

JEE MAIN QUESTION PAPER 27 JANUARY 2024

CHEMISTRY:

1. If SN^1 is a racemisation reaction, then which of the following will be the correct reaction for SN^2 ?

Answer. SN^2 is inversion reaction

2. Which of the following does not show a variable oxidation state?

- Flourine
- Chlorine
- Bromine
- Iodine

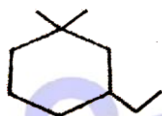
Answer. i. Fluorine

3. Which of the following compounds are polar?

- CCl_4
- $CH_2 = CH_2$
- CO_2
- CH_3Cl

Answer. CH_3Cl

4. What is the correct IUPAC name of the following compound?



- 1 - ethyl - 3,3-dimethyl cyclohexane
- 3 - ethyl - 1,1-dimethyl cyclohexane
- 1 - ethyl - 3,3-dimethyl cyclohexene
- 3 - ethyl - 1,1-dimethyl cyclohexene

Answer. 3-ethyl-1,1-dimethyl cyclohexane

5. The compound $(CH_2)_4C_2H_2$ is:

- Alicyclic
- Aromatic
- Antiaromatic
- Acyclic

Answer. Alicyclic

6. In which of the following compounds, which central atom has +4 oxidation state?

- SO_3
- H_2SO_3
- $H_2S_2O_7$
- $BaSO_4$

Answer: H_2SO_3

7. What is the electronic configuration of Neodymium (60) Nd?

Answer: $[Xe]5f^44d^1$

8. Ethanol shows turbidity with Lucas reagent after going through which process?

Answer: Upon Heating

9. Which type of linkage is present in nucleotide between base and sugar?

Answer: N-Glycosidic Linkage

11. Find out the number of stereoisomers obtained when 3-methylhex-2-ene reacts with HBr in the presence of peroxide.

Answer. 4

12. Among the following, the number of meta-directing groups is:

-CN, -NO₂, -COOH, CH₃, -SO₃H, NH₃⁺, -F

Answer. 4

13. Assertion: Boron is a Hard Element.

Reason: Boron has an unusually high melting point due to its crystalline structure.

- i. Both Assertion and Reason are true and Reason is the correct explanation of Assertion
- ii. Both Assertion and Reason are true but Reason is not the correct explanation of Assertion
- iii. A is true, R is not
- iv. R is true, A is not

Answer. ii.

14. PbCrO₄ reacts in the presence of NaOH to give which complex?

- i. Dianionic with CN = 6
- ii. Dianionic with CN = 4
- iii. Neutral with CN = 4
- iv. Trianionic with CN = 6

Answer. ii.

15. Which of the following configurations has the strongest metallic bonding?

- i. [Ar]3d⁷4s²
- ii. [Ar]3d⁵4s¹
- iii. [Ar]3d⁶4s²
- iv. [Ar]3d³4s²

Answer. iv.

16. Assertion: All s-block Elements are found in Nature

Reason: 4f and 5f Series Periodic table are kept below

- i. Assertion and Reason, both are true and Reason is correct explanation of Assertion
- ii. Assertion and Reason, both are true and Reason is not correct explanation of Assertion.
- iii. Assertion is True, but Reason is False.
- iv. Assertion is False but Reason is True

Answer. ii.

17. Find out the sum of bond orders of CO & NO⁺.

Answer. 6

18. It is given that radius of 3rd stationary Orbit is r , find out radius of 4th stationary orbit.

Answer. $9r/16$

19. Calculate the temperature (in K) at which the kinetic energy of monoatomic gaseous molecule is equal to 0.414 eV.

Answer. 3198 K

20. Which of the following is a complex with maximum spin angular momentum?

- i. $[\text{FeF}_6]^{3-}$
- ii. $[\text{Fe}(\text{CN})_6]^{3-}$
- iii. $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$
- iv. $[\text{V}(\text{H}_2\text{O})_6]^{2+}$

Answer. i.

21. A solution of two volatile components showing negative deviation from Raoult's law shows:

- i. A Decrease in vapour pressure, boiling point increases
- ii. Increase in vapour pressure, boiling point decreases
- iii. Decrease in vapour pressure, boiling point decreases
- iv. Increase in vapour pressure, boiling point increases

Answer. i.

22. Calculate the number of electrons for which $n = 4$ and $s = +1/2$.

Answer. 16