AMRITA VIDYALAYAM

ANNUAL EXAMINATION 2019 - 20

Class : XI **Marks : 70**

Time : 3 hrs

CHEMISTRY (043)

General Instructions:

1. All questions are compulsory.

2. Questions 1 to 10 are multiple choice questions of 1 mark each.

3. Questions 11 to 20 are very short answer questions of 1 mark each.

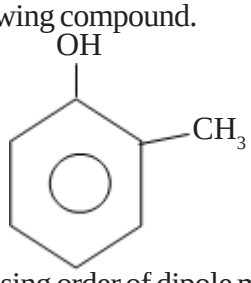
4. Questions 21 to 27 are short answer questions of 2 marks each.

5. Questions 28 to 34 are long answer questions of 3 marks each.

6. Question 35 to 37 are long answer questions of 5 marks each.

7. Use log tables if necessary. Use of calculator is not allowed.

1. Which of the following quantum number designates the orientation of the orbital? (principal, azimuthal, magnetic, spin)
2. For which of the following species Bohr's theory is not applicable?
   a) Be^{3+} b) Li^{2+} c) He^{2+} d) H
3. The wave length of which series lie toward the visible region? (Lymann, Balmer, Paschen, Pfund)
4. The ion that is isoelectronic with CO is _____.
   a) O_2^- b) N_2^+ c) CN^- d) O_2^+
5. The molecule which does not exhibit dipolemoment is _____.
   a) NH_3 b) $CHCl_3$ c) H_2O d) CCl_4
6. Benzoic Acid when heated with soda lime yields _____. (Benzaldehyde, Benzene, Toluene, Benzyl Alcohol)
7. Which one is an electrophile?
   a) H_2O b) BF_3 c) R_3N d) R_2NH
8. The order of acidic strength of boron trihalide is _____.
   a) $BCl_3 < BBr_3 < BI_3 < BF_3$ b) $BF_3 < BCl_3 < BBr_3 < BI_3$
   c) $BI_3 < BBr_3 < BCl_3 < BF_3$ d) $BBr_3 < BCl_3 < BF_3 < BI_3$
9. Dead burnt plaster is _____.
   a) $CaSO_4.\ 2H_2O$ b) $CaSO_4$ c) $CaSO_{4.½}H_2O$ d) $CaSO_4.H_2O$
10. The compressibility factor for an ideal gas is _____. (2, 1, 0, ∞)
11. How many orbitals are present in the M-Shell?
12. What would be the IUPAC name and symbol for the element with atomic number 120?
13. The radio active series consisting of man made elements are called _____.
14. O-Nitrophenol has lower boiling point than P- Nitrophenol due to _____.
15. Write the IUPAC name of the following compound.



16. Arrange the molecules in the increasing order of dipole moment.
    BF_3, NH_3, NF_3

17. Write the expression for Van der waal's equation for the gases.
18. Write the structure of following organic compound 1 - chloro - ethyl cyclohexane.
19. A gas behaves most like an ideal gas under the condition of _____ and _____.
20. Thermodynamically the most stable form of carbon is _____.
21. a) Explain why Na^+ is smaller in size than Na atom.
    b) Why are Bohr's orbits called stationary states?
22. a) What are iso electronic species?
    b) Write a cation and an anion which is isoelectronic with Ar.
23. Mention two similarities in the behavior of Be and Al to show they have diagonal relationship.
24. a) What is meant by the term bond order?
    b) Calculate the bond order of N_2.
25. Account for the following.
    a) Boron halides do not dimerise like BH_3.
    b) $PbCl_4$ is a good oxidizing agent.

    OR

    Complete the reactions.
    a) $B_2H_6 + 3O_2 \rightarrow$ b) $2BF_3 + 6NaH \xrightarrow{450k}$
26. a) Electron gain enthalpy of fluorine is less negative than that of chlorine. Explain.
    b) Why is ionization enthalpy of nitrogen is more than that of oxygen.
27. Discuss the chemistry of Lassaigne's test.

    OR

    Explain the different types of structural isomerism with example.
28. a) In terms of Charle's law explain why -273^0C is the lowest temperature?
    b) 20 ml of hydrogen measured at 15^0C are heated to 35^0C . What is the new volume at the same pressure?
29. Explain the method of preparation of sodium carbonate.
30. a) State Heisenberg's uncertainity principle.
    b) Electrons are emitted with zero velocity from a metal surface when it is exposed to a radiation of wavelength 6800 A^0. Calculate the threshold frequency and work function of the metal.

    OR

    a) Write the electronic configuration of Cu^{2+} ion.
    b) Write the orbital with the following quantum numbers.
    (i) n = 2 l = 1 (ii) n = 4 l = 0 (iii) n = 5 l = 3 (iv) n = 3 l = 2
31. Write the reactions.
    a) Wurtz reaction b) Decarboxylation c) Friedel Craft alkylation reaction

    OR

    Complete the reactions.
    a) $CH_3 - CH = CH_2 + HBr \xrightarrow[\text{dry ether}]{\text{Peroxide}}$ b) $CH_3 - Cl + Na \xrightarrow{\text{alc KOH}}$
    c) $CH_3 - \underset{\displaystyle Cl}{\underset{|}{CH}} - CH_2 - CH_3 \xrightarrow{}$
32. a) Give the condensed and bond-line structured formulae for the following compounds.
    (i) 2, 2, 4 - trimethyl pentane (ii) 3 methyl but - 1 - ene
    b) How many σ and π bonds are present in the following compounds?
    (i) $CH_2 = C\ CH_2$ (ii) C_6H_6
33. a) State the hybridization and shape of PCl_5.
    b) Use molecular theory to explain Be_2 molecule does not exist.
34. a) Write the structure of diborane and explain the nature of bonding in it.
    b) $[SiF_6]^{2-}$ is known where as $[SiCl_6]^{2-}$ not. Give reason.

35. a) Write the postulates of VSEPR theory.
b) Calculate the bond order in O_2 and F_2.
c) Comment on the dipole moment of CO_2.

36. a) Account for the following.
(i) Atomic radius of Gallium is less than that of Aluminium.
(ii) Carbon Monoxide is poisonous.
b) What are silicones? Explain the preparation of silicones.
c) Explain the term inert pair effect.

OR

What happens when
a) Borax is heated strongly?
b) Boric acid is added to water?
c) Al is treated with dilute NaOH?
d) BF_3 is reacted with NH_3?
e) SiO_2 is treated with HF?

37. a) What are the necessary conditions for any system to be aromatic?
b) Draw the cis and trans isomers of Hex - 2 - ene.
c) How can you convert the following compounds to benzene?
(i) ethyne (ii) phenol