AMRITA VIDYALAYAM

ANNUAL EXAMINATION 2018 -'19

Class : XI **Marks : 70**

Time : 3 hrs

CHEMISTRY (043)

General Instructions:

1. All questions are compulsory.

2. Question No. 1 to 5 are very short answer questions of 1 mark each.

3. Question No. 6 to 12 are short answer questions of 2 marks each.

4. Question No. 13 to 24 are also short answer questions of 3 marks each.

5. Question No. 25 to 27 are long answer questions of 5 marks each.

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

1. Write the structural formulae of But-3-en-1-ol.

OR

Write the IUPAC name of $CH_3 - CH_2 - CH(OH) - CH_2 - CH_2 - CH(CH_3) - CH_2 - CH_3$.

2. What is dead burnt plaster?
3. What would be the SI unit of the quantity PV^2T^2/n.

OR

Falling liquid drops are spherical. Why?

4. Give the general electronic configuration of d-block elements.
5. Explain the Le-Chatelier's principle.
6. What are electrophiles and nucleophiles? Explain with examples.
7. Discuss the chemistry of Lassaigne's test.
8. Explain Wurtz reaction.

OR

Explain Freidel craft alkylation reaction.

9. Explain the structure of Diborane.
10. Write reactions to justify amphoteric nature of Aluminium.
11. Potassium carbonate cannot be prepared by solvay process. Why?
12. Why are Lithium salts commonly hydrated and those of other alkali metal ions usually anhydrous?
13. Write the IUPAC names of the product obtained by addition reaction of HBr to Hex-1-ene.

    a) In the absence of peroxide. b) In the presence of peroxide.
14. What are the necessary conditions for any compound to show aromaticity?

OR

Write the IUPAC names of the products obtained by the ozonolysis of Pent-2-ene compound.

15. What happens when

    a) magnesium is burnt in air? b) quick lime is heated with silica?

    c) chlorine reacts with slaked lime?
16. A 100 Watt bulb emits monochromatic light of wave length 400 nm. Calculate the number of photons emitted per second by the bulb.

OR

a) State Hund's rule of maximum multiplicity.

b) Calculate the number of electrons present in one mole of methane.

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

(i) $n = 4, m_s = 21/2$ (ii) $n = 3, l = 0$

17. The PK_a of acetic acid and PK_b of ammonium hydroxide are 4.76 and 4.75 respectively. Calculate the pH of ammonium acetate solution.

18. Write the conjugate acids for the following bronsted base NH_2^-, NH_3, $HCOO^-$ and HSO_4^-.

19. What happens when

a) Borax is heated strongly? b) Boric acid is added to water?

c) BF_3 is reacted with ammonia?

OR

Give one method for industrial preparation and one for laboratory preparation of CO and CO_2 each.

20. Write three differences between sigma bond and pi bond.

OR

a) Which out of NH_3 and NF_3 has higher dipole moment? Why?

b) Draw the Lewis structure for CO_3^{2-}.

21. Consider the following species N^{3-}, O^{2-}, F^-, Na^+, Mg^{2+} and Al^{3+}.

a) What is common in them?

b) Arrange them in the order of increasing ionic radii.

22. Explain.

a) Would you expect the first ionization enthalpies for two isotopes of the same element to be the same or different? Justify your answer.

b) Which of the following pairs of elements would have a more negative electron gain enthalpy?

(i) O or F (ii) F or Cl

23. A golf ball has a mass of 40 g and speed of 45 m/s. If the speed can be measured within accuracy of 2%, calculate the uncertainty in the position.

24. Explain.

a) State Pauli's exclusion principle.

b) Using s, p, d, f notation describe the orbital with the following quantum numbers.

(i) n = 2, l = 1 (ii) n = 4, l = 0 (iii) n = 5, l = 3

25. Explain the terms inductive and electromeric effects. Which electron displacement effect explains the following correct order of acidity of the carboxyilic acids?

$Cl_3CCOOH > Cl_2CHCOOH > ClCH_2COOH$

OR

a) On complete combustion 0.246 g of an organic compound gave 0.198 g of carbon dioxide and 0.101 g of water. Determine the percentage composition of carbon and hydrogen in the compound.

b) What are the hybridisation states of each carbon atom in the following compounds?

(i) $CH_2 = C = O$ (ii) $CH_3 - CH_2 - CH_3$

26. What is meant by the term bond order? Calculate the bond order of N_2, O_2, O_2^+, O_2^-.

OR

a) Describe the hybridisation in the case PCl_5. Why are the axial bonds longer as compared to equatorial bond?

b) Use molecular orbital theory to explain why the Be_2 molecule does not exist.

27. a) On a ship sailing in Pacific Ocean where temperature is 23.4^0 C, a balloon is filled with 2 L air. What will be the volume of the balloon when the ship reaches Indian Ocean, where temperature is 26.1^0 C.

b) Explain the physical significance of Vanderwaal's parameter.

OR

a) Derive ideal gas equation.

b) In terms of Charle's law explain why -273^0 C is the lowest possible temperature.

c) Critical temperature for carbon dioxide and methane are 31.1^0 C and -81.9^0 C respectively. Which of these has stronger intermolecular forces and why?