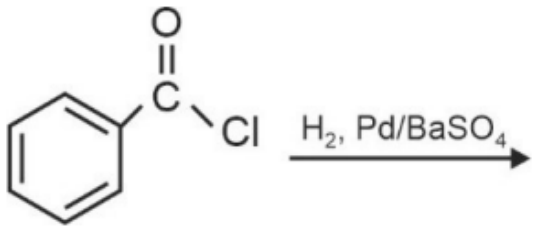
JEE Main 2024 Chemistry Question Paper Jan 30 Shift 1

1. What is the name of the given reaction?



(1) Etard reaction
(2) Stephen's reaction
(3) Wolff Kishner reduction
(4) Rosenmund reaction

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2. Which of the given compounds will not give Fehling test?

(1) Lactose
(2) Maltose
(3) Sucrose
(4) Glucose

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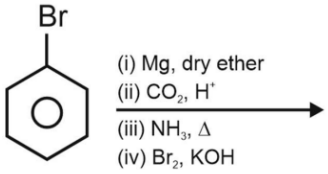
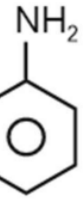
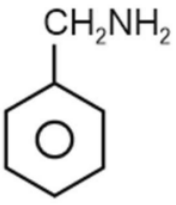
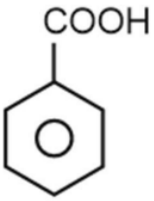
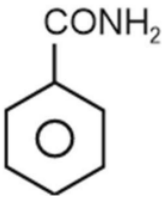
3. Find final product of reaction given below



(1) 

(2) 

(3) 

(4) 

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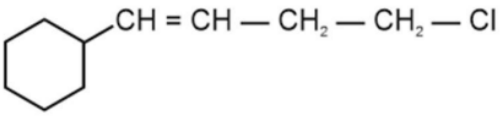
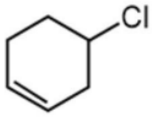
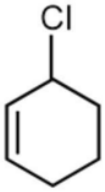
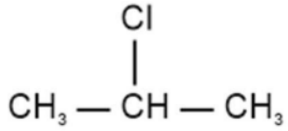
4. Which of the following has an allylic halogen?

(1) 

(2) 

(3) 

(4) 

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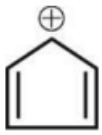
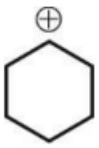
5. Which of the following compound or ion is most stable?

(1) 

(2) 

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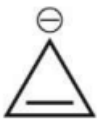
(4) 

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6. Which of the following set contains both diamagnetic ions?

(1) Ni^{2+}, Cu^{2+}
(2) Eu^{3+}, Gd^{3+}
(3) Cu^{+}, Zn^{2+}
(4) Ce^{4+}, Pr^{3+}

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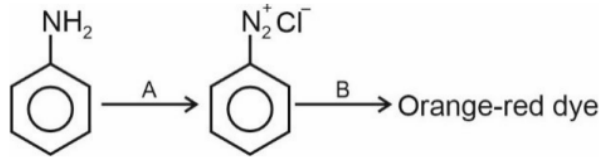
7. Consider the following sequence of reactions:



Select the option with correct A and B respectively.

(1) HNO_3, Phenol
(2) $NaNO_2$/HCl, Phenol

(3) HNO_3, Aniline
(4) $NaNO_2$/HCl, Aniline

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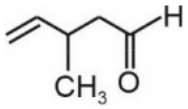
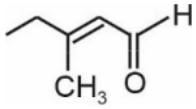
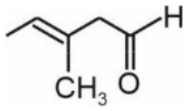
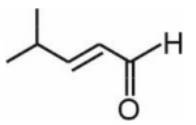
8. Which of the following is the correct structure for the given IUPAC name "3-Methylpent-2-enal"?

(1) 

(2) 

(3) 

(4) 

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9. The group number of Ununnium is:

(1) 11
(2) 12
(3) 6
(4) 14

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10. What is the Geometry of Aluminium chloride in aqueous solution?

(1) Square planar
(2) Octahedral
(3) Tetrahedral
(4) Square pyramidal

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11. Statement-I: For hydrogen atom, 3p and 3d are degenerate.
Statement-II: Degenerate orbitals have same energy.
Which of the following is correct?

(1) Both statement-I and II are correct
(2) Both statement-I and II are incorrect
(3) Statement-I is correct, statement-II is incorrect
(4) Statement-I is incorrect, statement-II is correct

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12. Consider the following sequence of reactions:

$$CH_3C = CH - Na \rightarrow CH_3C = CNa + H_2(g)$$

Select A and B respectively.

(1) CH_3-C=CH, CH_3-C=CH-CH_3
(2) CH_3-C=Na, CH_3-C=CH-CH_3

(3) CH_3-C=CH, CH_3-C=CH-CH_3
(4) CH_3-C=CH, CH_3-C=CH-CH_3

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13. Choose the correct option.

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

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14. Assertion (A): While moving from As to Bi, covalent radius increases significantly, but from As to Bi only a small increase is observed.
Reason (R): For a particular oxidation state, covalent radii and ionic radii generally increase down the group.
Which of the following is correct?

(1) Both (A) and (R) are correct and (R) is the correct explanation of (A).
(2) Both (A) and (R) are correct, but (R) is not the correct explanation of (A).
(3) (A) is correct, but (R) is incorrect.
(4) (A) is incorrect, but (R) is correct.

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15. Match the following and select the correct option.

(1) Mn^{2+} - $3d^5$ $4s^1$
(2) V^+ - $3d^4$ $4s^2$
(3) Cr^{3+} - $3d^5$ $4s^0$
(4) Fe^{2+} - $3d^6$ $4s^2$

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16. What happens to the freezing point of benzene, when small amount of naphthalene is added to benzene?

(1) Increases
(2) Decreases
(3) Remains unchanged
(4) First decreases and then increases

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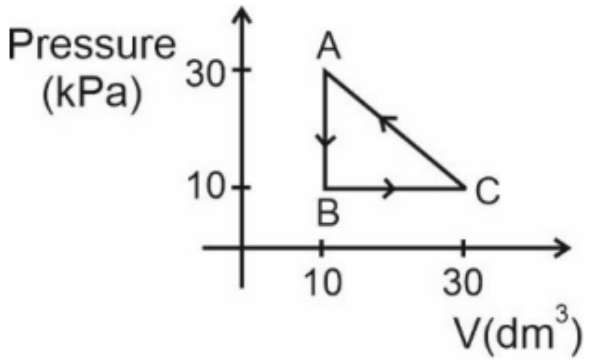
17. A mixture is heated with dilute H_2SO_4 and the lead acetate paper turns black by the evolved gas. The mixture contains:

(1) Sulphite
(2) Sulphide
(3) Sulphate
(4) Thiosulphate

21. Find out sum of coefficients of all the species involved in balance equation:

$$2MnO_4^- + I^- \xrightarrow{\text{Alkaline Medium}} 2MnO_2 + I_2$$

22. Find work done in cyclic process (in J):



23. Maximum number of hybrid orbitals formed when 2s and 2p orbitals of a single atom are mixed.

24. The rate of first order reaction is 0.04 mol L^{-1} $sec^{-}1$ at 10°C and 0.03 mol L^{-1} $sec^{-}1$ at 20°C. Calculate half-life of first order reaction (in sec).

25. The number of atoms in a silver plate having area 0.05 cm^2 and thickness 0.05 cm is _____ $\times 10^{19}$

26. The ratio of magnitude of potential energy and kinetic energy for 5^{th} excited state of hydrogen atom is:

27. 250 mL solution of CH_3COONa of molarity 0.35 M is prepared. What is the mass of CH_3COONa required in grams? (Nearest integer)

28. The Ksp of $Mg(OH)_2$ is 1×10^{-12}, 0.01 M Mg^2+ ion will precipitate at the limiting pH equal to _____ (at 25°C).