

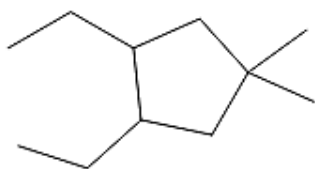
JEE Main - 2023

Chemistry

Section A

This Section A contains 20 multiple choice questions from 1 to 20. Each question has 4 choices (A), (B), (C) and (D) for its answer, out of which only one is correct.

- Which of the following statements is true?
 - HF is less polar than HBr
 - Absolutely pure water does not contain any ions
 - Chemical bond formation take place when forces of attraction overcome the forces of repulsion
 - In covalency transference of electron takes place
- Value of Vant Hoff factor for sodium bicarbonate after complete ionization is
 - Zero
 - Three
 - Five
 - Four
- 20 mL of 0.1M H_2SO_4 solution is added to 30 mL of 0.2M NH_4OH solution. The pH of the resultant mixture is [pK_b of $NH_4OH = 4.7$]
 - 9.4
 - 9.0
 - 5.0
 - 5.2
- Correct IUPAC name of the given compound is



- 1,2-Diethyl-4,4-dimethylcyclopentane
- 3,4-Diethyl-1,1-dimethylcyclopentane
- 1,5-Diethyl-3,3-dimethylcyclopentane
- 3,3-Dimethyl-1,5-diethylcyclopentane

5. Choose the correct match

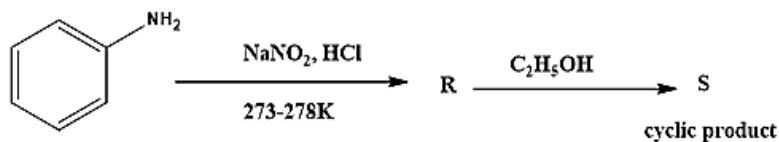
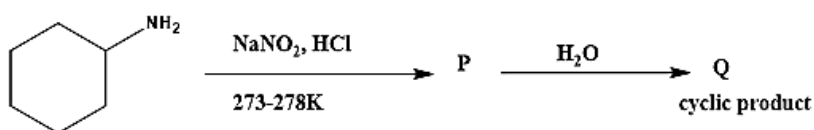
	Name reaction		Reagents or reactants of reaction
A.	Rosenmund reduction.	i.	stannous chloride in the presence of hydrochloric acid
B.	Stephen reaction	ii.	heating with concentrated alkali
C.	Etard reaction	iii.	chromyl chloride
D.	Cannizzaro reaction	iv.	palladium on barium sulphate.

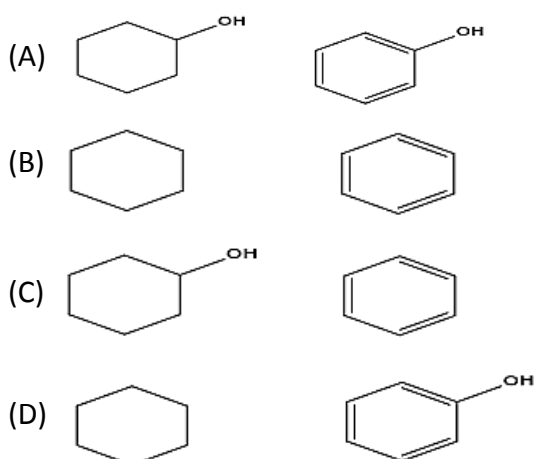
- (A) A-iv, B-i, C-iii, D-ii
 (B) A-iii, B-iv, C-ii, D-i
 (C) A-ii, B-i, C-iii, D-iv
 (D) A-i, B-ii, C-iii, D-iv

6. Among the following, the crystalline solid compound are _____

- (A) Polyurethane,
 (B) Naphthalene,
 (C) Benzoic acid,
 (D) Teflon,
 (E) Potassium nitrate,
 (F) Cellophane
 (A) A, B & E only
 (B) A, B & C only
 (C) B, C & E only
 (D) A, D, E & F only

7. Consider the above given equations, compound *Q* and *S* respectively are

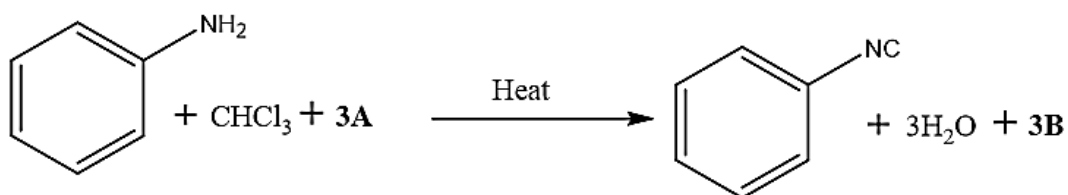




8. Which among the following contains sulphur atom
- (A) Seldane
(B) Dimetane
(C) Histamine
(D) Cimetidine
9. A gas mixture contains 50% helium and 50% methane by volume. What is the percentage by mass of methane in the mixture?
- (A) 19.97%
(B) 20.05%
(C) 50%
(D) 80.03%
10. Coordination compounds have great importance in biological systems. In this context which of the following statements is incorrect?
- (A) Chlorophylls are green pigments in plants and contains calcium
(B) Carboxypeptidase – A is an enzyme and contains zinc
(C) Cyanocobalamin is B_{12} and contains cobalt
(D) Haemoglobin is the red pigment of blood and contains iron
11. The ammonia evolved from the treatment of 0.30 g of an organic compound for the estimation of nitrogen was passed in 100 mL of 0.1 M sulphuric acid. The excess of acid required 20 mL of 0.5M sodium hydroxide solution for complete neutralization. The organic compound is
- (A) acetamide
(B) thiourea
(C) urea

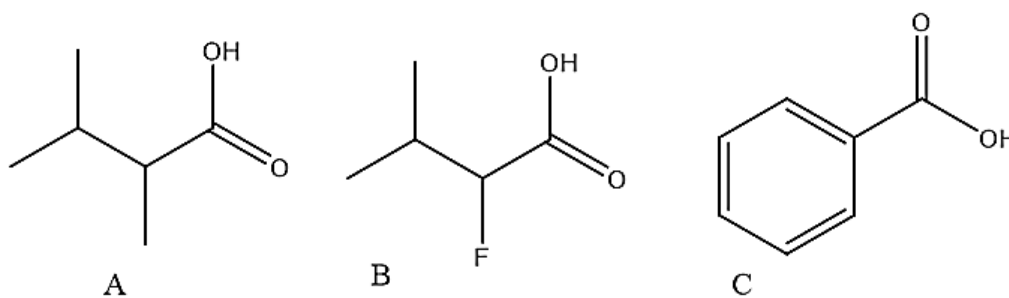
(D) benzamide

12. Consider the above reaction, the *A* and *B* respectively are



- (A) *KOH* and *KCl*
- (B) *KOH* and *NH₄Cl*
- (C) *NH₄Cl* and *KOH*
- (D) *KCl* and *KOH*

13. The correct order of acidic behaviour of the above compounds is:



- (A) $A > B > C$
- (B) $C > B > A$
- (C) $B > C > A$
- (D) $A > C > B$

14. RNA is different from DNA because RNA contains

- (A) ribose sugar and thymine
- (B) ribose sugar and uracil
- (C) deoxyribose sugar and thymine
- (D) deoxyribose sugar and uracil

15. The metal extracted by leaching with a cyanide is

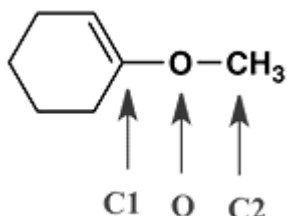
- (A) *Mg*
- (B) *Ag*
- (C) *Cu*
- (D) *Na*

16. Alum helps in purifying water by
- forming Si complex with clay particles
 - sulphate part which combines with the dirt and removes it
 - Coagulating the mud particles
 - making mud water soluble
17. 1 mole $NaCl$ and 1 mole HCl are present in an aqueous solution. The solution is
- not a buffer solution with $p^H < 7$
 - not a buffer solution with $p^H > 7$
 - a buffer solution with $p^H < 7$
 - a buffer solution with $p^H > 7$
18. Which one of the following is an amphoteric oxide?
- Na_2O
 - SO_2
 - B_2O_3
 - ZnO
19. Standard reduction electrode potentials of three metals A, B and C are respectively $+0.5V, -3.0V$ and $-1.2V$. The reducing powers are in the order
- $A > B > C$
 - $C > B > A$
 - $A > C > B$
 - $B > C > A$
20. A gas bubble, from an explosion under water oscillates with a period T proportional to $P^a d^b E^c$, where P is the static pressure, d is the density of water and E is the total energy of the explosion. Find the values of a, b and c .
- $a = \frac{5}{6}, b = \frac{1}{2}$ and $c = \frac{1}{3}$
 - $a = \frac{-5}{6}, b = \frac{1}{2}$ and $c = \frac{1}{3}$
 - $a = \frac{-5}{6}, b = \frac{1}{2}$ and $c = \frac{2}{3}$
 - $a = \frac{5}{6}, b = \frac{3}{2}$ and $c = \frac{1}{3}$

Section-B

This Section B contains 10 Integer Type Questions from 21 to 30. Attempt any 5 Questions.

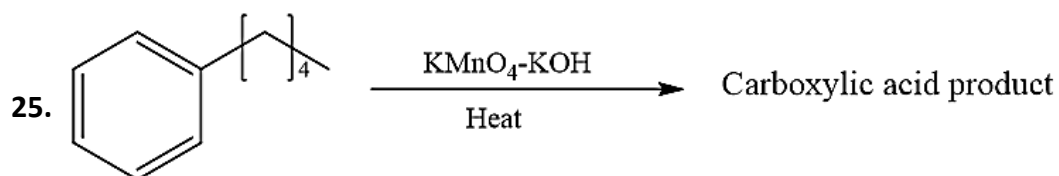
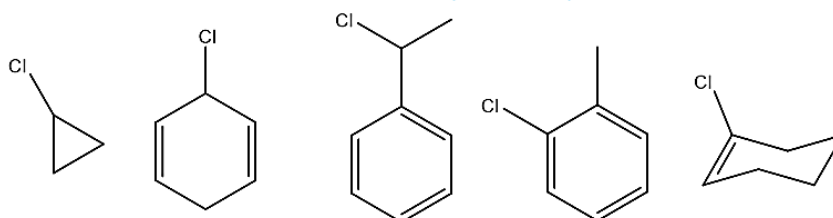
21. What is the bond angle between C_1 and O ?



22. 10.5 mL of a solution of barium hydroxide on titration with a 0.1 molar solution of hydrochloric acid gave a titre value of 70 mL. The molarity of barium hydroxide solution was _____ 10^{-2}

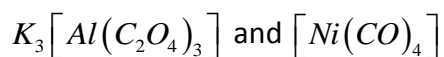
23. A first order reaction has a rate constant of $15 \times 10^{-3} \text{ s}^{-1}$. How long will 5 g of this reactant take to reduce to 3.0 g _____ sec

24. The total number of aromatic halide among the following is/are _____



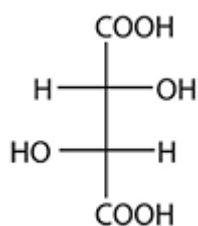
The number of carbon atoms present in the product of the above reaction are _____

26. The sum of oxidation states of Ni and Al in the given co-ordinate compounds is _____



27. Hydrolysis of XeF_4 and XeF_6 with water gives XeO_3 , the ratio of HF molecules formed in the reaction of XeF_4 to XeF_6 is _____

28. How many stereoisomers are there for the following structure _____



29. The EMF of the given cell equation is $(-x) \times 10^{-2}$, the value of x is _____ (Integer value)

30. The "spin – only" magnetic moment [in units of Bohr magneton of Ni^{2+} in aqueous solution would be (Atomic number of $Ni = 28$)

