



ROLL NO.	
NAME	
CLASS & SECTION	

APEEJAY COMMON ANNUAL EXAMINATION, 2018-19

04

CLASS-XI
CHEMISTRY

Time allowed : 3 hrs.

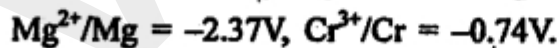
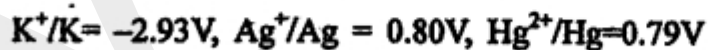
Maximum Marks : 70

General Instructions :

- (i) All questions are compulsory.
- (ii) Marks for each question are indicated against it.
- (iii) Q. Nos. 1 to 5 are very short answer questions, each of one mark. Answer these in one sentence each.
- (iv) Q. Nos. 6 to 12 are short answer questions of two marks each. Answer these in about 30 words each.
- (v) Q. Nos. 13 to 24 are short answer questions of three marks each. Answer these in about 40 words each.
- (vi) Q. Nos. 25 to 27 are long answer questions of five marks each. Answer these in about 70 words each.
- (v) Use log tables if necessary. Calculators are not permitted.

1. Calculate the amount of water(g) produced by the combustion of 16g of methane ? (atomic mass of C=12, H=1, O=16). (1)

2. Given the standard electrode potentials,



Arrange these metals in their increasing order of reducing power.

OR

Calculate the oxidation number of Mn in K_2MnO_4 and N in HNO_3 (1)

3. Why is LiI more soluble than KI in ethanol ? (1)

P.T.O.

4. Why are crystalline solids anisotropic? (1)
5. Which of the following species will have the largest and the smallest size ?



OR

On the basis of quantum numbers, justify that the sixth period of the periodic table should have 32 elements.

6. Give the balanced chemical equation for the following : (2)
- (a) white phosphorus is heated with conc. NaOH solution in an inert atmosphere of carbon dioxide.
- (b) thermal decomposition of ammonium dichromate.

OR

Give the balanced chemical equation for the following :

- (a) silicon dioxide is heated with sodium hydroxide.
- (b) preparation of silicones.
7. (a) Arrange the isomers of pentane in the increasing order of their boiling points.
- (b) Draw the cis- and trans-structures for Hex-2-ene. Which isomer will have higher boiling point and why? (2)
8. (a) Predict if the reaction between $\text{Fe}^{3+}(\text{aq})$ and $\text{Cu}(\text{s})$ is feasible
- $$E^{\circ}_{\text{Fe}^{3+}/\text{Fe}^{2+}} = 0.77 \text{ V and } E^{\circ}_{\text{Cu}^{2+}/\text{Cu}} = 0.34 \text{ V.}$$
- (b) Depict the galvanic cell in which the reaction :
- $$\text{Zn}(\text{s}) + 2\text{Ag}^+(\text{aq}) \rightarrow \text{Zn}^{2+}(\text{aq}) + 2\text{Ag}(\text{s}) \text{ takes place.} \quad (2)$$
9. (a) How would you account for lower atomic radius of Ga as compared to Al?
- (b) Give chemical equation involved when Al is treated with dilute NaOH. (2)
10. (a) Draw the structural formula of 1-Phenyl propan-1-one molecule.
- (b) Give the IUPAC name of tertiary butylalcohol. (2)
11. (a) In the following set of quantum numbers
- (i) $n = 4, l = 2, m_l = -1, m_s = -1/2$
- (ii) $n = 4, l = 1, m_l = 0, m_s = -1/2$
- Identify the orbitals, which one of these has higher energy and why?
- (b) The Br-atom possesses 35 electrons. It contains 6 electrons in 2p orbital, 6 electrons in

3p orbital and 5 electron in 4p orbital. Which of these electrons experiences the lowest effective nuclear charge?

OR

(a) Name the orbital in which the electron with following quantum numbers is present :

$$n = 4, l = 2, m_l = -2, m_s = -1/2$$

(b) What is the value of n that allows g orbitals to exist ?

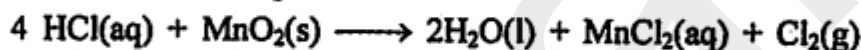
(c) How many electrons in an atom may have the following quantum numbers :

$$n = 4, m_s = 1/2. \quad (2)$$

12. Write the electronic configuration of Fe, Fe²⁺, and Fe³⁺. Which is most stable and why? (2)
13. Calculate the concentration of nitric acid in moles per litre in a sample which has a density, 1.41 g mL⁻¹ and mass percent of nitric acid in it being 69%. (at. Mass of N=14, O=16)

OR

Chlorine is prepared in the laboratory by treating manganese dioxide (MnO₂) with aqueous hydrochloric acid according to the reaction.



What mass of Cl₂ will be formed when 25 mL of 0.5M HCl reacts with 100 g of MnO₂? Name the limiting reactant. Calculate the amount of reactant left unreacted.

[Atomic Mass of Mn=55, Cl=35.5, O=16, H=1] (3)

14. (a) The increasing order of reactivity among group 1 elements is Li < Na < K < Rb < Cs whereas that of group 17 is F > Cl > Br > I. Explain
- (b) Assign the period and group of the element having outer electronic configuration (n-1)d²ns² for n=4. (3)
15. (a) Calculate the bond order of N₂, O₂, O₂⁺ and O₂⁻.
- (b) Apart from tetrahedral geometry, another possible geometry of CH₄ is square planar. Explain why CH₄ is not square planar?

OR

Answer the following questions :

- (a) Write the important conditions required for the linear combination of atomic orbitals to form molecular orbitals.
- (b) Why are the axial bonds longer as compared to equatorial bonds in PCl₅?
- (c) Why is ortho nitro phenol steam volatile? (3)
16. (a) Draw the shapes of XeF₄ and ClF₃ on the basis of VSEPR theory.
- (b) Draw lewis dot structure of CO molecule showing the formal charge and lone pairs. (3)

(3) Chem - x1

17. (a) 2.9 gm of a gas at 95°C occupies the same volume as 0.184 gm of H_2 at 17°C at the same pressure. What is the molar mass of gas?
(b) Explain the physical significance of vander waal parameters. (3)
18. (a) Among NH_3 , H_2O , HF which would you expect to have highest magnitude of hydrogen bonding and why?
(b) Write one characteristic and one use of electron deficient hydrides.

OR

- (a) Write chemical reaction to show the amphoteric nature of water?
(b) How does hydrogen peroxide react with KMnO_4 in acidic medium? (3)
19. Explain, why
(a) Beryllium and magnesium do not impart colour to flame like other alkaline earth metals.
(b) Potassium and Cesium is used in photoelectric cells but not lithium.
(c) Alkali metals and Alkaline earth metals cannot be obtained by chemical reduction methods. (3)
20. Give balanced chemical equation for the following :
(a) Diborane reacts with ammonia followed by heating.
(b) Boric acid is added to water. (3)
21. (a) Draw the resonating structures of phenol. Show the electron shift using curved arrow notation.
(b) Convert : benzene into p-nitrotoluene (3)
22. (a) Arrange in the order of increasing acidic strength :
 CCl_3COOH , CHCl_2COOH and CH_2ClCOOH
(b) Arrange in the order of increasing stability :
 $(\text{CH}_3)_3\text{C}^+$, $(\text{CH}_3)_2\text{CH}^+$, CH_3CH_2^+
(c) Give an example of electrophile and nucleophile.

OR

- (a) How many sigma and pi-bonds are present in $\text{CH} \equiv \text{CCH} = \text{CHCH}_3$?
(b) The molecular formula of the organic compound is $\text{C}_4\text{H}_{10}\text{O}$. Draw the metamers of this compound. Also give their name. (3)
23. Write short notes on :
(a) BOD
(b) photochemical smog

(4)

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