

QUANTUM⁺ Plus

NEET Test Series 2018 - 19

For +2 Students



PCB TEST - 8

Test Date: 3rd April, 2019

Time: _____

**Venue: KP INSTITUTE OF PHYSICS
S.C.O. 156, Sector 37-C, CHD**

Syllabus

PHYSICS	CHEMISTRY	BIOLOGY
Complete Syllabus		

by PMT MENTORS

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.....*for those in pursuit of Excellence*

READ INSTRUCTIONS CAREFULLY

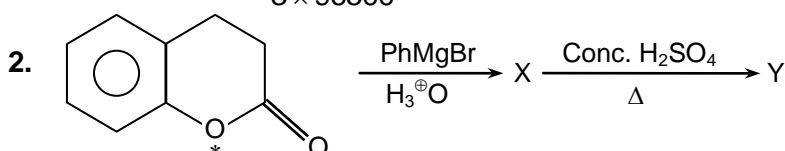
- The test is of **3 hour** duration.
- The maximum marks are **720**.
- This test consists of **180 questions. (Negative Marking)**
- For each question you will be **awarded 4 marks** if you have darkened only the bubble corresponding to the correct answer and **zero mark** if no bubbles are darkened. **Minus one (-1) mark** will be awarded for wrong answer

1. Al_2O_3 is reduced by electrolysis at low potentials and high currents. If 4.0×10^4 amperes of current is passed through molten Al_2O_3 for 6 hours, what mass of aluminium is produced? (Assume 100% current efficiency. At mass of Al = 27 g mol^{-1})

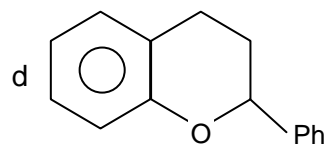
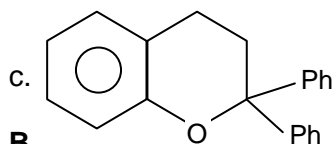
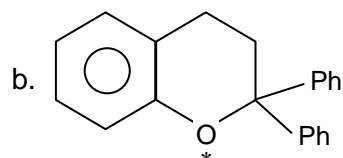
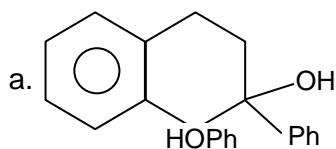
- a. $1.3 \times 10^4 \text{ g}$ b. $9.0 \times 10^3 \text{ g}$ c. $8.05 \times 10^4 \text{ g}$ d. $2.4 \times 10^5 \text{ g}$

C

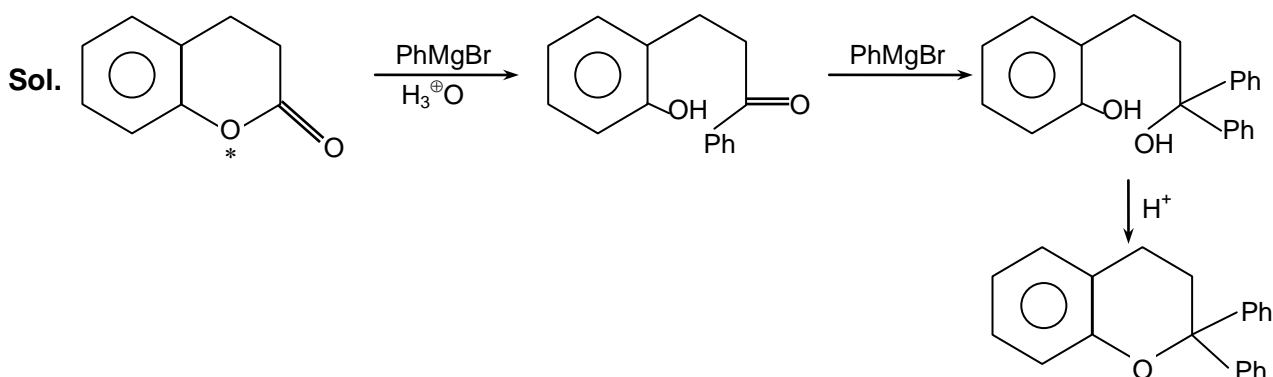
Sol. Mass = $\frac{4 \times 10^4 \times 6 \times 60 \times 60 \times 27}{3 \times 96500} = 8 \times 10^4$



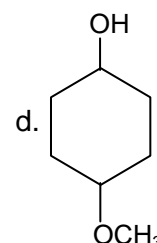
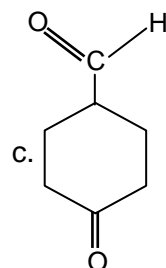
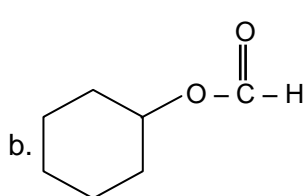
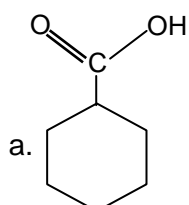
Identify 'Y' :



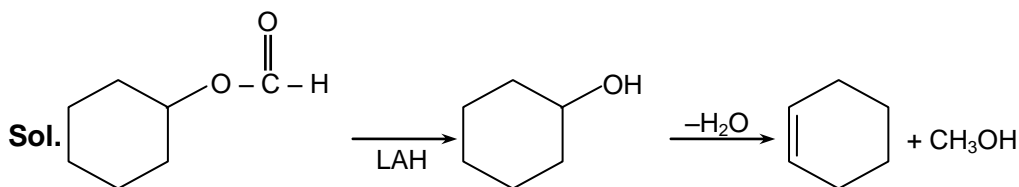
B



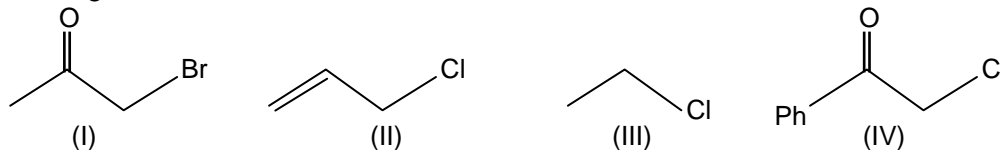
3. A compound M ($\text{C}_7\text{H}_{12}\text{O}_2$) has almost neutral solution in aqueous medium and is not reduced by H_2/Pd , BaSO_4 catalyst. On reduction by LiAlH_4 , it gives two products one of which on dehydration by Alumina (Al_2O_3) gives cyclohexene. M is:



B



4. Decreasing order of S_N2 .



a. I > II > III > IV

b. I > IV > II > III

c. II > III > I > IV

d. III > IV > I > II

B

Sol. e^- withdrawing group favour S_N2 .

5. Which of the following statements is not correct?

a. A colloidal solution is a heterogeneous two-phase system

b. Silver sol in water is an example of lyophilic sol

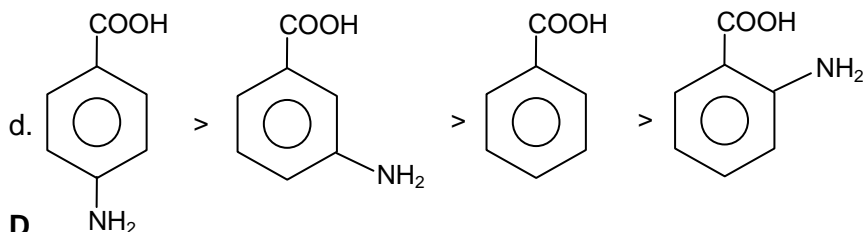
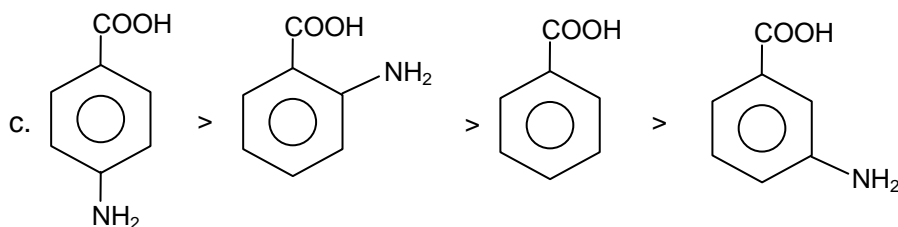
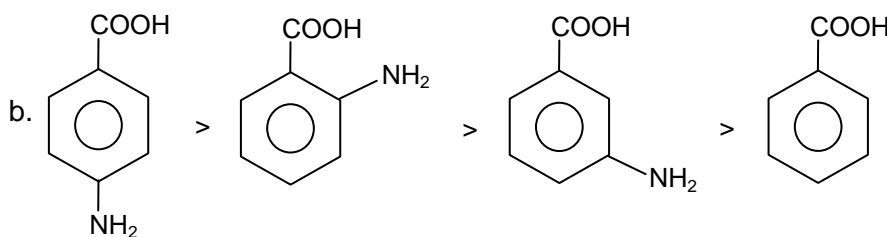
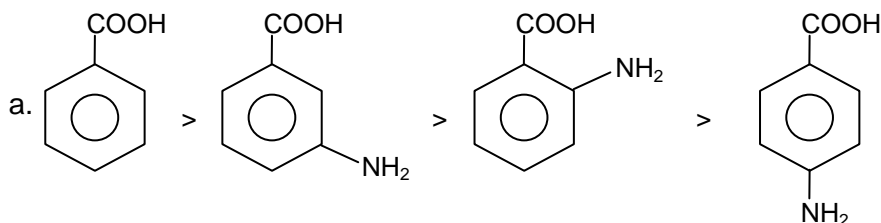
c. Metal hydroxides in water are examples of lyophobic sol

d. Liquid-liquid colloidal solution is not stable system

B

Sol. All metal solution are hyophobic.

6. Correct order of pK_a is:



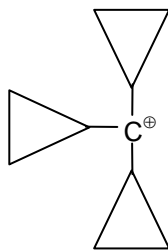
D

Sol. $pK_a \propto \frac{1}{\text{acid strength}}$; Ortho acids are weakest acids.

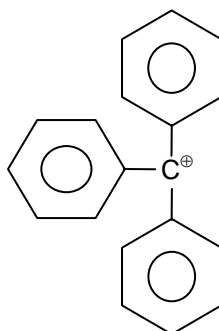
7. The correct stability order of cation is:



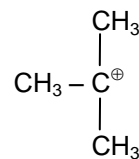
(I)



(II)



(III)



(IV)

- a. IV > I > II > III b. II > III > I > IV c. I > III > II > IV d. III > II > I > IV

B

8. Calculate ΔG° for conversion of oxygen to ozone $3/2 \text{ O}_2(\text{g}) \rightarrow \text{O}_3(\text{g})$ at 298 K, if K_p for this conversion is 2×10^{-29} :

- a. 163 kJ mol^{-1} b. $2.4 \times 10^2 \text{ kJ mol}^{-1}$ c. 1.63 kJ mol^{-1} d. $2.38 \times 10^6 \text{ kJ mol}^{-1}$

A

Sol. $\Delta G^\circ = -2.303 RT \log K_p$.

9. On increasing the velocity in a reversible reaction, the correct explanation of the effect of catalyst is

- a. It provides a new reaction path of low activation energy
 b. It increases the kinetic energy of reacting molecules
 c. It displaces the equilibrium state on right side
 d. It decreases the velocity of backward reaction

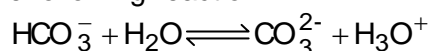
A

10. Which of the following is a buffer solution?

- a. 500 mL of 0.1 M CH_3COOH + 500 mL of 0.1 M NaOH
 b. 500 mL of 0.2 M CH_3COOH + 500 mL of 0.1 M NaOH
 c. 500 mL of 0.1 M CH_3COOH + 500 mL of 0.2 M NaOH
 d. 500 mL of 0.1 M CH_3COOH + 500 mL of 0.1 M HCl

B

11. In the following reaction:



Which two substances are Bronsted bases?

- a. CO_3^{2-} and H_3O^+ b. HCO_3^- and H_3O^+
 c. HCO_3^- and CO_3^{2-} d. CO_3^{2-} and H_2O

D

12. The monobasic acid among the following is:

- a. H_3PO_3 b. $\text{H}_2\text{S}_2\text{O}_7$ c. H_3PO_2 d. None

C

13. The oxidation potential of transition elements are lower than the oxidation potential of the s-block elements because :

- a. The hydration energy of transition metal cations is high
 b. The ionization energy of the transition elements is higher than that of corresponding s-block elements
 c. The ionization energy of transition elements is lower than that of the corresponding s-block elements
 d. The melting points of s-block element elements are low

B

14. Knowing that the chemistry of lanthanoids (Ln) is dominated by its +3 oxidation state, which of the following statement is incorrect?
- Because of the large size of Ln (III) ions, the bonding in its compounds is predominantly ionic in character
 - The ionic size of Ln (III) decrease in general with increasing atomic number
 - Ln (II) compounds are generally colourless
 - Ln (III) hydroxides are mainly basic in character

C

15. Ln^{3+} (trivalent lanthanoids ion) have electronic configuration :

- $[\text{Xe}]4f^1$ to $[\text{Xe}]4f^{14}$
- $[\text{Xe}]4d^1 4f^1$ to $[\text{Xe}]4d^1 4f^{14}$
- $[\text{Xe}] 4d^2 4f^0$ to $[\text{Xe}] 4d^1 4f^{14}$
- $[\text{Xe}] 4f^0$ to $[\text{Xe}]4f^{14}$

A

Sol. $\text{Ce}^{+3} = 4f^1$ & $\text{La}^{+3} = 4f^{14}$

16. Under which of the following conditions of Van der Waal's state equation a real gas resemble an ideal gas?

- "a" and "b" are large
- "a" and "b" are small
- "a" small and "b" is large
- "a" is large and "b" is small

B

17. According to MO theory,

- O_2^+ is paramagnetic and bond order greater than O_2
- O_2^+ is paramagnetic and bond order less than O_2
- O_2^+ is diamagnetic and bond order is less than O_2
- O_2^+ is diamagnetic and bond order is more than O_2

A

18. A sulphide ore is generally roasted to the oxide before reduction, because:

- The enthalpy of formation of CO_2 is more than that of CS_2
- A metal sulphide is generally more stable than the metal oxide
- No reducing agent is found suitable for reducing a sulphide ore
- A sulphide ore cannot be reduced at all

B

Sol. Enthalpy of formation of CO_2 is less (more negative) than that of CS_2 therefore it is more stable & readily formed on Reduction of oxide with carbon.

19. Match the metal in List – I with the process of refining of List – II

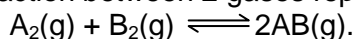
List – I		List – II	
(a)	Ni	(i)	Mond's process
(b)	Si	(ii)	Van Arkel method
(c)	Zr	(iii)	Distillation
(d)	Zn	(iv)	Zone refining

The correct answer is:

- | | | | | | | | |
|----------|----------|----------|----------|----------|----------|----------|----------|
| A | B | C | D | A | B | C | D |
| a. ii | iv | iii | i | b. iii | i | ii | iv |
| c. i | iv | ii | iii | d. i | iii | iv | ii |

C

20. Given the reaction between 2 gases represented by A_2 and B_2 to give the compound $\text{AB}(\text{g})$.



At equilibrium, the concentration

- of $\text{A}_2 = 3.0 \times 10^{-3} \text{ M}$
of $\text{B}_2 = 4.2 \times 10^{-3} \text{ M}$

of $AB = 2.8 \times 10^{-3} \text{ M}$

If the reaction takes place in a sealed vessel at 527°C , then the value of K_C will be:

- (a) 2.0 (b) 1.9 (c) 0.62 (d) 4.5

C

Sol. $A_2 + B_2 \rightleftharpoons 2AB$

$$K_C = \frac{(2.8 \times 10^{-3})^2}{3 \times 10^{-3} \times 4.2 \times 10^{-3}} = \frac{(2.8)^2}{3 \times 4.2} = 0.62$$

21. Choose the false statement"

- a. Easily fusible metals like Pb and Bi are purified by liquation
 b. Low boiling point metals like Zn and Hg are purified by boiling distillation
 c. Si, Ge, Ga are purified by poling
 d. Ti, Zr, V are purified by van Arkel method

C

22. If the radii of Mg^{2+} , Cs^{\oplus} , O^{2-} , S^{2-} , and Cl^{\ominus} ions are 0.65, 1.69, 1.40, 1.84 and 1.81 Å, respectively, calculate the coordination number of the cations in the crystals of MgS, MgO and CsCl:

- a. 4, 6, 8 b. 8, 6, 4 c. 6, 4, 8 d. 2, 4, 6

A

23. Potassium selenide is isomorphous with potassium sulphide and contains 50.0% of Se. The atomic weight of Se is:

- a. 142 b. 78 c. 47.33 d. 284

B

24. Which is not true about a bcc unit cell?

- a. The number of atoms in the unit cell is 2
 b. In addition to an atom at the centre of the body, in a unit cell there are 8 atoms at 8 different corners
 c. Contribution of corner centre atom is $\frac{1}{4}$ th per unit cell in BCC
 d. Contribution of corner atom is $\frac{1}{8}$ in BCC

C

25. 50 mL of standard gold solution needs 0.05 mg of gelatin for its protection from coagulation. Calculate the gold number of gelatin?

- a. 0.04 b. 0.01 c. 2 d. 0.09

B

Sol. For 50 ml = 0.05 mg gelatine required

$$\text{So } 10 \text{ ml} = \frac{0.05}{50} \times 10 = 0.01$$

26. Zeta potential (or electrokinetic potential) is the:

- a. Potential required to bring about coagulation of a colloidal sol.
 b. Potential required to give the particles a speed of 1 cm s^{-1} in the sol
 c. Potential difference between fixed charged layer and the diffused layer having opposite charges
 d. Potential energy of the colloidal particles

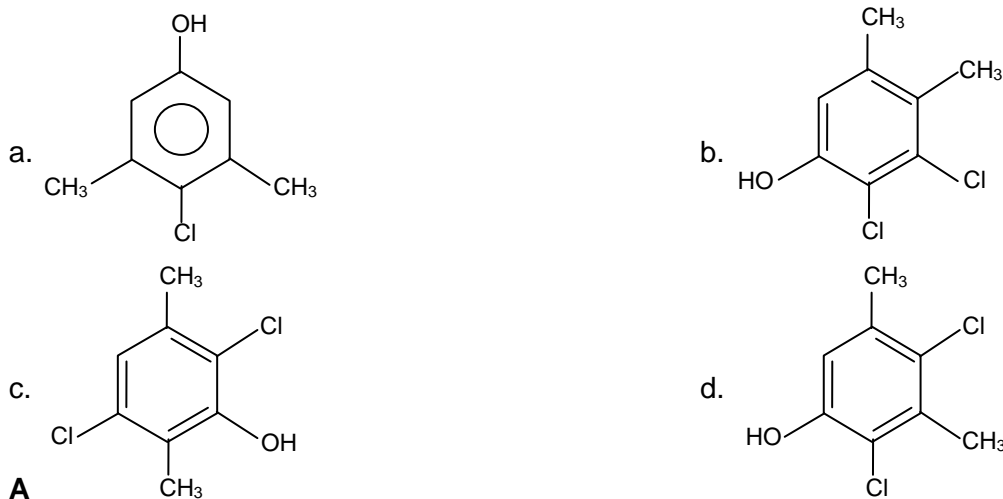
C

27. Toluene is nitrated and the resulting product is reduced with tin and hydrochloric acid. The product so obtained is diazotized and then heated with cuprous bromide. The reaction mixture so formed contains

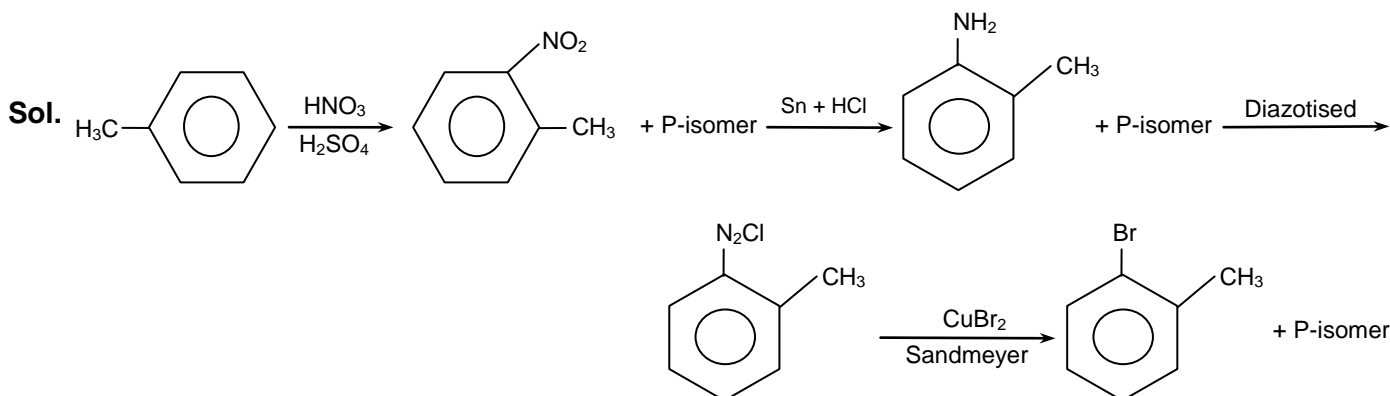
- a. mixture of o- and p-bromotoluenes b. mixture of o-and p-dibromobenzenes
 c. mixture of o- and p-bromoanilines d. mixture of o- and m-bromotoluenes

A

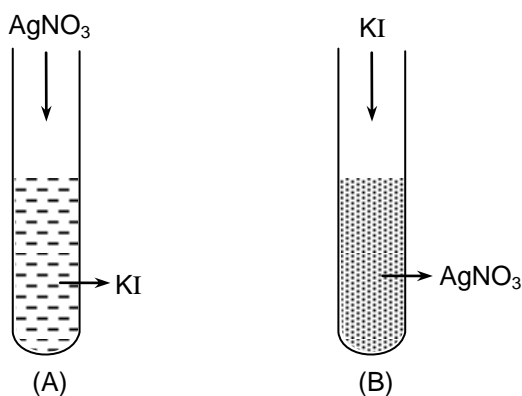
28. Which of the following is used in the antiseptic called Dettol?



A



29. A colloidal solution of AgI is prepared by two different methods as shown in the figure below

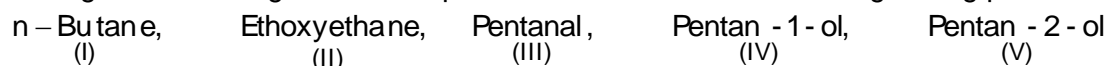


What is the charge of AgI colloidal particles in the two test tubes (A) and (B)?

- a. -ve & +ve b. +ve & -ve c. -ve & -ve d. +ve & +ve

A

30. Arrange the following sets of compounds in order of their increasing boiling points.



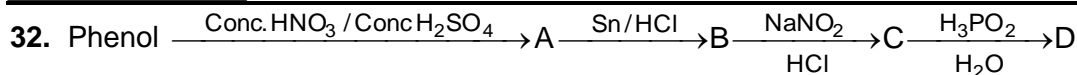
- a. I < II < III < V < IV < I
< I b. I < II < III < IV < V c. IV < V < III < II < I d. V < IV < III < II

A

31. Which catalyst is used for hydrogenation of carbon monoxide at high pressure and temperature

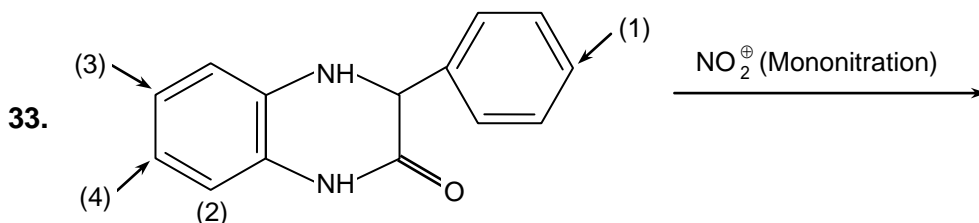
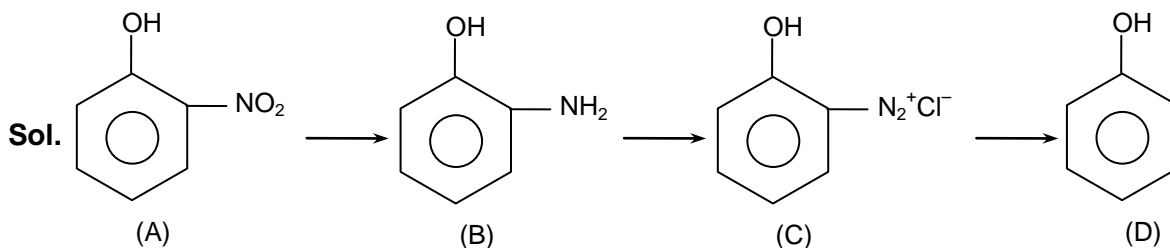
- a. Na₂Cr₂O₇/H₂SO₄ b. ZnO - Cr₂O₃ c. K₂Cr₂O₇/H₂SO₄ d. NaBH₄

B



- a. D is isomer of A
 b. D is tetrahydroxy benzene
 c. D is trihydroxy diazonium salt
 d. D is identical of initial reactant

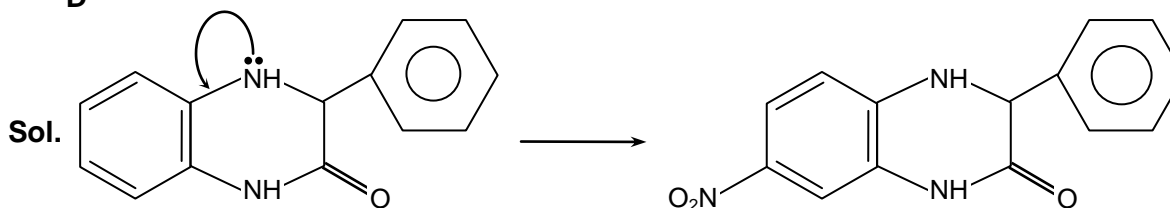
D



The nitration will mainly take place at position:

- a. 1 b. 2 c. 3 d. 4

D



34. Which set of quantum numbers represent the electron of the lowest energy?

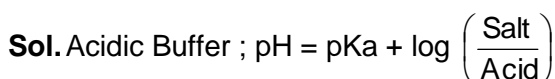
- a. $n = 2, l = 0, m = 0, s = -\frac{1}{2}$ b. $n = 2, l = 1, m = 0, s = +\frac{1}{2}$
 c. $n = 4, l = 1, m = 0, s = +\frac{1}{2}$ d. $n = 4, l = 0, m = 0, s = -\frac{1}{2}$

A

35. The pK_a of HCN is 9.30. The pH of a solution prepared by mixing 2.5 moles of KCN and 2.5 moles of HCN in water and making up the total volume of 500 mL is:

- a. 9.30 b. 7.30 c. 10.30 d. 8.30

A

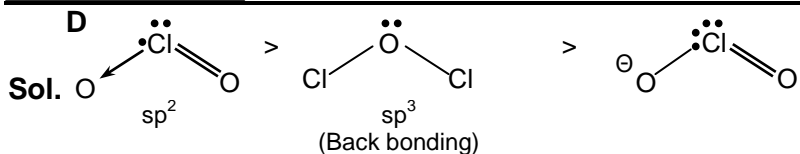


$$\text{pH} = 9.3 + \log \frac{2.5}{2.5}$$

$$\text{pH} = 9.3$$

36. The correct order of increasing bond angles in the following species is:

- a. $\text{Cl}_2\text{O} < \text{ClO}_2 < \text{ClO}_2^-$ b. $\text{ClO}_2 < \text{Cl}_2\text{O} < \text{ClO}_2^-$
 c. $\text{Cl}_2\text{O} < \text{ClO}_2^- < \text{ClO}_2$ d. $\text{ClO}_2^- < \text{Cl}_2\text{O} < \text{ClO}_2$



37. If the concentration of OH^- ions in the reaction $\text{Fe}(\text{OH})_3(\text{s}) \rightleftharpoons \text{Fe}^{3+}(\text{aq}) + 3\text{OH}^-(\text{aq})$, is decreased by $\frac{1}{4}$ times, then equilibrium concentration of Fe^{3+} will increased by:

- a. 16 times b. 64 times c. 4 times d. 8 times

B

38. Which of the following set contains all molecular crystals?

- a. LiF , solid CO_2 , wax, diamond b. ZnS , silicon, I_2 , NaCl
 c. Solid CO_2 , wax, I_2 , Ice d. SiC , graphite, caesium chloride, rubber

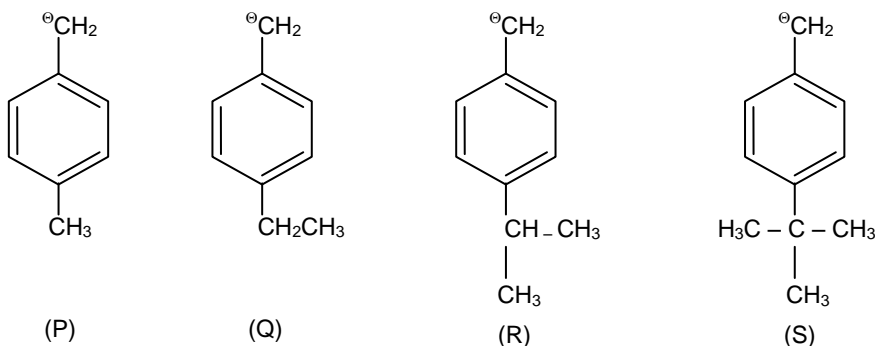
C

39. An electrochemical cell is arranged as follows $\text{Pt} | \text{H}_2, 1 \text{ atm} | 0.1 \text{ M HCl} || 0.1 \text{ M acetic acid} | \text{H}_2, 1 \text{ atm} | \text{Pt}$. The emf of the cell will not be zero because

- a. The pH of 0.1 M HCl and 0.1 M acetic acid is not the same
 b. Acids are different in the two parts
 c. The emf of the cell depends upon the molarity of acids as well as pressure of gas.
 d. Temperature is constant

A

40. Arrange the following according to stability of anion



- a. $R > S > Q > P$ b. $P > S > R > Q$ c. $Q > P > S > R$ d. $S > R > Q > P$

D

41. Which of the following is wrong?

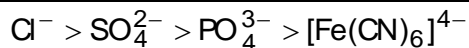
- a. packing fraction in simple cubic lattice is $\frac{\sqrt{2}}{6} \pi$
 b. packing fraction in body centred cubic lattice is $\frac{\sqrt{3}}{8} \pi$
 c. packing fraction in fcc centred cubic lattice is $\frac{\sqrt{2}}{6} \pi$
 d. The distance between the two nearest neighbours in simple cubic lattice of axial length ' l ' is also ' l '

A

Sol. It is $\frac{\pi}{6}$

42. The flocculating power of the given ions for the specified colloidal sols will be such that

- | | |
|--|---|
| Arsenic sulphide sol | Ferric hydroxide sol |
| a. $[\text{Fe}(\text{CN})_6]^{4-} > \text{PO}_4^{3-} > \text{SO}_4^{2-} > \text{Cl}^-$ | $\text{Al}^{3+} > \text{Ba}^{2+} > \text{Na}^+$ |
| b. $\text{Al}^{3+} > \text{Ba}^{2+} > \text{Na}^+$ | $[\text{Fe}(\text{CN})_6]^{4-} > \text{PO}_4^{3-} > \text{SO}_4^{2-} > \text{Cl}^-$ |



B

43. Consider the following solutions:

(I) 1M aqueous glucose

(II) 1M aqueous NaCl

(III) 1M $\text{C}_6\text{H}_5\text{COOH}$ in C_6H_6

(IV) 1M $(\text{NH}_4)_3\text{PO}_4$

Which is not correct?

a. All are isotonic solutions

b. III is hypotonic to I, II, IV

c. I, II, IV are hypertonic to III

d. IV is hypertonic to I, II, III

A

44. An ideal gas is compressed reversibly and adiabatically. Incorrect statement is-

a. temperature will increase

b. internal energy will increase

c. entropy will increase

d. pressure will increase

C

Sol. Entropy will decrease

45. Which of the following will have three stereoisomeric forms?

i. $[\text{Cr}(\text{NO}_3)_3(\text{NH}_3)_3]$

ii. $\text{K}_3[\text{Co}(\text{C}_2\text{O}_4)_3]$

iii. $\text{K}_3[\text{Co}(\text{C}_2\text{O}_4)_2\text{Cl}_2]$

iv. $[\text{Co}(\text{en})_2\text{ClBr}]$

a. iii and iv

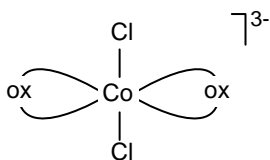
b. i and iv

c. ii and iii

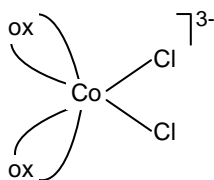
d. i and ii

A

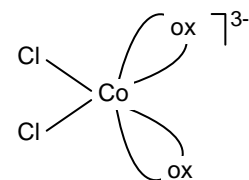
Sol. The complex $[\text{Co}(\text{C}_2\text{O}_4)_2\text{Cl}_2]^{3-}$ show both geometrical and optical isomers.



trans- $[\text{CoCl}_2(\text{ox})_2]^{3-}$



Mirror



cis- $[\text{CoCl}_2(\text{ox})_2]^{3-}$