

JEE-MAIN EXAM JANUARY, 2024

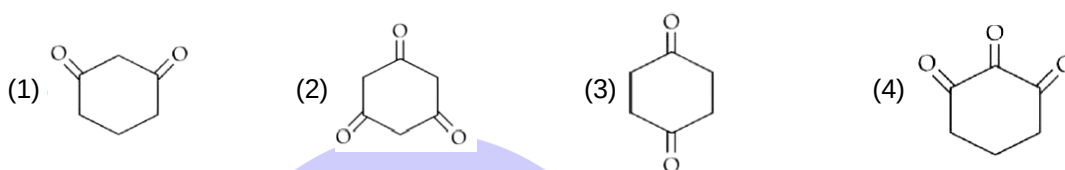
Date: - 27-01-2024 (SHIFT-1)

CHEMISTRY**SECTION-A**

1. Two nucleotides are joined together by a linkage known as :

- (1) Phosphodiester linkage (2) Glycosidic linkage
(3) Disulphide linkage (4) Peptide linkage

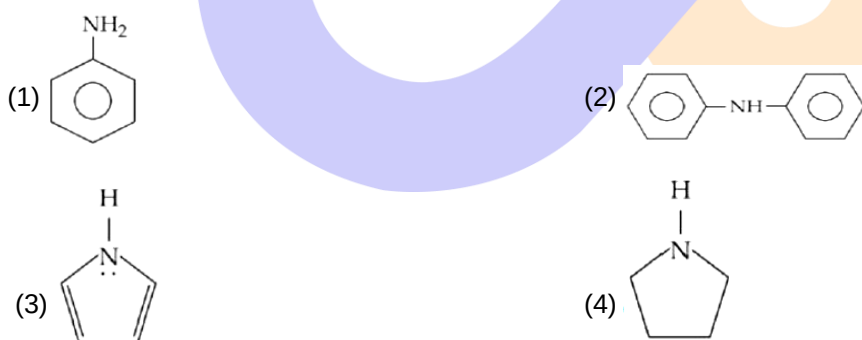
2. Highest enol content will be shown by :



3. Element not showing variable oxidation state is :

- (1) Bromine (2) Iodine (3) Chlorine (4) Fluorine

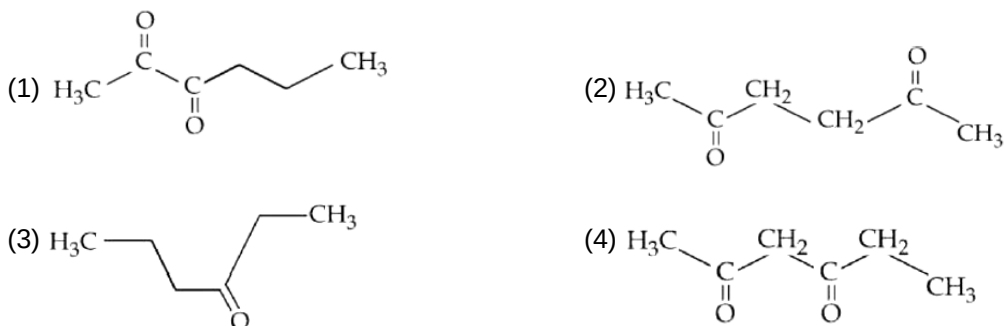
4. Which of the following is strongest Bronsted base



5. Which of the following electronic configuration would be associated with the highest magnetic moment?

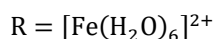
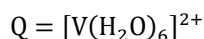
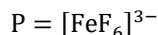
- (1) $[\text{Ar}]3d^7$ (2) $[\text{Ar}]3d^8$ (3) $[\text{Ar}]3d^3$ (4) $[\text{Ar}]3d^6$

6. Which of the following has highly acidic hydrogen?



7. A solution of two miscible liquids showing negative deviation from Raoult's law will have :
- (1) increased vapour pressure, increased boiling point
 - (2) increased vapour pressure, decreased boiling point
 - (3) decreased vapour pressure, decreased boiling point
 - (4) decreased vapour pressure, increased boiling point

8. Consider the following complex ions



The correct order of the complex ions, according to their spin only magnetic moment values (in B.M.) is:

- (1) $R < Q < P$ (2) $R < P < Q$ (3) $Q < R < P$ (4) $Q < P < R$
9. Choose the polar molecule from the following :
- (1) CCl_4 (2) CO_2 (3) $\text{CH}_2 = \text{CH}_2$ (4) CHCl_3

10. Given below are two statements :

Statement (I) : The 4f and 5f - series of elements are placed separately in the Periodic table to preserve the principle of classification.

Statement (II) : S-block elements can be found in pure form in nature. In the light of the above statements, choose the most appropriate answer from the options given below :

- (1) Statement I is false but Statement II is true
- (2) Both Statement I and Statement II are true
- (3) Statement I is true but Statement II is false
- (4) Both Statement I and Statement II are false

11. Given below are two statements :

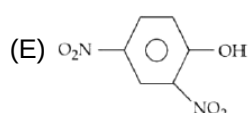
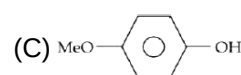
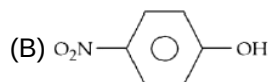
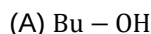
Statement (I) : p-nitrophenol is more acidic than m-nitrophenol and o-nitrophenol.

Statement (II) : Ethanol will give immediate turbidity with Lucas reagent.

In the light of the above statements, choose the correct answer from the options given below :

- (1) Statement I is true but Statement II is false
- (2) Both Statement I and Statement II are true
- (3) Both Statement I and Statement II are false
- (4) Statement I is false but Statement II is true

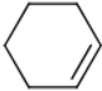
12. The ascending order of acidity of $-\text{OH}$ group in the following compounds is :



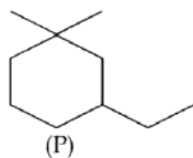
Choose the correct answer from the options given below :

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

13. Given below are two statements : one is labelled as Assertion (A) and the other is labelled as Reason (R). Assertion (A) : Melting point of Boron (2453 K) is unusually high in group 13 elements. Reason (R) : Solid Boron has very strong crystalline lattice. In the light of the above statements, choose the most appropriate answer from the options given below;
- (1) Both (A) and (R) are correct but (R) is not the correct explanation of (A)
 - (2) Both (A) and (R) are correct and (R) is the correct explanation of (A)
 - (3) (A) is true but (R) is false
 - (4) (A) is false but (R) is true

14. Cyclohexene  is _____ type of an organic compound.

- (1) Benzenoid aromatic
 - (2) Benzenoid non-aromatic
 - (3) Acyclic
 - (4) Alicyclic
15. Yellow compound of lead chromate gets dissolved on treatment with hot NaOH solution. The product of lead formed is a :
- (1) Tetraanionic complex with coordination number six
 - (2) Neutral complex with coordination number four
 - (3) Dianionic complex with coordination number six
 - (4) Dianionic complex with coordination number four
16. Given below are two statements :
- Statement (I) :** Aqueous solution of ammonium carbonate is basic.
- Statement (II) :** Acidic/basic nature of salt solution of a salt of weak acid and weak base depends on K_a and K_b value of acid and the base forming it.
- In the light of the above statements, choose the most appropriate answer from the options given below:
- (1) Both Statement I and Statement II are correct
 - (2) Statement I is correct but Statement II is incorrect
 - (3) Both Statement I and Statement II are incorrect
 - (4) Statement I is incorrect but Statement II is correct
17. IUPAC name of following compound (P) is :



- (1) 1-Ethyl-5, 5-dimethylcyclohexane
 - (2) 3-Ethyl-1,1-dimethylcyclohexane
 - (3) 1-Ethyl-3, 3-dimethylcyclohexane
 - (4) 1,1-Dimethyl-3-ethylcyclohexane
18. NaCl reacts with conc. H_2SO_4 and $K_2Cr_2O_7$ to give reddish fumes (B), which react with NaOH to give yellow solution (C). (B) and (C) respectively are ;
- (1) CrO_2Cl_2 , Na_2CrO_4
 - (2) Na_2CrO_4 , CrO_2Cl_2
 - (3) CrO_2Cl_2 , $KHSO_4$
 - (4) CrO_2Cl_2 , $Na_2Cr_2O_7$

19. The correct statement regarding nucleophilic substitution reaction in a chiral alkyl halide is ;
- (1) Retention occurs in S_N1 reaction and inversion occurs in S_N2 reaction.
 - (2) Racemisation occurs in S_N1 reaction and retention occurs in S_N2 reaction.
 - (3) Racemisation occurs in both S_N1 and S_N2 reactions.
 - (4) Racemisation occurs in S_N1 reaction and inversion occurs in S_N2 reaction.
20. The electronic configuration for Neodymium is:
- [Atomic Number for Neodymium 60]
- (1) $[Xe]4f^4 6s^2$
 - (2) $[Xe]5f^4 7s^2$
 - (3) $[Xe]4f^6 6s^2$
 - (4) $[Xe]4f^{15} d^1 6s^2$

SECTION-B

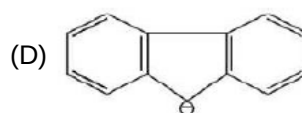
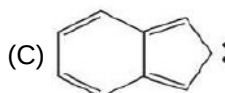
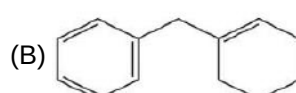
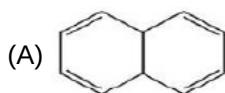
21. The mass of silver (Molar mass of Ag: 108g mol^{-1}) displaced by a quantity of electricity which displaces 5600 mL of O_2 at S.T.P. will be g.
22. Consider the following data for the given reaction $2HI_{(g)} \rightarrow H_{2(g)} + I_{2(g)}$

	1	2	3
HI (mol L ⁻¹)	0.005	0.01	0.02
Rate (mol L ⁻¹ s ⁻¹)	7.5×10^{-4}	3.0×10^{-3}	1.2×10^{-2}

The order of the reaction is

23. Mass of methane required to produce 22 g of CO_2 after complete combustion is g.
(Given Molar mass in g mol⁻¹)
- C = 12.0
H = 1.0
O = 16.0)

24. If three moles of an ideal gas at 300 K expand isothermally from 30dm^3 to 45dm^3 against a constant opposing pressure of 80kPa, then the amount of heat transferred is J.
25. 3-Methylhex-2-ene on reaction with HBr in presence of peroxide forms an addition product (A). The number of possible stereoisomers for 'A' is
26. Among the given organic compounds, the total number of aromatic compounds is



27. Among the following, total number of meta directing functional groups is (Integer based)
- $-OCH_3$, $-NO_2$, $-CN$, $-CH_3$, $-NHCOCH_3$,
 $-COR$, $-OH$, $-COOH$, $-Cl$

28. The number of electrons present in all the completely filled subshells having $n = 4$ and $s = +\frac{1}{2}$ is
(Where n = principal quantum number and s = spin quantum number)
29. Sum of bond order of CO and NO^+ is
30. From the given list, the number of compounds with +4 oxidation state of Sulphur
 $\text{SO}_3, \text{H}_2\text{SO}_3, \text{SOCl}_2, \text{SF}_4, \text{BaSO}_4, \text{H}_2\text{S}_2\text{O}_7$



NTA ANSWERS

- | | | | | | | | | | | | | | |
|-----|---------------|-----|-----|-----|------|-----|--------|-----|-----|-----|-----|-----|-----|
| 1. | (1) | 2. | (2) | 3. | (4) | 4. | (4) | 5. | (4) | 6. | (4) | 7. | (4) |
| 8. | (3) | 9. | (4) | 10. | (3) | 11. | (1) | 12. | (4) | 13. | (2) | 14. | (4) |
| 15. | (4) | 16. | (1) | 17. | (2) | 18. | (1) | 19. | (4) | 20. | (1) | | |
| 21. | 107 gm or 108 | 22. | (2) | 23. | (8) | 24. | (1200) | 25. | (4) | | | | |
| 26. | (3) | 27. | (4) | 28. | (16) | 29. | (6) | 30. | (3) | | | | |