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A NOTE TO THE STUDENT

The Common University Entrance Test (CUET) for Undergraduate courses is highly competitive. Every year, thousands of students take the CUET UG Chemistry exam, making it tough to excel. The exam covers a broad range of topics, from Solid States to Chemistry in Everyday Life, so thorough preparation is essential.

ABOUT THE EBOOK

How well a candidate does in the CUET UG Chemistry exam depends a lot on how prepared they are. After the exam, it's a good idea for candidates to review their preparation thoroughly. This can help them estimate their potential scores and percentile rankings, giving them an advantage in selecting their preferred colleges based on their expected scores. In this ebook, candidates will find answer keys to all the questions, the chapters they belong to and their difficulty levels. The ebook, created by Chemistry experts, aims to provide candidates with a complete analysis of the CUET UG Chemistry exam to aid in their preparation.

ANSWER KEY AND EXAM ANALYSIS - Set D

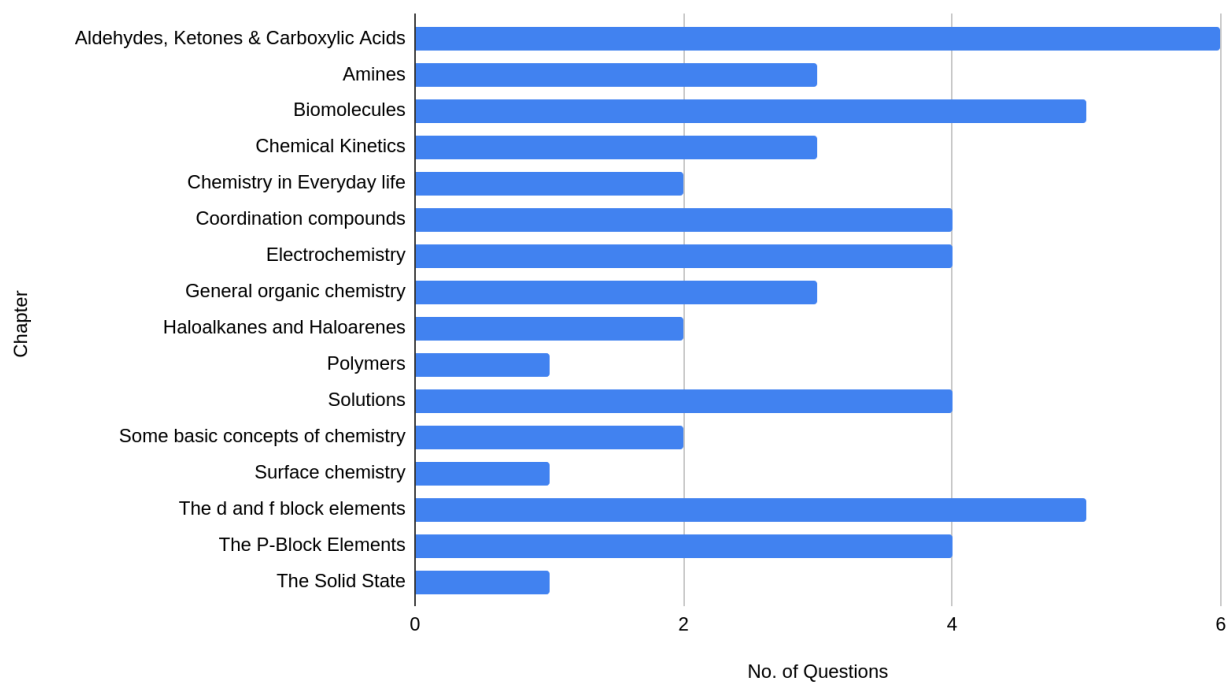
Q. No.	Answer Key	Chapter	Difficulty Level
1	1	Solutions	Medium
2	3	Biomolecules	Easy
3	4	Biomolecules	Medium
4	2	Solutions	Medium
5	3	Aldehydes, Ketones & Carboxylic Acids	Difficult
6	4	Amines	Medium
7	3	Aldehydes, Ketones & Carboxylic Acids	Difficult
8	2	Aldehydes, Ketones & Carboxylic Acids	Medium
9	1	Haloalkanes and Haloarenes	Easy
10	1	The d and f block elements	Easy
11	2	The d and f block elements	Easy
12	4	The d and f block elements	Medium
13	3	The d and f block elements	Medium
14	2	Some basic concepts of chemistry	Difficult
15	2	The Solid State	Medium
16	1	Solutions	Easy
17	1	Chemical Kinetics	Medium
18	4	Electrochemistry	Easy
19	4	Electrochemistry	Medium
20	4	Chemical Kinetics	Difficult
21	3	Surface chemistry	Difficult
22	4	The P-Block Elements	Easy
23	3	The P-Block Elements	Medium
24	2	Coordination compounds	Medium
25	2	Coordination compounds	Medium
26	1	The P-Block Elements	Medium

27	2	Biomolecules	Easy
28	4	Chemistry in Everyday life	Difficult
29	2	Haloalkanes and Haloarenes	Medium
30	1	Biomolecules	Easy
31	2	Some basic concepts of chemistry	Medium
32	4	Aldehydes, Ketones & Carboxylic Acids	Easy
33	1	Amines	Medium
34	2	Amines	Easy
35	3	Biomolecules	Easy
36	2	General organic chemistry	Medium
37	4	Polymers	Easy
38	2	Chemistry in Everyday life	Easy
39	2	Electrochemistry	Easy
40	3	Electrochemistry	Medium
41	4	General organic chemistry	Difficult
42	3	Coordination compounds	Medium
43	3	Solutions	Difficult
44	3	Chemical Kinetics	Medium
45	2	Aldehydes, Ketones & Carboxylic Acids	Easy
46	2	Aldehydes, Ketones & Carboxylic Acids	Medium
47	3	Coordination compounds	Medium
48	3	General organic chemistry	Medium
49	3	The d and f block elements	Difficult
50	1	The P-Block Elements	Medium

Chapter-Wise Analysis

Chapter	No. of Questions
Aldehydes, Ketones & Carboxylic Acids	6
Amines	3
Biomolecules	5
Chemical Kinetics	3
Chemistry in Everyday life	2
Coordination compounds	4
Electrochemistry	4
General organic chemistry	3
Haloalkanes and Haloarenes	2
Polymers	1
Solutions	4
Some basic concepts of chemistry	2
Surface chemistry	1
The d and f block elements	5
The P-Block Elements	4
The Solid State	1
Grand Total	50

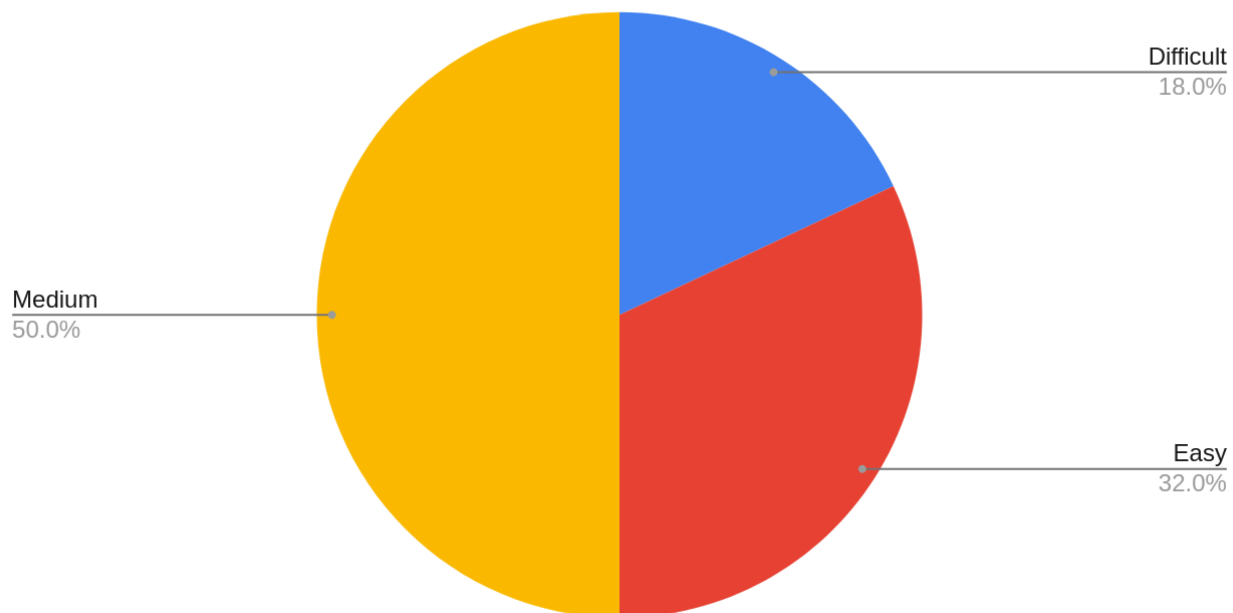
Chemistry - 29th May 2024: No. of Questions vs. Chapter



Difficulty Level

Difficulty Level	No. of Questions
Difficult	9
Easy	16
Medium	25
Grand Total	50

Chemistry - 29th May-2024: No. of Questions Vs Difficulty Level



QUESTION PAPER - SET D

306 E (New)/D

4. Which of the following solvents is having its lowest ebullioscopic constant?

Solvent	Boiling Point (K)
Chloroform	334.4
Diethyl Ether	307.8
Benzene	353.3
Carbon disulphide	319.4

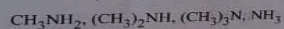
- (1) Chloroform
(2) Diethyl Ether
(3) Benzene
(4) Carbon disulphide

Read the following passage and answer the next five questions based on it.

Aldehydes are generally more reactive than ketones in nucleophilic addition reactions due to steric and electronic reasons. Sterically, the presence of two large groups in ketones hinders the attack of nucleophile to carbonyl carbon than in aldehydes. Electronically, aldehydes are more reactive than ketones because two alkyl groups reduce the electrophilicity of the carbonyl carbon more effectively than in the former.

5. Which among the following compound is formed, when aldehyde reacts with HCN in presence of base?
- (1) Cyanide
(2) Isocyanide
(3) Cyanohydrin
(4) Hydrogen cyanide

6. The correct decreasing order of basic strength of following amines in aqueous solution is :



- (1) $\text{CH}_3\text{NH}_2 > (\text{CH}_3)_2\text{NH} > \text{NH}_3 > (\text{CH}_3)_3\text{N}$
(2) $\text{CH}_3\text{NH}_2 > (\text{CH}_3)_2\text{NH} > (\text{CH}_3)_3\text{N} > \text{NH}_3$
(3) $\text{NH}_3 > (\text{CH}_3)_3\text{N} > (\text{CH}_3)_2\text{NH} > \text{CH}_3\text{NH}_2$
(4) $(\text{CH}_3)_2\text{NH} > \text{CH}_3\text{NH}_2 > (\text{CH}_3)_3\text{N} > \text{NH}_3$

SPACE FOR ROUGH WORK

$$\Delta T = \frac{1000 \times K_b}{M} \times \frac{C_{\text{sol}}}{1000}$$

$$M = \frac{1000 \times K_b \times C_{\text{sol}}}{\Delta T}$$

313

306 E (New)/D

(4)

7. A new C-C bond formation is possible in :

- (A) Cannizzaro reaction
 (B) Friedel-Crafts alkylation
 (C) Clemmensen reduction
 (D) Riemer-Tiemann reaction

Choose the correct answer from the options given below :

- (1) (B) and (D) only
 (2) (A), (B) and (D) only
 (3) (B), (C) and (D) only
 (4) (A), (B), (C) and (D)

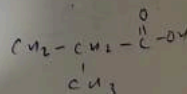
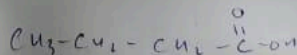
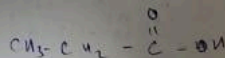
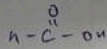
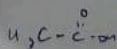
8. Which of the following will respond to Tollen's test ?

- (1) Ethanoic acid
 (2) Methanoic acid
 (3) Propanoic acid
 (4) Butanoic acid

9. The order of reactivity of the given haloalkanes towards nucleophile is

- (1) $RI > RBr > RCl$
 (2) $RCl > RBr > RI$
 (3) $RBr > RCl > RI$
 (4) $RBr > RI > RCl$

SPACE FOR ROUGH WORK



Read the following passage and answer the next five questions based on it.

The transition metals are very hard and have low volatility. Their melting and boiling points are high. In any row, the melting points of these metals rise to a maximum at d^5 and fall regularly as atomic number increases. The high melting points of these metals are attributed to the involvement of greater number of electrons from $(n-1)d$ in addition to ns electrons in the interatomic metallic bonding.

10. Which transition metal is liquid at room temperature?

- (1) Hg
(2) Cu
(3) Ag
(4) Au

11. Which is the hardest metal?

- (1) Zn
(2) Cu
(3) Hg
(4) Cd

12. In any row, melting points of these metals rise to a maximum at d^5 . Which transition metal is an exception?

- (1) Ti
(2) V
(3) Cr
(4) Mn

13. Which transition metal has the highest melting point?

- (1) Hf
(2) Ta
(3) W
(4) Re

14. How many electrons are needed in reduction of $Cr_2O_7^{2-}$ to Cr^{3+} ?

- (1) One
(2) Six
(3) Five
(4) Eight

SPACE FOR ROUGH WORK

15. Which among the following compounds show metal excess defect due to anionic vacancy ?
 (1) ZnO (2) NaCl
 (3) FeO (4) CdO
16. Molal elevation constant is also known as :
 (1) Ebullioscopic constant (2) Gas constant
 (3) Henry's constant (4) Cryoscopic constant
17. What is the overall order of the reaction ?
 $\text{Rate} = k[A]^{1/2}[B]^{3/2}$
 (1) 2 (2) 0
 (3) 1 (4) 0.5
18. Which term of molar conductivity is used when the concentration of electrolyte approaches to zero ?
 (1) Infinite molar conductivity
 (2) Zero molar conductivity
 (3) Standard molar conductivity
 (4) Limiting molar conductivity
19. Kohlrausch law is related to which of the following term ?
 (1) Osmosis (2) Diffusion
 (3) Effusion (4) Migration of ions
20. Which factor in Arrhenius equation, corresponds to fraction of molecules having kinetic energy greater than activation energy ?
 (1) $\ln k$ (2) $\ln A$
 (3) RT (4) $e^{-E_a/RT}$
21. What is the another term used for probability factor (P) in collision theory ?
 (1) Temperature factor (2) Compressibility factor
 (3) Steric factor (4) Concentration factor

SPACE FOR ROUGH WORK

$$R \rightarrow 1.5 + 0.5$$

$$= 2$$

$$e^{-E_a/RT}$$

306 E (New)/D

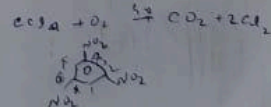
(7)

22. Why does Fluorine exhibit only -1 oxidation state ?
- (1) It is a halogen.
 - (2) It is a non-metal.
 - (3) It is small in size.
 - (4) It has no d orbitals.
23. Which among the following halogen exists in liquid state at room temperature ?
- (1) Fluorine
 - (2) Chlorine
 - (3) Bromine
 - (4) Iodine
24. The central atoms/ions in the coordination compounds are referred as _____
- (1) Lewis base
 - (2) Lewis acid
 - (3) Bronsted acid
 - (4) Bronsted base
25. What is the IUPAC name of $[\text{Pt}(\text{NH}_3)_2\text{Cl}(\text{NO}_2)]$?
- (1) Diamminechloridonitro-N-platinum(II)
 - (2) Diamminechloridenitro-N-platinum(III)
 - (3) Diamminechloridonitro-O-platinum(II)
 - (4) Diammonia chloridonitro-N-platinum(II)
26. What product is obtained when chloroform reacts with oxygen in presence of light ?
- (1) Phosgene gas
 - (2) Phosphine gas
 - (3) Chlorine gas
 - (4) Hydrogen gas
27. Which among the following is a trihydric alcohol ?
- (1) Ethanol
 - (2) Glycerol
 - (3) Ethylene Glycol
 - (4) Phenol
28. Aspirin is also known as :
- (1) Salicylic acid
 - (2) Ethyl Salicylic acid
 - (3) Methyl Salicylic acid
 - (4) Acetyl Salicylic acid
29. What is the IUPAC name of picric acid ?
- (1) 2-Nitrophenol
 - (2) 2,4,6-Trinitrophenol
 - (3) Ethyl Salicylic acid
 - (4) 2 aminophenol

SPACE FOR ROUGH WORK

8. 1. 7. 2. 6. 5.

1. 7. 2. 6. 5.



30. What is the product when glucose reacts with bromine water ?

- (1) Gluconic acid (2) Glyceraldehyde
(3) Saccharic acid (4) Oxime

31. Match List I with List II for the oxidation state of central atoms :

List-I	List-II
(A) $\text{Cr}_2\text{O}_7^{2-}$	(I) +3
(B) MnO_4^-	(II) +5
(C) VO_3^-	(III) +7
(D) FeF_6^{3-}	(IV) +6

Choose the correct answer from the options given below :

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

32. What is the colour of copper compound formed in Fehling's test for aliphatic aldehydes ?

- (1) Green (2) Blue
(3) Yellow (4) Red brown

33. What is the major product formed when diazonium salt undergoes Gatterman reaction ?

- (1) Haloarene (2) Aryl amine
(3) Phenol (4) Diphenyl ether

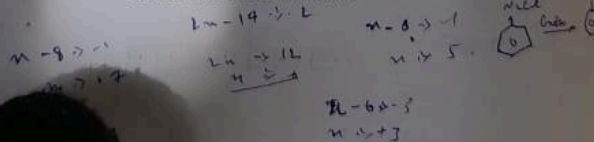
34. What is the major product of Carbylamine reaction ?

- (1) Cyanide (2) Isocyanide
(3) Nitrile (4) Alkane

35. Which among the following is an essential amino acid ?

- (1) Glycine (2) Alanine
(3) Valine (4) Serine

SPACE FOR ROUGH WORK



36. Arrange the following in increasing order of their pH values :

- (A) p-Nitrophenol (B) m-Cresol
(C) m-Nitrophenol (D) Phenol

Choose the correct answer from the options given below :

- (1) $(A) < (B) < (C) < (D)$ (2) $(A) < (C) < (D) < (B)$
(3) $(B) < (A) < (D) < (C)$ (4) $(C) < (B) < (D) < (A)$

37. Which among the following is a biodegradable polymer ?

- (1) PVC (2) Freon
(3) Nylon (4) PHBV

38. Which among the following is an antacid ?

- (1) Aspirin (2) Zantac
(3) Equanil (4) Noradrenaline

39. What is the numerical value of one Faraday in Coulombs ?

- (1) 96587 (2) 96487
(3) 99500 (4) 6.023

40. A first order reaction has a half-life of 693 sec. What will be its rate constant ?

- (1) 0.01 sec^{-1} (2) 1 sec^{-1}
(3) 0.001 sec^{-1} (4) 0.1 sec^{-1}

41. For S_N2 reaction, the increasing order of the reactivity of the following alkyl halides is :

- (A) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{Br}$ (B) $\text{CH}_3\text{CH}_2\text{CH}(\text{Br})\text{CH}_3$
(C) $(\text{CH}_3)_3\text{CBr}$ (D) $(\text{CH}_3)_2\text{CHCH}_2\text{Br}$

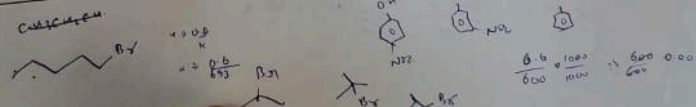
Choose the correct answer from the options given below :

- (1) $(A) < (B) < (C) < (D)$ (2) $(A) < (C) < (B) < (D)$
(3) $(B) < (A) < (D) < (C)$ (4) $(C) < (B) < (D) < (A)$

42. Which among the following is a strong field ligand ?

- (1) I^- (2) Cl^-
(3) NH_3 (4) SCN^-

SPACE FOR ROUGH WORK



43. Arrange the following in increasing order of their osmotic pressure generation at 298 K :

(The cell wall is permeable to water and not to the solute molecules)

- (A) If a cell containing 0.5 moles of solute dissolved in 1 L of water is immersed in pure water.
 (B) If a cell containing 0.25 moles of solute dissolved in 1 L of water is immersed in pure water.
 (C) If a cell containing 0.1 moles of solute dissolved in 0.01 L of water is immersed in pure water.
 (D) If a cell containing 0.2 moles of solute dissolved in 0.05 L of water is immersed in pure water.

Choose the correct answer from the options given below :

- (1) (C) < (B) < (A) < (D) (2) (D) < (A) < (B) < (C)
 (3) (B) < (A) < (D) < (C) (4) (C) < (A) < (B) < (D)

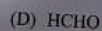
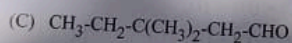
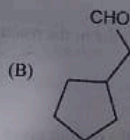
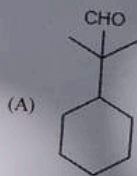
44. Arrange the following rate constant units in increasing order of their order of reaction :

- (A) sec^{-1} (B) $\text{mol L}^{-1} \text{sec}^{-1}$
 (C) $\text{mol}^{-1} \text{L sec}^{-1}$ (D) $\text{mol}^{-2} \text{L}^2 \text{sec}^{-1}$

Choose the correct answer from the options given below :

- (1) (C) < (A) < (B) < (D) (2) (C) < (B) < (A) < (D)
 (3) (B) < (A) < (C) < (D) (4) (A) < (B) < (C) < (D)

45. Which of the following compounds will undergo Aldol condensation reaction ?



Choose the correct answer from the options given below :

- (1) (A), (C) and (D) only (2) (B) and (C) only
 (3) (B), (C) and (D) only (4) (A), (B), (C) and (D)

SPACE FOR ROUGH WORK

Handwritten calculations for rough work:

$$\frac{0.5}{1} \times \frac{100}{10} = 50$$

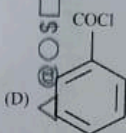
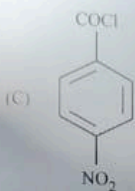
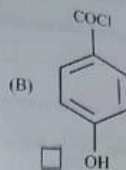
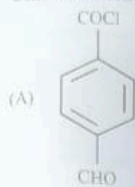
$$\frac{0.25}{1} \times \frac{100}{10} = 25$$

$$\frac{0.1}{0.01} \times \frac{100}{10} = 1000$$

$$\frac{0.2}{0.05} \times \frac{100}{10} = 400$$

46. Consider the following compounds :

(11.)



Arrange these compounds in the increasing order of rate of hydrolysis :

- (1) (B) < (D) < (C) < (A)
- (2) (B) < (D) < (A) < (C)
- (3) (D) < (B) < (A) < (C)
- (4) (A) < (D) < (B) < (C)

47. Which of the following ions will be coloured in the aqueous solution ?

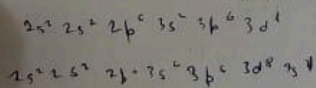
- (A) Ti^{3+}
(C) Cu^{+}

- (B) Nb^{3+}
(D) Y^{3+}

Choose the correct answer from the options given below :

- (1) (C) and (D) only
- (2) (A), (B) and (D) only
- (3) (A) and (B) only
- (4) (A), (B), (C) and (D)

SPACE FOR ROUGH WORK



48. The correct statement/statements from the options given below is/are :

- (A) Diazonium salts of aromatic amines are less stable than diazonium salts of aliphatic amines.
 (B) Ethylamine is insoluble in water.
 (C) Gabriel phthalimide synthesis can be used to prepare primary amines.
 (D) Because of +R-effect of $-NH_2$ group, aniline will undergo Friedel-Crafts acylation reaction.

Choose the correct answer from the options given below :

- (1) (A) and (B) only
 (2) (A), (C) and (D) only
 (3) (A) and (C) only
 (4) (B), (C) and (D) only

49. Match List-I with List-II :

List-I	List-II
(A) Mn^{2+}	(I) Pyrolusite ore
(B) Spin only Magnetic Moment	(II) An alloy of 4f metal, iron and traces of S, C, Al and Ca
(C) MnO_2	(III) $\mu_s = \sqrt{n(n+2)}$ BM
(D) Misch metal	(IV) Highest oxidation states

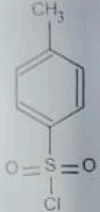
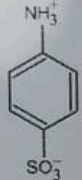
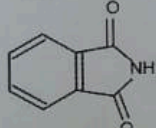
Choose the correct answer from the options given below :

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

SPACE FOR ROUGH WORK

$Mn \rightarrow +2$ $3d^5 4s^2$
 $Mn \rightarrow +4$ $3d^3 4s^1$

50. Match List-I with List-II :

List-I (Compound)	List-II (Property)
(A) COCl_2	(I) To distinguish between primary, secondary and tertiary amines
(B) 	(II) Poisonous gas
(C) 	(III) Synthesis of primary amines
(D) 	(IV) Zwitter ion

Choose the correct answer from the options given below :

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

SPACE FOR ROUGH WORK