



Sample Paper - 04

Dropper NEET (2024)

**CHEMISTRY**  
**ANSWER KEY**

1. (3)
2. (2)
3. (1)
4. (1)
5. (3)
6. (3)
7. (4)
8. (1)
9. (1)
10. (1)
11. (3)
12. (3)
13. (4)
14. (2)
15. (3)
16. (3)
17. (2)
18. (4)
19. (4)
20. (2)
21. (2)
22. (1)
23. (1)
24. (3)
25. (1)

26. (3)
27. (4)
28. (3)
29. (1)
30. (1)
31. (2)
32. (1)
33. (4)
34. (2)
35. (3)
36. (3)
37. (4)
38. (2)
39. (1)
40. (3)
41. (1)
42. (2)
43. (4)
44. (2)
45. (1)
46. (2)
47. (3)
48. (2)
49. (3)
50. (1)



## HINTS AND SOLUTION

1. (3)

For reversible process under isothermal conditions.

$$w = -2303nRT \log \left( \frac{p_1}{p_2} \right)$$

$$= -2.303 \times 2 \times 8.314 \times 300 \times \log \frac{1.01 \times 10^5}{5.05 \times 10^6}$$

$$= 1.95 \times 10^4 \text{ J}$$

2. (2)

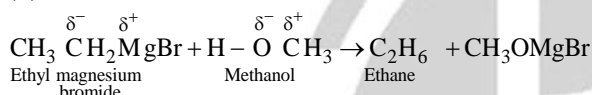
$$r = \frac{n^2}{Z} \times 0.529 \text{ \AA}$$

$$r_{\text{H}} : r_{\text{He}^+} : r_{\text{Li}^{2+}}$$

$$1 : \frac{1}{2} : \frac{1}{3}$$

$$6 : 3 : 2$$

3. (1)



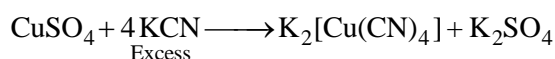
4. (1)

As steric hindrance increases, reactivity decreases, i.e., I > III > II > IV i.e., option (1) is correct.

5. (3)

Molecules	Total number of valence electrons	Magnetic behaviour
Cl <sub>2</sub> O <sub>7</sub>	7 × 2 + 7 × 6 = 14 + 42 = 56	Diamagnetic
Cl <sub>2</sub> O	7 × 2 + 6 = 20	Diamagnetic
ClO <sub>2</sub>	7 × 1 + 6 × 2 = 19	Paramagnetic
Cl <sub>2</sub> O <sub>5</sub>	7 × 2 + 6 × 5 = 44	Diamagnetic

6. (3)

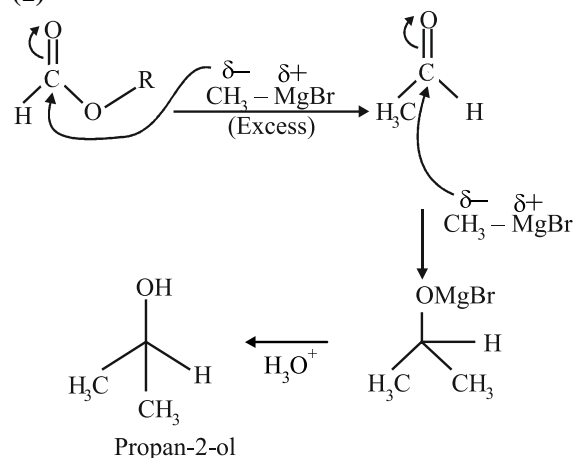


[Cu(CN)<sub>4</sub>]<sup>2-</sup> is stable complex having k = 2 × 10<sup>27</sup>. It does not provide Cu<sup>2+</sup> ion to give precipitate of CuS.

7. (4)

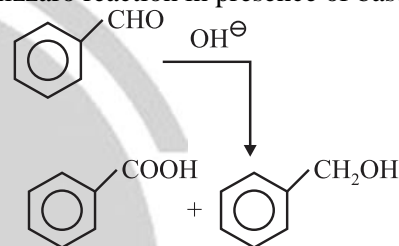
For a compound to be isomer it should have same molecular formula. Here all are structural isomer to each other.

8. (1)



9. (1)

Aldehydes having no α-hydrogen undergoes Cannizzaro reaction in presence of base as follows:

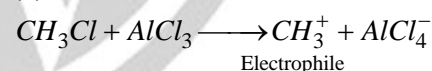


Here, self-oxidation as well as reduction takes place.

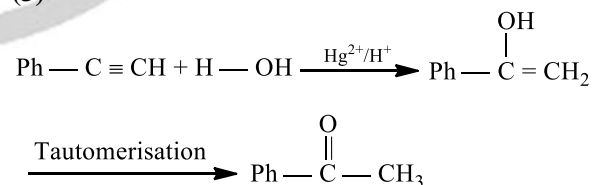
10. (1)

Each d-block series contains ten elements as the maximum capacity of d-orbitals is of 10 electrons.

11. (3)

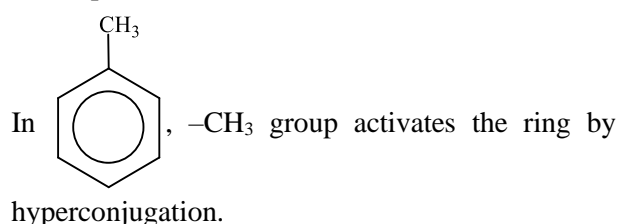


12. (3)

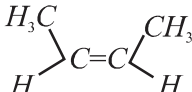
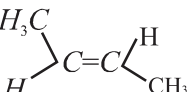


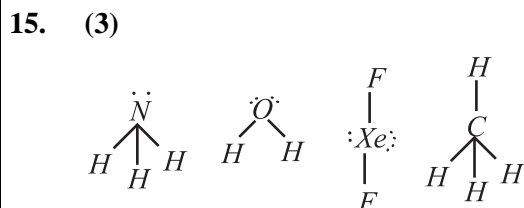
13. (4)

Activated benzene rings give faster reaction with electrophiles.





14. (2)  
 $C_2H_5CHO; CH_3COCH_3$  (A pair of functional isomers)  
 ;   
 (A pair of geometrical isomers)  
 $CH_3OC_3H_7$  ;  $C_2H_5OC_2H_5$  (A pair of metamers)  
 $H_2C = CHOH$  ;  $CH_3CHO$  (A pair of tautomers)



16. (3)  
 In HCN, the oxidation state of N is  $-3$ .  
 In  $HN_3$ , the oxidation state of N is  $-\frac{1}{3}$ .  
 In NO, the oxidation state of N is  $+2$ .

17. (2)  
 Photoelectric effect is easily pronounced by the metals having low ionization energy.

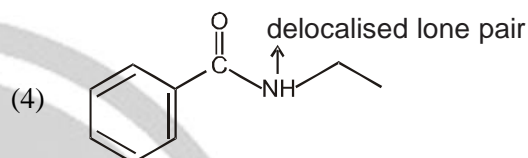
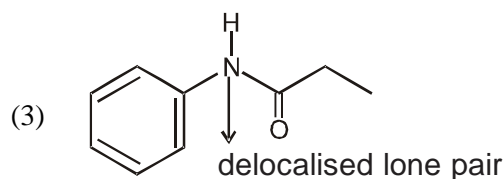
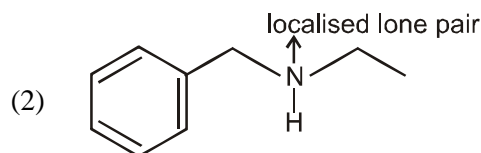
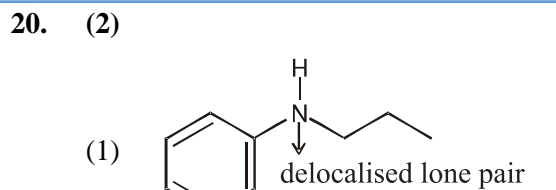
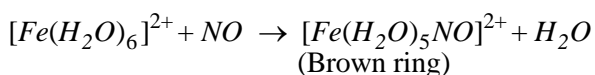
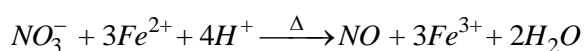
18. (4)  
 $CaCO_3(s) \xrightarrow{\Delta} CaO(s) + CO_2(g)$   
 (100 g) (56 g)  
 $\therefore 100 \text{ g } CaCO_3 \text{ gives } CaO = 56 \text{ g}$   
 $\therefore 20 \text{ g } CaCO_3 \text{ will give } CaO$   
 $= \frac{56}{100} \times 20 = 11.2 \text{ g}$

Thus,

$$\text{Percentage purity} = \frac{\text{Mass obtained}}{\text{Mass calculated}} \times 100$$

$$= \frac{8.4}{11.2} \times 100 = 75\%$$

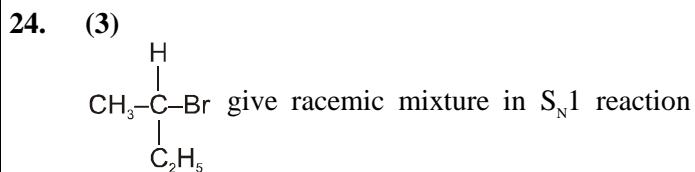
19. (4)  
 The presence of  $NO_3^-$  ion, in laboratory, is confirmed by brown ring test.



21. (2)  
 Terminal alkynes can react with ammoniacal  $AgNO_3$ .

22. (1)  
 In octahedral complexes, the three d-orbitals ( $d_{xy}$ ,  $d_{yz}$ ,  $d_{zx}$ ) experience less repulsion from the ligands while two d-orbitals ( $d_{x^2-y^2}$ ,  $d_{z^2}$ ) experience more repulsion from the ligands due to their shapes.

23. (1)
- Valence shell electron configuration of  $Ti^{4+}$  is  $3d^0 4s^0$ . As there is no unpaired electron for d-d transition, the solution of ions will be colourless.
  - Valence shell electron configuration of  $Cu^+$  is  $3d^{10} 4s^0$ . As all electrons are paired, there is no d-d transition, so the solution of ions will be colourless.
  - Valence shell electron configuration of  $Co^{3+}$  is  $3d^6 4s^0$ . As there are 4 unpaired electrons, there is d-d transition of electron, so the solution of ions will be coloured.
  - Valence shell electron configuration of  $Fe^{2+}$  is  $3d^6 4s^0$ . As there are 4 unpaired electrons, there is d-d transition of electron, so the solution of ions will be coloured.



because it has a chiral carbon.

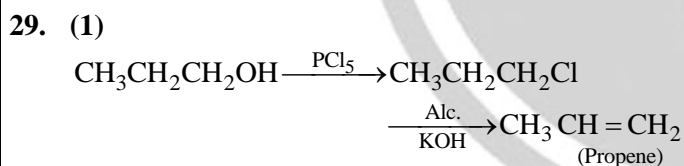
25. (1)  
Both statements are correct.

26. (3)  
[CoCl<sub>2</sub>(en)<sub>2</sub>]Cl, one mole complex contains, one mole of ionisable Cl<sup>-</sup> ions.  
One mole of complex = one mole of Cl<sup>-</sup> ions.  
∴ One mole of AgCl = One mole of complex  
=  $\frac{100 \times 0.024}{1000} = 0.0024$

27. (4)  
Glucose shows mutarotation, sucrose gives glucose and fructose on hydrolysis.

28. (3)

$$\begin{aligned} \Delta H_{\text{reaction}} &= \Delta H_{\text{f}}^{\circ}(\text{C}_6\text{H}_6) - 3\Delta H_{\text{f}}^{\circ}(\text{C}_2\text{H}_2) \\ &= 85 - 3(230) \\ &= -605 \text{ kJ mol}^{-1} \end{aligned}$$



30. (1)
- Mass of iron = 40 g
  - Mass of 1.2 atoms of N =  $14 \times 1.2 = 16.8$  g
  - Mass of  $1 \times 10^{23}$  atoms of C =  $(12 \times 1 \times 10^{23}) / (6.023 \times 10^{23}) = 1.99$  g
  - Mass of 1.12 liter of O<sub>2</sub> at STP =  $(32 \times 1.2) / 22.4 = 1.6$  g

31. (2)

$$t_{1/2} \propto \frac{1}{a^{n-1}}; \text{ where, } a = \text{initial conc.}, n = \text{order}$$

$$t_{1/2} (\text{second order}) \propto \frac{1}{a}$$

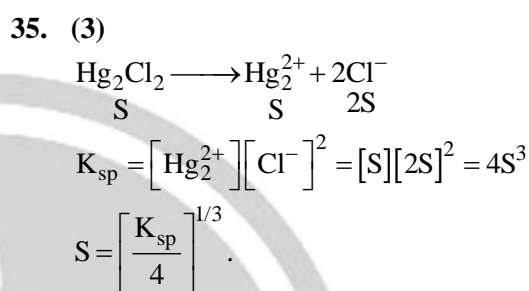
32. (1)  
Reason is the correct explanation for assertion.

33. (4)  
Due to inert pair effect +2 oxidation state of lead is more stable than +4 oxidation state.

34. (2)

$$k = C \times \frac{1}{A}$$

$$\frac{1}{A} = k \times \frac{1}{C} = k \times R = 0.0212 \times 55 = 1.166 \text{ cm}^{-1}$$



36. (3)  
Write the electronic configuration on the basis of aufbau principle.  
 $1s^2, 2s^2 2p^6, 3s^2 3p^6 3d^{10}, 4s^2 4p^5$   
The last electron is accommodated in p-energy shell.

37. (4)  
Ionic radii decreases when we move from La<sup>3+</sup> to Lu<sup>3+</sup>.

38. (2)  
The pH range of phenolphthalein is 8.2-10.

39. (1)  
Priority of ketone group is more than alkene

40. (3)  
Alkane level reduction is possible with Clemmensen reagent.

41. (1)  
m-CPBA converts ketone into ester and base hydrolysis of an ester gives phenol and an acid.



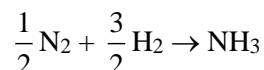
42. (2)

Absence of plane, center and improper axis of symmetry.

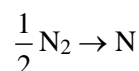
43. (4)

The more is the number of hyperconjugation structures, the more is the stability.

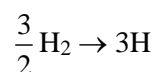
44. (2)



$$\Delta_f H^\circ = -45 \text{ kJ mol}^{-1}$$



$$\begin{aligned} \text{Bond dissociation enthalpy of N}_2 &= \frac{941.8}{2} \\ &= 470.9 \text{ kJ mol}^{-1} \end{aligned}$$



$$\text{Bond dissociation enthalpy of H-H} = \frac{3}{2} (436)$$

$$= 654 \text{ kJ mol}^{-1}$$

Total enthalpy of atomization

$$= 470.9 + 654 - (-46)$$

$$= 1170.9 \text{ kJ mol}^{-1}$$

45. (1)

Apply CIP sequence rule.

46. (2)

Calculate the total electron pairs, bonding electron pairs and lone pairs around central atoms.

47. (3)

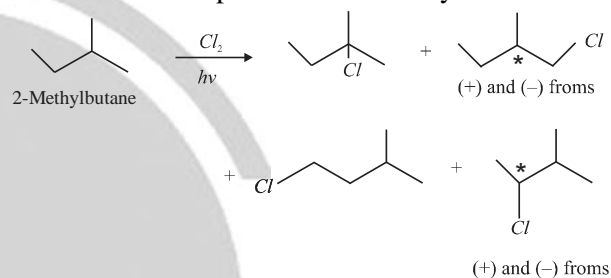
$$K_c = \frac{K_p}{(RT)^{\Delta n_g}}$$

$$\Delta n_g = 3 - 2 = 1 \text{ (from the reaction)}$$

$$K_c = \frac{1.8 \times 10^{-2}}{0.0821 \times 500} = 4.38 \times 10^{-4} \text{ M}$$

48. (2)

The number of monohalogenation products obtained from any alkane depends upon the number of different types of hydrogen it contains. The possible monochlorinated products of 2-methyl butane are :



49. (3)

Schmidt reaction.

50. (1)

Maximum  $\text{pK}_a$  means weakest acid as its conjugate base is the unstable one.

