-(ii), D-(iv)

(3) A-(ii), B-(iii), C-(iv), D-(i)

(4) A-(ii), B-(iv), C-(i), D-(iii)

CP0124

10. On complete combustion, 0.492 g of an organic compound gave 0.792 g of CO_2 . The % of carbon in the organic compound is --- (Nearest integer) [JEE (Main) 2023]

CP0125

11. In Dumas method for the estimation of N_2 , the sample is heated with copper oxide and the gas evolved is passed over : [JEE (Main) 2023]
 (1) Ni (2) Copper gauze (3) Pd (4) Copper oxide

CP0126

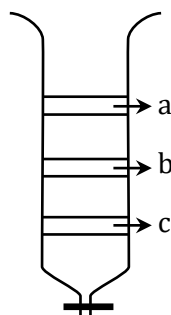
12. Match List I with List II [JEE (Main) 2023]

List I Element detected		List II Reagent used/ Product formed	
A	Nitrogen	I.	$Na_2[Fe(CN)_5 NO]$
B	Sulphur	II.	$AgNO_3$
C	Phosphorous	III.	$Fe_4[Fe(CN)_6]_3$
D	Halogen	IV.	$(NH_4)_2 MoO_4$

Choose the correct answer from the options given below:

- (1) A-II, B-IV, C-I, D-III (2) A-IV, B-II, C-I, D-III
 (3) A-II, B-I, C-IV, D-III (4) A-III, B-I, C-IV, D-II CP0127

13. From the figure of column chromatography given below, identify incorrect statements. [JEE (Main) 2023]



- A. Compound 'c' is more polar than 'a' and 'b'
 B. Compound 'a' is least polar
 C. Compound 'b' comes out of the column before 'c' and after 'a'
 D. Compound 'a' spends more time in the column

Choose the correct answer from the options given below :-

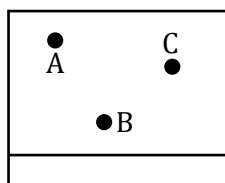
- (1) A, B and C only (2) B, C and D only (3) A, B and D only (4) B and D only CP0128
14. Using column chromatography, mixture of two compounds 'A' and 'B' was separated. 'A' eluted first, this indicates 'B' has [JEE (Main) 2023]
 (1) low R_f , weaker adsorption
 (2) high R_f , stronger adsorption
 (3) high R_f , weaker adsorption
 (4) low R_f , stronger adsorption

CP0129

15. In Carius tube, an organic compound 'X' is treated with sodium peroxide to form a mineral acid 'Y'. The solution of $BaCl_2$ is added to 'Y' to form a precipitate 'Z'. 'Z' is used for the quantitative estimation of an extra element. 'X' could be: [JEE (Main) 2023]
 (1) Cytosine (2) Chloroxylenol
 (3) A nucleotide (4) Methionine

CP0130

16. Thin layer chromatography of a mixture shows the following observation :



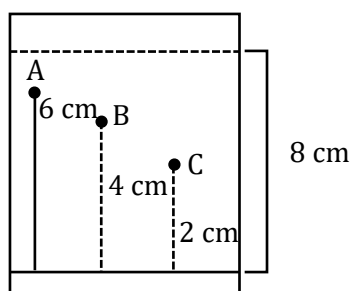
The correct order of elution in the silica gel column chromatography is [JEE (Main) 2023]

- (1) A, C, B (2) B, C, A (3) C, A, B (4) B, A, C

CP0131

17. Three organic compounds A, B and C were allowed to run in thin layer chromatography using hexane and gave the following result (see figure). The R_f value of the most polar compound is $___ \times 10^{-2}$

[JEE (Main) 2023]



CP0132

18. An organic compound gives 0.220 g of CO_2 and 0.126 g of H_2O on complete combustion. If the % of carbon is 24 then the % hydrogen is $_____ \times 10^{-1}$. (Nearest integer) [JEE (Main) 2023]

CP0133

19. 0.400 g of an organic compound (X) gave 0.376 g of AgBr in Carius method for estimation of bromine. % of bromine in the compound (X) is $_____$.

Given: Molar mass AgBr = 188 g mol^{-1} Br = 80 g mol^{-1}

[JEE (Main) 2023]

CP0134

20. Which of the following statement is correct for paper chromatography ? [JEE (Main) 2023]

- (1) Water present in the mobile phase gets absorbed by the paper which then forms the stationary phase.
 (2) Water present in the pores of the paper forms the stationary phase.
 (3) Paper sheet forms the stationary phase.
 (4) Paper and water present in its pores together form the stationary phase.

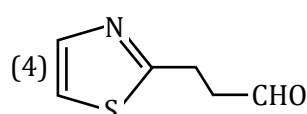
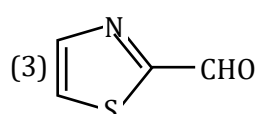
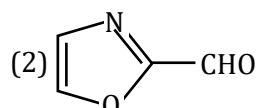
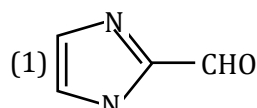
CP0135

21. Which of the following compounds would give the following set of qualitative analysis ?

(i) Fehling's Test : Positive

(ii) Na fusion extract upon treatment with sodium nitroprusside gives a blood red colour but not

[JEE (Main) 2023]



CP0136

EXERCISE - JEE (Advanced) PYQ

1. For the identification of β -naphthol using dye test, it is necessary to use

[JEE (Advanced) 2014]

- (A) dichloromethane solution of β -naphthol
 (B) acidic solution of β -naphthol
 (C) neutral solution of β -naphthol
 (D) alkaline solution of β -naphthol

CP0060

2. Match the compounds in LIST-I with the observation in LIST-II, and choose the correct option.

	LIST-I		LIST-II
(I)	Aniline	(P)	Sodium fusion extract of the compound on boiling with FeSO_4 , followed by acidification with conc. H_2SO_4 , gives Prussian blue color.
(II)	o-Cresol	(Q)	Sodium fusion extract of the compound on treatment with sodium nitroprusside gives blood red color.
(III)	Cysteine	(R)	Addition of the compound to a saturated solution of NaHCO_3 results in effervescence.
(IV)	Coprolactam	(S)	The compound reacts with bromine water to give a white precipitate.
		(T)	Treating the compound with neutral FeCl_3 solution produces violet colour.

[JEE (Advanced) 2022]

- (A) $\text{I} \rightarrow \text{P, Q}$; $\text{II} \rightarrow \text{S}$; $\text{III} \rightarrow \text{Q, R}$; $\text{IV} \rightarrow \text{P}$
 (B) $\text{I} \rightarrow \text{P}$; $\text{II} \rightarrow \text{R, S}$; $\text{III} \rightarrow \text{R}$; $\text{IV} \rightarrow \text{Q, S}$
 (C) $\text{I} \rightarrow \text{Q, S}$; $\text{II} \rightarrow \text{P, T}$; $\text{III} \rightarrow \text{P}$; $\text{IV} \rightarrow \text{S}$
 (D) $\text{I} \rightarrow \text{P, S}$; $\text{II} \rightarrow \text{T}$; $\text{III} \rightarrow \text{Q, R}$; $\text{IV} \rightarrow \text{P}$

CP0067

JEE (Main) Practice Paper

This paper is for yourself practice and assessment the discussion of this paper is optional though you can see PDF solutions or video solutions or solutions in hardcopy whichever is provided.

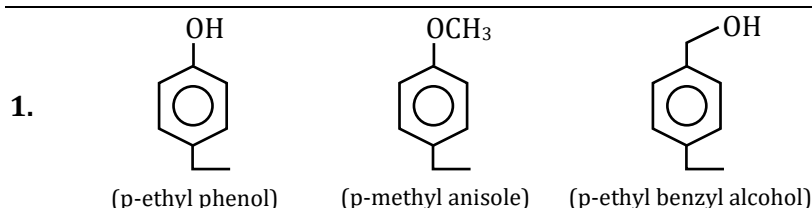
SECTION-A

- This section contains **TWENTY** questions.
- Each question has **FOUR** options (1), (2), (3) and (4). **ONLY ONE** of these four options is correct.
- For each question, darken the bubble corresponding to the correct option in the ORS.
- For each question, marks will be awarded in one of the following categories :

Full Marks : +4, if only the bubble corresponding to the correct option is darkened.

Zero Marks : 0, if none of the bubbles is darkened.

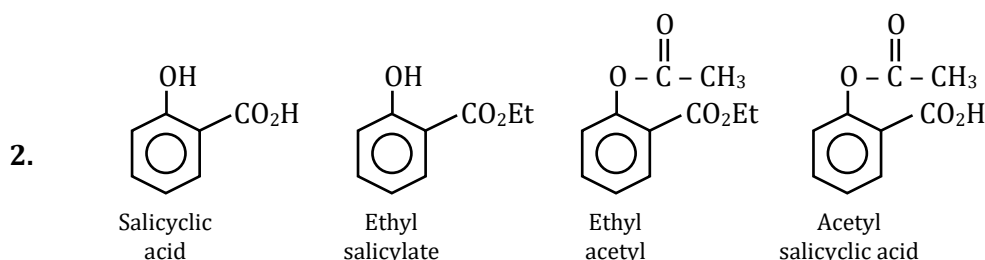
Negative Marks : -1 in all other cases



Above compounds can be differentiated by using the reagent:

- (1) NaOH, Tollen's reagent, FeCl₃ (2) CrO₃, Tollen's reagent, FeCl₃
 (3) Tollen's reagent, CrO₃, FeCl₃ (4) Na, Tollen's reagent, FeCl₃

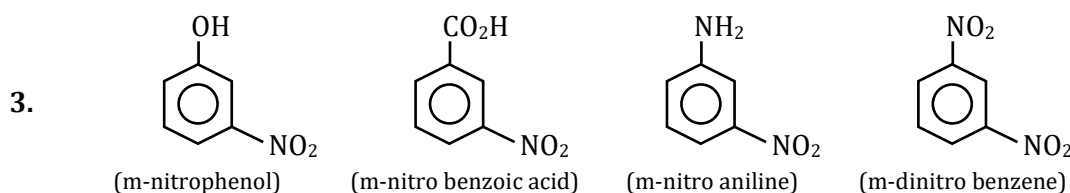
CP0137



Above compounds can be differentiated by the salicylate. Which of the following chemical test? (used in decreasing order)

- (1) NaOH, FeCl₃, NaHCO₃ (2) aq. NaHCO₃, FeCl₃, NaOH
 (3) NaOI, NaOH, NaHCO₃ (4) NaOH, Na, NaHCO₃

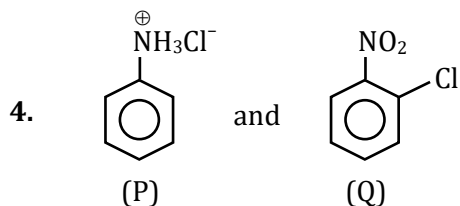
CP0138



Above compounds can be differentiated by which of the following chemical test? (used in decreasing order)

- (1) NaOH, NaHCO₃, HCl (2) HCl, NaOH, NaHCO₃
 (3) NaHCO₃, NaOH, HCl (4) NaOH, HCl, NaHCO₃

CP0139



Above compounds (P) & (Q) can be differentiated by:

- (1) amm. AgNO₃ (2) NaOH (3) FeCl₃ (4) Both (a) & (b)

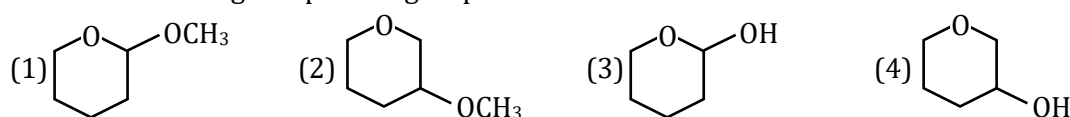
CP0140

5. Which of following acid give positive Tollen's reagent test.

- (1) $(\text{CH}_2)_2 \begin{matrix} \diagup \text{CO}_2\text{H} \\ \diagdown \text{CO}_2\text{H} \end{matrix}$ (2) $\text{CH}_2 \begin{matrix} \diagup \text{CO}_2\text{H} \\ \diagdown \text{CO}_2\text{H} \end{matrix}$ (3) $\begin{matrix} \text{CO}_2\text{H} \\ | \\ \text{CO}_2\text{H} \end{matrix}$ (4) HCO₂H

CP0141

6. Which of following compounds give positive Tollen's test?



CP0142

7. Give a simple test to differentiate cyclohexane and cyclohexene

- (1) Br₂/H₂O (2) Bayer's reagent (3) Tollen's reagent (4) Both (1) and (2)

CP0143

8. Give test to differentiate 1, 1-dichloroethane and 1, 2-dichloroethane :

- (1) 2,4 -DNP then aq. KOH (2) aq. KOH then 2, 4-DNP
(3) NaHSO₃ (4) Lucas reagent

CP0144

9. Sodium nitroprusside Na₂[Fe(CN)₅NO] is used as reagent for detection of and the compound formed is

- (1) Sulphur Na₄[Fe(CN)₅NOS] (2) Nitrogen, Na₄[Fe(CN)₆]
(3) Sulphur Na₂[Fe(CN)]NOSI (4) Sulphur Na₂[Fe(CN)₅NOS]

CP0145

10. The prussian blue colouration obtained in the test for nitrogen in the organic compound is

- (1) K₄[Fe(CN)]₆ (2) Fe₄[Fe(CN)₆]₃ (3) Fe[Fe(CN)₆] (4) Fe₃[Fe(CN)₆]₂

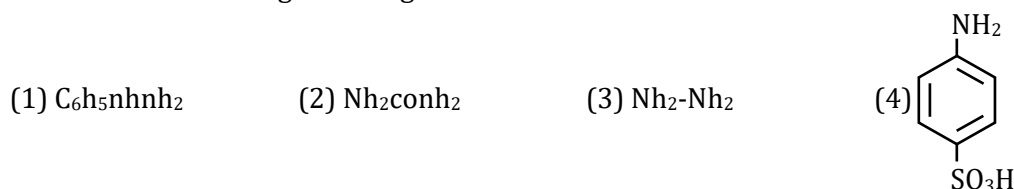
CP0146

11. If N and S both are present in an organic compound during Lassaigne's test, both will change into

- (1) Na₂S and NaCN (2) NaSCN
(3) Na₂SO₃ and NaCN (4) Na₂S and NaCNO

CP0147

12. Which of the following will not give test for 'N' in sodium extract?



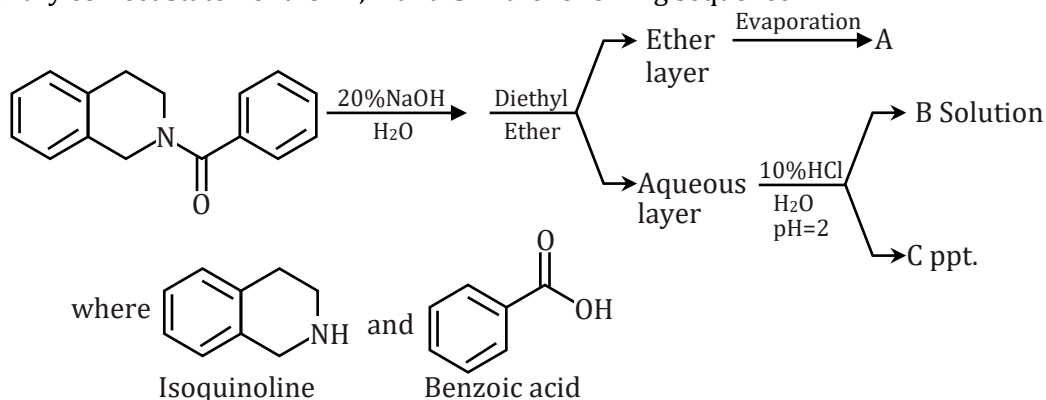
CP0148

13. Anthracene can be purified by

- (1) Distillation (2) Sublimation
(3) Filtration (4) Fractional distillation

CP0149

14. Silver salt method is used to determine molecular weight of
 (1) organic acids (2) organic bases
 (3) both acids and bases (4) none of these **CP0150**
15. Which of the following observations is correct and is used in the identification of carboxylic acids?
 (1) Carboxylic acids liberate CO_2 gas from NaHCO_3 solution.
 (2) They produce fruity smell of esters when heated with alcohol in presence of Conc. H_2SO_4 .
 (3) Both (A) and (B)
 (4) Iodoform test **CP0151**
16. An organic compound is heated with HNO_2 at 0°C and then the resulting solution is added to a solution of β -naphthol whereby a brilliant red dye is produced. The observations indicate that the compound possesses
 (1) $-\text{NO}_2$ group (2) $-\text{CONH}_2$ group (3) aromatic NH_2 group (4) aliphatic NH_2 group **CP0152**
17. An organic compound contains C, H, N, S and Cl. For the detection of chlorine, the sodium extract of the compound is first heated with a few drops of concentrated HNO_3 and then AgNO_3 is added to get a white ppt. of AgCl . The digestion with HNO_3 before the addition of AgNO_3 is
 (1) to prevent the formation of NO_2
 (2) to create a common ion effect
 (3) to convert CN^- and S^{2-} to volatile HCN and H_2S , or else they will interfere with the test forming AgCN or Ag_2S
 (4) to prevent the hydrolysis of NaCN and Na_2S **CP0153**
18. Rectified spirit contains
 (1) 95.6 per cent ethanol and 4.4 per cent methanol
 (2) 100 per cent ethanol
 (3) 95.6 per cent ethanol and 4.4 per cent water
 (4) 95.6 per cent ethanol and 4.4 per cent benzene **CP0154**
19. Aniline can be separated from phenol using
 (1) NaHCO_3 (2) $\text{NaNO}_2 + \text{HCl}$ at 0°C
 (3) NaCl (4) Acidified KMnO_4 **CP0155**
20. Identify correct statement for A, B and C in the following sequence.

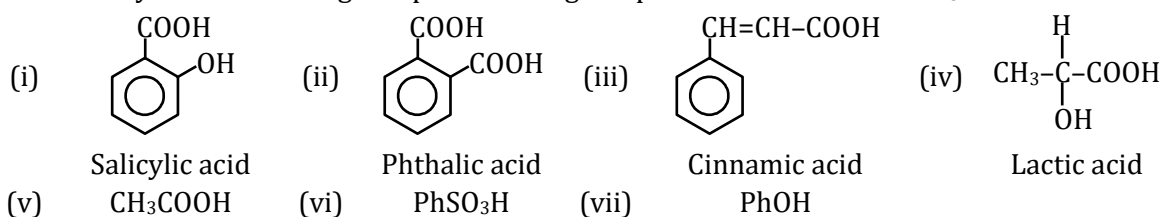


- (1) A = benzoic acid, B = sodium chloride and C = isoquinoline
 (2) A = isoquinoline, B = benzoic acid and C = sodium chloride
 (3) A = isoquinoline, B = sodium chloride and C = benzoic acid
 (4) A = sodium chloride, B = isoquinoline and C = benzoic acid **CP0156**

SECTION-B

- This section will have **TEN questions**. Candidate can choose to attempt any 5 questions out of these 10 questions. In case if candidate attempts more than 5 questions, first 5 attempted questions will be considered for marking.
- The answer to each question is a **NUMERICAL VALUE**.
- For each question, enter the correct numerical value (Answer should be rounded off to the nearest integer).
- Answer to each question will be evaluated according to the following marking scheme:
 Full Marks : +4, if only correct answer is given.
 Zero Marks : 0, if no answer is given.
 Negative Marks : -1 for incorrect answer

1. How many of the following compounds will give positive test with NaHCO_3 ?



CP0024

2. An aromatic organic compound $\text{C}_x\text{H}_y\text{O}$ (where $X = 8, Y = ?$) gives positive test with neutral FeCl_3 and also gives white precipitate with Tollen's reagent. Find the value of 'Y'.

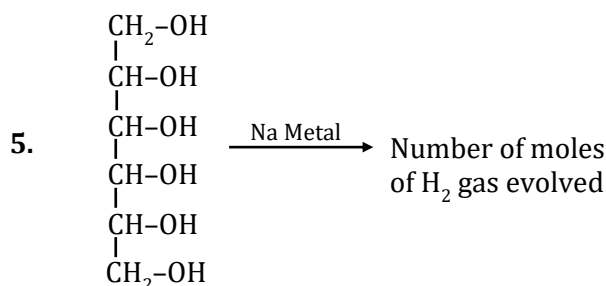
CP0025

3. Calculate total number of structural isomeric alkynes having molecular formula C_6H_{10} Which gives Tollen's test.

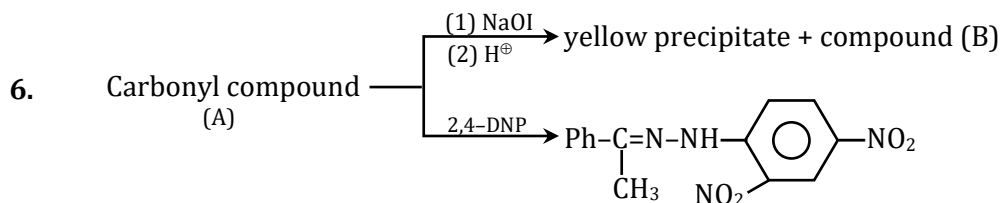
CP0026

4. Compound (A) $\xrightarrow[(2) \beta\text{-Naphthol}]{(1) \text{NaNO}_2 + \text{HCl}}$ (B) orange red azo dye
 What would be the minimum molecular mass of compound A?

CP0027



CP0028



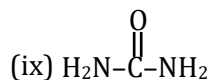
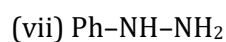
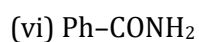
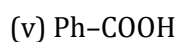
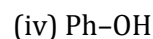
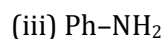
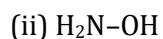
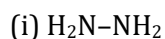
Find the mass percentage of oxygen in compound (B).

CP0029

7. How many cyclic structural isomeric alcohols having molecular formula $\text{C}_4\text{H}_8\text{O}$ liberate, H_2 gas on reaction with Na metal?

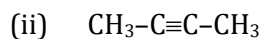
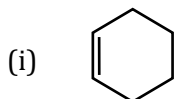
CP0030

8. How many of the following compounds give prussian blue colour when their sodium extract is treated with FeSO_4 followed by FeCl_3 solution?



CP0053

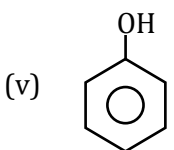
9. Number of compounds which decolourise brown colour of Br_2 Sol.



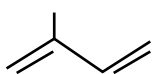
(iii)



(iv)



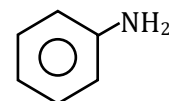
(vi)



(vii)

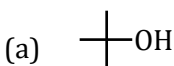


(viii)

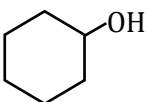


CP0054

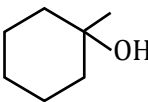
10. How many of the following will produce immediate turbidity with Lucas reagent ?



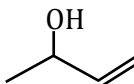
(b)



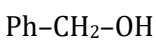
(c)



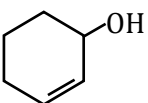
(d)



(f)



(g)



CP0056

JEE (Advanced) Practice Paper

This paper is for yourself practice and assessment the discussion of this paper is optional though you can see PDF solutions or video solutions or solutions in hardcopy whichever is provided.

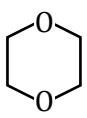
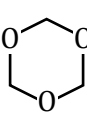
SECTION-I

- This section contains **SIX** questions.
- Each question has FOUR options (A), (B), (C) and (D). ONLY ONE of these four options is correct.
- For each question, darken the bubble corresponding to the correct option in the ORS.
- For each question, marks will be awarded in one of the following categories:

Full Marks : +3, if only the bubble corresponding to the correct option is darkened.

Zero Marks : 0, if none of the bubbles is darkened.

Negative Marks : -1, in all other cases

1.  and  ; Compounds (X) and (Y) can be differentiated by :

(A) H_3O^+ , NaOI

(B) H_3O^+ , then Fehling test

(C) H_3O^+ , then Na

(D) Both (b) and (c)

CP0157

2. Compound $\text{CH}_3 - \text{CH} \begin{matrix} \text{OEt} \\ \text{OEt} \end{matrix}$ and $\text{CH}_3 - \text{CH}_2 - \text{O} - \text{CH}_2 - \text{CH}_3$ can be differentiated by:
- (P) (Acetal) (Q)**

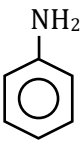
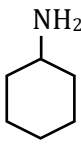
(A) H_3O^+ , Na

(B) H_3O^+ , Tollens' test

(C) H_3O^+ , Fehling test

(D) All of these

CP0158

3.  and  can be differentiated by :
- (aniline) (cyclohexyl amine)

(A) Hinsberg test

(B) Iso-cyanide test

(C) NaNO_2 , HCl, then β -Naphthol

(D) NaOH

CP0159

4. Give test to differentiate (Bromobenzene) Ph-Br and benzyl bromide (PhCH_2Br).
- (A) (i) aq. KOH (ii) Na (B) AgNO_3
- (C) KMnO_4 (D) All these

CP0160

5. Lassaigne's test for the detection of nitrogen will fail in the case of :
- (A) NH_2CONH_2 (B) $\text{NH}_2\text{CONHNH}_2 \cdot \text{HCl}$
- (C) $\text{NH}_2\text{NH}_2 \cdot \text{HCl}$ (D) $\text{C}_6\text{H}_5\text{NHNH}_2 \cdot 2\text{HCl}$

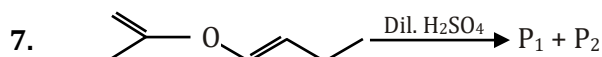
CP0161

6. Sodium nitroprusside when added to an alkaline solution of sulphide ions produces a colouration which is :
- (A) red (B) violet
- (C) brown (D) orange

CP0162

SECTION-II

- This section contains **FOUR** questions.
- Each question has matching lists. The codes for the lists have choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct
- For each question, marks will be awarded in one of the following categories :
 Full Marks : +3, if only the bubble corresponding to the correct option is darkened.
 Zero Marks : 0, if none of the bubbles is darkened.
 Negative Marks : -1, in all other cases.

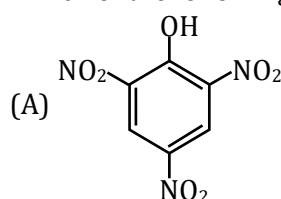


P_1 and P_2 products are identify by

- (A) Tollen's reagent (B) Iodoform test (C) $Br_2 + H_2O$ test (D) 1% alkaline $KMnO_4$

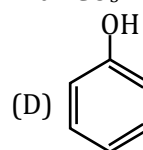
CP0163

8. Which of the following compound can liberate CO_2 when treated with $NaHCO_3$?



(B) CH_3CO_2H

(C) HCO_2H



CP0164

9. In Lassaigne's test, the organic compound is first fused with sodium metal. The sodium metal is used because

- (A) The melting point of sodium metal is low.
 (B) Sodium metal reacts with elements present in organic compounds to form inorganic compounds.
 (C) All sodium salts are soluble in water.
 (D) All sodium salts are not soluble in water.

CP0165

10. Ethanol and ethanal are distinguished by

- (A) Fehling's solution test (B) Tollen's reagent test
 (C) Iodoform test (D) Ceric ammonium nitrate

CP0166

SECTION-III

- This section contains **ONE** paragraph.
- Based on each paragraph, there are **FIVE** questions.
- Each question has **FOUR** options (A), (B), (C) and (D) **ONLY ONE** of these four options is correct.
- For each question, darken the bubble corresponding to the correct option in the ORS.
- For each question, marks will be awarded in one of the following categories :
 Full Marks : +3, if only the bubble corresponding to the correct answer is darkened.
 Zero Marks : 0, in all other cases.

Paragraph for Q. 11 to 15

Test (Q). A compound X was fused with Na metal and the extract gave a white precipitate with $AgNO_3$. The Lassaigne's extract gave a red colouration with neutral $FeCl_3$.

Test (R). While compound Y when fused with Na metal and subsequent analysis on its Lassaigne's extract did not give any characteristic test.

Test (S). While compound Y on fusion with fusion mixture (sodium carbonate + potassium nitrate) or Na_2O_2 , followed by extraction, followed by addition of Conc. HNO_3 . and ammonium molybdate gave a yellow precipitate.

11. Compound X contains

- (A) N (B) S (C) N+S (D) P

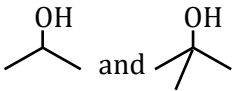
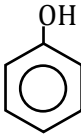
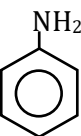
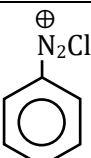
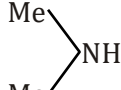
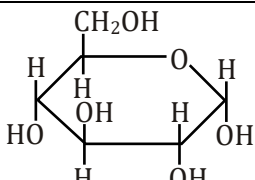
CP0167

12. Compound X
 (A) Will contain halogens (B) may contain halogens
 (C) may contain only sulphur (D) will contain only nitrogen CP0168
13. Compound Y contain
 (A) N (B) S (C) X (D) P CP0169
14. The chemical reaction taking place in Y, when it is fused with fusion mixture is
 (A) $3\text{Na} + \text{P} + 4\text{O} \rightarrow \text{Na}_3\text{PO}_4$ (B) $3\text{Na}_2\text{CO}_3 + 2\text{P} + [\text{O}] \rightarrow 2\text{Na}_3\text{PO}_4 + 3\text{CO}_2$
 (C) $3\text{KNO}_3 + \text{P} + 3\text{O} \rightarrow \text{K}_3\text{PO}_4 + 3\text{NO}_2 + \text{O}_2$ (D) None of these CP0170
15. The formula of yellow precipitate is
 (A) $(\text{NH}_4)_3\text{PO}_4$ (B) $\text{Mo}(\text{PO}_4)$
 (C) $(\text{NH}_4)_3\text{PO}_4 \cdot 12\text{Mo}_3\text{P}_3$ (D) $\text{Mo}(\text{PO}_4)_2$ CP0171

SECTION-IV

- This section contains **TWO** questions.
- Each question has matching lists.** The codes for the lists have choices (A), (B), (C) and (D) out of which **ONLY ONE is correct**
- For each question, marks will be awarded in one of the following categories :
 Full Marks : +3, if only the bubble corresponding to the correct option is darkened.
 Zero Marks : 0, if none of the bubbles is darkened.
 Negative Marks : -1 in all other cases.

16. Match the Column-I and Column-II

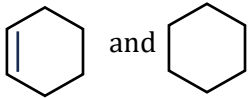
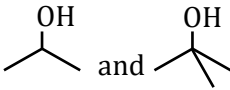
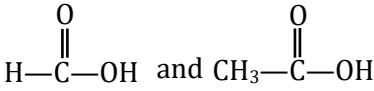
	Column I (pair of compounds)		Column II (test to distinguish)
(a)	 and 	(p)	Libermann nitroso test
(b)	 and 	(q)	 (Dye test)
(c)	 and 	(r)	Iodoform
(d)	 and 	(s)	Lucas
		(t)	NaHSO_3

- (A) (a→rs), (b→pq), (c→p), (d→rt)
 (C) (a→rs), (b→pq), (c→q), (d→pq)

- (B) (a→s), (b→pq), (c→r), (d→rt)
 (D) (a→pq), (b→r), (c→p), (d→qr)

CP0172

17. Match the Column-I and Column-II

	Column-I (Pair of compounds)		Column-II (Identification test)
a		p	Tollen's reagent test
b		q	Br ₂ + H ₂ O test
c		r	Lucas test
d		s	Iodoform test
		t	Ammonical Cu ₂ Cl ₂ test

(A) (a→q), (b→rs), (c→p), (d→rs)

(B) (a→q), (b→rs), (c→p), (d→pt)

(C) (a→rs), (b→q), (c→r), (d→pt)

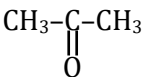
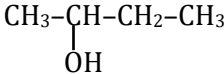
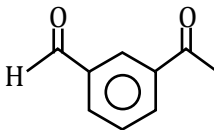
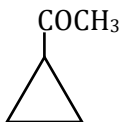
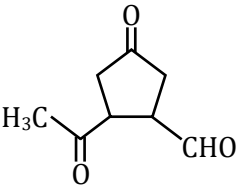
(D) (a→q), (b→rs), (c→t), (d→rs)

CP0173

SECTION-V

- This section contains **ONE** question.
- The answer to each question is a **NUMERICAL VALUE**.
- For each question, enter the correct numerical value (in decimal notation, truncated/rounded-off to the second decimal place; e.g. 6.25, 7.00, -0.33, -.30, 30.27, -127.30, if answer is 11.36777..... then both 11.36 and 11.37 will be correct).
- Answer to each question will be evaluated according to the following marking scheme:
 Full Marks : +3, if **ONLY** the correct numerical value is entered as answer.
 Zero Marks : 0, in all other cases.

18. How many compounds will give positive iodoform test but negative Tollen's test?

- (a) CH₃CHO (b)  (c)  (d) 
- (e)  (f)  (g) CH₃-CH₂-OH (h) CH₃-COOH
- (i) PhCOCH₃

CP0023

ANSWER KEY

EXERCISE - O

Que.	1	2	3	4	5	6	7	8	9	10
Ans.	A	D	D	B	C	D	B	D	C	B
Que.	11	12	13	14	15	16	17	18	19	20
Ans.	A	B	B	D	B	C	D	D	C	C
Que.	21	22	23	24	25	26	27	28	29	30
Ans.	A	C	B	C	B	D	A	C	C	B
Que.	31	32	33	34	35	36	37	38	39	
Ans.	ABCD	BCD	ABC	AB	BC	BC	AB	A	B	

EXERCISE - S

Que.	1	2	3	4	5	6	7	8	9	
Ans.	3	6	2	6	56	70	28	51.2	3	

EXERCISE - JEE (Main) PYQ

Que.	1	2	3	4	5	6	7	8	9	10
Ans.	3	1	22	42	2	6	200	2	3	44
Que.	11	12	13	14	15	16	17	18	19	20
Ans.	2	4	1	4	4	1	25	56	40	2
Que.	21									
Ans.	4									

EXERCISE - JEE (Advanced) PYQ

Que.	1	2								
Ans.	D	D								

JEE (Main) Practice Paper

Section-A	Q.	1	2	3	4	5	6	7	8	9	10
	A.	2	2	3	4	4	3	4	2	1	2
	Q.	11	12	13	14	15	16	17	18	19	20
	A.	2	3	2	1	3	3	3	3	2	2
Section-B	Q.	1	2	3	4	5	6	7	8	9	10
	A.	6	6	4	93	3	26.22	4	4	6	5

JEE (Advanced) Practice Paper

Section-I	Q.	1	2	3	4	5	6	
	A.	D	D	C	D	C	B	
Section-II	Q.	7	8	9	10			
	A.	AB	ABC	ABC	ABD			
Section-III	Q.	11	12	13	14	15		
	A.	C	B	D	BC	C		
Section-IV	Q.	16	17					
	A.	A	B					
Section-V	Q.	18						
	A.	5						