

FINAL NEETUG-2019 EXAMINATION

th

CHEMISTRY

TEST PAPER WITH ANSWER

1. Under isothermal condition, a gas at 300 K expands from 0.1L to 0.25L against a constant external pressure of 2 bar. The work done by the gas is :-
[Given that 1L bar = 100 J]
1 —30 J 2 5kJ 3 25 J 4 30 J

Ans. 1

2. A compound is formed by cation C and anion A. The anions form hexagonal close packed hcp lattice and the cations occupy 75% of octahedral voids. The formula of the compound is :-
1 C₂A₃ 2 C₃A₂ 3 C₃A₄ 4 C₄A₃

Ans. 3

3. pH of a saturated solution of CaOH₂ is 9. The solubility product K_{sp} of CaOH₂ is :-
1 0.5×10^{-15} 2 0.25×10^{-10}
3 0.125×10^{-15} 4 0.5×10^{-10}

Ans. 1

4. The number of moles of hydrogen molecules required to produce 20 moles of ammonia through Haber's process is :-
1 10 2 20 3 30 4 40

Ans. 3

5. For an ideal solution, the **correct** option is :-
1 $\Delta_{mix} S = 0$ at constant T and P
2 $\Delta_{mix} V = 0$ at constant T and P
3 $\Delta_{mix} H = 0$ at constant T and P
4 $\Delta_{mix} G = 0$ at constant T and P

Ans. 3

6. For a cell involving one electron $E_{cell}^{\circ} = 0.59V$ at 298 K, the equilibrium constant for the cell reaction is :-

[Given that $\frac{2.303RT}{F} = 0.9V$ at T 298K]

- 1 1.0×10^2 2 1.0×10^5
3 1.0×10^{10} 4 1.0×10^{30}

Ans. 3

7. Among the following, the one that is **not** a green house gas is :-
1 nitrous oxide 2 methane
3 ozone 4 sulphur dioxide

Ans. 4

8. The number of sigma σ and pi π bonds in pent-2-en-4-yne is :-
1 10 σ bonds and 3 π bonds
2 8 σ bonds and 5 π bonds
3 11 σ bonds and 2 π bonds
4 13 σ bonds and no π bond

Ans. 1

9. Which of the following diatomic molecular species has only π bonds according to Molecular Orbital Theory ?
1 O₂ 2 N₂ 3 C₂ 4 Be₂

Ans. 3

10. Which of the following reactions are disproportionation reaction ?
a $2Cu^{+} \rightarrow Cu^{2+} + Cu^0$
b $3MnO_4^{2-} + 4H^{+} \rightarrow 2MnO_4^{-} + MnO_2 + 2H_2O$
c $2KMnO_4 \xrightarrow{3/4, 3/4} K_2MnO_4 + MnO_2 + O_2$
d $2MnO_4^{-} + 3Mn^{2+} + 2H_2O \rightarrow 5MnO_2 + 4H^{+}$
Select the **correct** option from the following :-
1 a and b only 2 a, b and c
3 a, c and d 4 a and d only

Ans. 1

11. Among the following, the narrow spectrum antibiotic is :-
1 penicillin G 2 ampicillin
3 amoxycillin 4 chloramphenicol

Ans. 1

12. The **correct** order of the basic strength of methyl substituted amines in aqueous solution is :-
1 $CH_3CH_2NH_2 > CH_3NH_2 > CH_3N$
2 $CH_3CH_2N > CH_3NH_2 > CH_3CH_2NH$
3 $CH_3CH_2N > CH_3CH_2NH > CH_3NH_2$
4 $CH_3NH_2 > CH_3CH_2NH > CH_3CH_2N$

Ans. 1

13. Which mixture of the solutions will lead to the formation of negatively charged colloidal $[AgI]^{-}$ sol. ?
1 50 mL of 1M AgNO₃ + 50 mL of 1.5 M KI
2 50 mL of 1M AgNO₃ + 50 mL of 2 M KI
3 50 mL of 2 M AgNO₃ + 50 mL of 1.5 M KI
4 50 mL of 0.1 M AgNO₃ + 50 mL of 0.1 M KI

Ans. 1,2

Final NEETUG-2019 Exam/--2019

14. Conjugate base for Bronsted acids H_2O and HF are:-

- 1 OH^- and H_2F^+ respectively
- 2 H_3O^+ and F^- , respectively
- 3 OH^- and F^- , respectively
- 4 H_3O^+ and H_2F^+ , respectively

Ans. 3

15. Which will make basic buffer ?

- 1 50 mL of 0.1 M NaOH + 25 mL of 0.1 M CH_3COOH
- 2 100 mL of 0.1 M CH_3COOH + 100 mL of 0.1 M NaOH
- 3 100 mL of 0.1 M HCl + 200 mL of 0.1 M NH_4OH
- 4 100 mL of 0.1 M HCl + 100 mL of 0.1 M NaOH

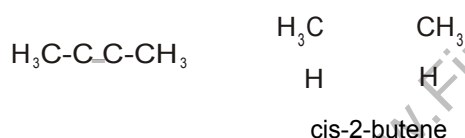
Ans. 3

16. The compound that is most difficult to protonate is:-

- 1 $\text{H} \begin{array}{c} \text{O} \\ \parallel \\ \text{H} \end{array}$
- 2 $\text{H}_3\text{C} \begin{array}{c} \text{O} \\ \parallel \\ \text{H} \end{array}$
- 3 $\text{H}_3\text{C} \begin{array}{c} \text{O} \\ \parallel \\ \text{CH}_3 \end{array}$
- 4 $\text{Ph} \begin{array}{c} \text{O} \text{ H} \end{array}$

Ans. 4

17. The most suitable reagent for the following conversion is :-



- 1 Na/liquid NH_3
- 2 H_2 , Pd/C, quinoline
- 3 Zn/HCl
- 4 $\text{Hg}^{2+}/\text{H}^+$, H_2O

Ans. 2

18. Which of the following species is **not** stable ?

- 1 $[\text{SiF}_6]^{2-}$
- 2 $[\text{GeCl}_6]^{2-}$
- 3 $[\text{SnOH}_6]^{2-}$
- 4 $[\text{SiCl}_6]^{2-}$

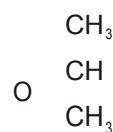
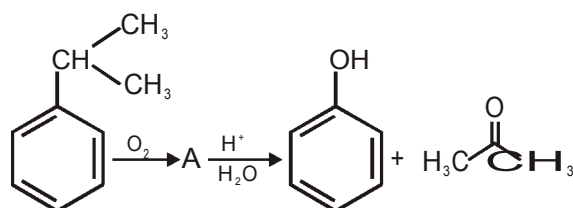
Ans. 4

19. Which of the following is an amphoteric hydroxide?

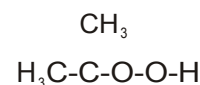
- 1 SrOH
- 2 CaOH
- 3 MgOH
- 4 BeOH

Ans. 4

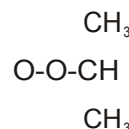
20. The structure of intermediate A in the following reaction is :-



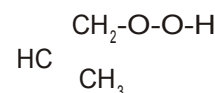
1



2



3



4

Ans. 2

21. The manganate and permanganate ions are tetrahedral, due to

- 1 The π -bonding involves overlap of p-orbitals of oxygen with d-orbitals of manganese
- 2 There is no π -bonding
- 3 The π -bonding involves overlap of p-orbitals of oxygen with p-orbitals of manganese
- 4 The π -bonding involves overlap of d-orbitals of oxygen with d-orbitals of manganese

Ans. 1

22. For the second period elements the **correct** increasing order of first ionisation enthalpy is :-

- 1 $\text{Li} < \text{Be} < \text{B} < \text{C} < \text{N} < \text{O} < \text{F} < \text{Ne}$
- 2 $\text{Li} < \text{B} < \text{Be} < \text{C} < \text{O} < \text{N} < \text{F} < \text{Ne}$
- 3 $\text{Li} < \text{B} < \text{Be} < \text{C} < \text{N} < \text{O} < \text{F} < \text{Ne}$
- 4 $\text{Li} < \text{Be} < \text{B} < \text{C} < \text{O} < \text{N} < \text{F} < \text{Ne}$

Ans. 2

23. If the rate constant for a first order reaction is k , the time t required for the completion of 99% of the reaction is given by :-

- 1 $t = 0.693/k$ 2 $t = 6.909/k$
3 $t = 4.606/k$ 4 $t = 2.303/k$

Ans. 3

24. Identify the **incorrect** statement related to PCl_5 from the following :-

- Three equatorial P-Cl bonds make an angle of 120° with each other
- Two axial P-Cl bonds make an angle of 180° with each other
- Axial P-Cl bonds are longer than equatorial P-Cl bonds
- PCl_5 molecule is non-reactive

Ans. 4

25. 4d, 5p, 5f and 6p orbitals are arranged in the order of decreasing energy. The **correct** option is :-

- 1 $5f > 6p > 5p > 4d$ 2 $6p > 5f > 5p > 4d$
3 $6p > 5f > 4d > 5p$ 4 $5f > 6p > 4d > 5p$

Ans. 1

26. The biodegradable polymer is :-

- 1 nylon-6,6 2 nylon 2-nylon 6
3 nylon-6 4 Buna-S

Ans. 2

27. Match the Xenon compounds in **Column-I** with its structure in **Column-II** and assign the **correct** code:-

Column-I		Column-II	
a	XeF_4	i	pyramidal
b	XeF_6	ii	square planar
c	XeOF_4	iii	distorted octahedral
d	XeO_3	iv	square pyramidal

Code :

a	b	c	d
1 i	ii	iii	iv
2 ii	iii	iv	i
3 ii	iii	i	iv
4 iii	iv	i	ii

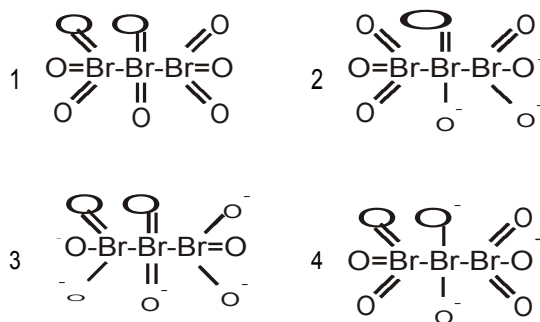
Ans. 2

28. Which is the **correct** thermal stability order for H_2E $\text{E}=\text{O}, \text{S}, \text{Se}, \text{Te}$ and Po ?

- $\text{H}_2\text{S} < \text{H}_2\text{O} < \text{H}_2\text{Se} < \text{H}_2\text{Te} < \text{H}_2\text{Po}$
- $\text{H}_2\text{O} < \text{H}_2\text{S} < \text{H}_2\text{Se} < \text{H}_2\text{Te} < \text{H}_2\text{Po}$
- $\text{H}_2\text{Po} < \text{H}_2\text{Te} < \text{H}_2\text{Se} < \text{H}_2\text{S} < \text{H}_2\text{O}$
- $\text{H}_2\text{Se} < \text{H}_2\text{Te} < \text{H}_2\text{Po} < \text{H}_2\text{O} < \text{H}_2\text{S}$

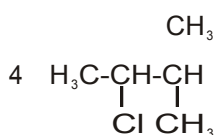
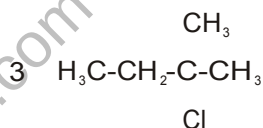
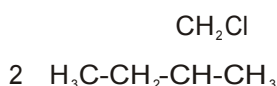
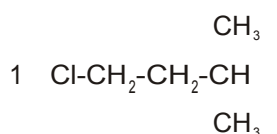
Ans. 3

29. The **correct** structure of tribromooxide is :-



Ans. 1

30. An alkene "A" on reaction with O_3 and $\text{Zn-H}_2\text{O}$ gives propanone and ethanal in equimolar ratio. Addition of HCl to alkene "A" gives "B" as the major product. The structure of product "B" is :-



Ans. 3

31. Enzymes that utilize ATP in phosphate transfer require an alkaline earth metal M as the cofactor.

M is :

- 1 Be 2 Mg
3 Ca 4 Sr

Ans. 2

32. Which one is malachite from the following ?

- 1 CuFeS_2 2 CuOH_2
3 Fe_3O_4 4 $\text{CuCO}_3 \cdot \text{CuOH}_2$

Ans. 4

Final NEETUG-2019 Exam/--2019

- 33.** Which of the following series of transitions in the spectrum of hydrogen atom falls in visible region ?
 1 Lyman series 2 Balmer series
 3 Paschen series 4 Brackett series

Ans. 2

- 34.** The mixture that forms maximum boiling azeotrope is :
 1 Water + Nitric acid
 2 Ethanol + Water
 3 Acetone + Carbon disulphide
 4 Heptane + Octane

Ans. 1

- 35.** For the cell reaction
 $2\text{Fe}^{3+}(\text{aq}) + 2\text{I}^{-}(\text{aq}) \rightarrow 2\text{Fe}^{2+}(\text{aq}) + \text{I}_2(\text{aq})$
 $E_{\text{cell}}^{\circ} = 0.24\text{V}$ at 298 K. The standard Gibbs energy

$\Delta_r G^{\circ}$ of the cell reaction is :

- [Given that Faraday constant $F = 96500 \text{ C mol}^{-1}$]
 1 $-46.32 \text{ kJ mol}^{-1}$
 2 $-23.16 \text{ kJ mol}^{-1}$
 3 $46.32 \text{ kJ mol}^{-1}$
 4 $23.16 \text{ kJ mol}^{-1}$

Ans. 1

- 36.** In which case change in entropy is negative ?
 1 Evaporation of water
 2 Expansion of a gas at constant temperature
 3 Sublimation of solid to gas
 4 $2\text{Hg} \rightarrow \text{H}_2\text{g}$

Ans. 4

- 37.** Match the following :

- | | |
|--------------------|---------------------------------|
| a Pure nitrogen | i Chlorine |
| b Haber process | ii Sulphuric acid |
| c Contact process | iii Ammonia |
| d Deacon's process | iv Sodium azide or Barium azide |

Which of the following is the **correct** option ?

- | | a | b | c | d |
|---|-----|-----|-----|-----|
| 1 | i | ii | iii | iv |
| 2 | ii | iv | i | iii |
| 3 | iii | iv | ii | i |
| 4 | iv | iii | ii | i |

Ans. 4

- 38.** Which of the following is **incorrect** statement ?
 1 PbF_4 is covalent in nature
 2 SiCl_4 is easily hydrolysed
 3 GeX_4 $\text{X} = \text{F}, \text{Cl}, \text{Br}, \text{I}$ is more stable than GeX_2
 4 SnF_4 is ionic in nature

Ans. 1

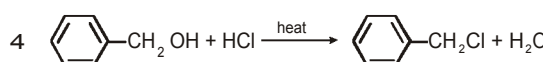
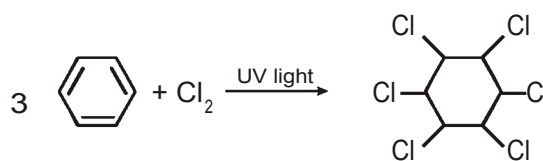
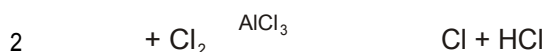
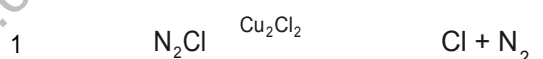
- 39.** The non-essential amino acid among the following is :
 1 valine 2 leucine
 3 alanine 4 lysine

Ans. 3

- 40.** A gas at 350 K and 15 bar has molar volume 20 percent smaller than that for an ideal gas under the same conditions. The **correct** option about the gas and its compressibility factor Z is :
 1 $Z > 1$ and attractive forces are dominant
 2 $Z > 1$ and repulsive forces are dominant
 3 $Z < 1$ and attractive forces are dominant
 4 $Z < 1$ and repulsive forces are dominant

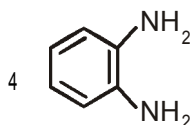
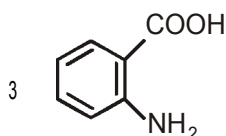
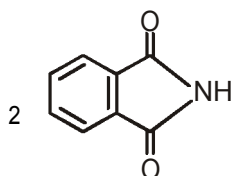
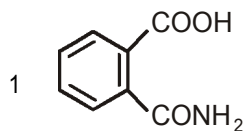
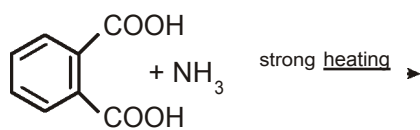
Ans. 3

- 41.** Among the following, the reaction that proceeds through an electrophilic substitution is :



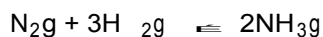
Ans. 2

42. The major product of the following reaction is :



Ans. 2

43. For the chemical reaction



the **correct** option is :

1 $-\frac{1}{3} \frac{d[\text{H}_2]}{dt} = -\frac{1}{2} \frac{d[\text{NH}_3]}{dt}$

2 $-\frac{d[\text{N}_2]}{dt} = 2 \frac{d[\text{NH}_3]}{dt}$

3 $-\frac{d[\text{N}_2]}{dt} = \frac{1}{2} \frac{d[\text{NH}_3]}{dt}$

4 $3 \frac{d[\text{H}_2]}{dt} = 2 \frac{d[\text{NH}_3]}{dt}$

Ans. 3

44. What is the **correct** electronic configuration of the central atom in $\text{K}_4[\text{Fe}(\text{CN})_6]$ based on crystal field theory ?

1 $t_{2g}^4 e_g^2$

2 $t_{2g}^6 e_g^0$

3 $e^3 t_2^3$

4 $e^4 t_2^2$

Ans. 2

45. The method used to remove temporary hardness of water is :

1 Calgon's method

2 Clark's method

3 Ion-exchange method

4 Synthetic resins method

Ans. 2