V11C

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Standard 11
CHEMISTRY

Time Allowed: 3.00 Hours   Maximum Marks: 70

PART - I

Note: i) Answer all the questions.   15×1=15
ii) Choose the most appropriate answer and write.

1) Relative molecular mass of hydrogen molecule (H_2) is
   a) 2.016U   b) 1.008U   c) 180U   d) 1U

2) The actual electornic configuration of Cr is
   a) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^4\ 4s^2$ b) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^5\ 4s^1$
   d) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^9\ 4s^2$ d) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^{10}\ 4s^1$

3) Find the atomic number of the temporary symbol Uno.
   a) 106   b) 107   c) 108   d) 109

4) Water is a
   a) basic oxide   b) acidic oxide
   c) amphoteric oxide   d) none of these

5) _____ is used in devising photoelectric cells.
   a) Caesium   b) Potassium   c) Sodium   d) Lithium

6) 25g of each of the following gases are taken at 27°C and 600 mm Hg pressure. Which of these will have the least volume?
   a) HBr   b) HCl   c) HF   d) HI

7) In an isothermal reversible compression of an ideal gas the sign of q, Δs, and w are respectively.
   a) +, −, −   b) −, +, −   c) +, −, +   d) −, −, +

8) $\dfrac{Kc}{Kp}$ for the reaction, $N_{2(g)} + 3H_{2(g)} \rightleftharpoons 2NH_{3(g)}$ is

   a) $\dfrac{1}{RT}$ b) $\sqrt{RT}$ c) RT   d) $(RT)^2$

9) The molality of a solution containing 1.8g of glucose dissolved in 250g of water is
   a) 0.2M   b) 0.01M   c) 0.02M   d) 0.04M

10) Which of these represents the correct order of their increasing bond order?
    a) $C_2 < C_2^{2-} < O_2^{2-} < O_2$ b) $C_2^{2-} < C_2^{+} < O_2 < O_2^{2-}$
    c) $O_2^{2-} < O_2 < C_2^{2-} < C_2^{+}$ d) $O_2^{2-} < C_2^{+} < O_2 < C_2^{2-}$

11) Select the molecule which has only one π bond
    a) $CH_3–CH = CH–CH_3$ b) $CH_3–CH = CH–CHO$
    c) $CH_3–CH = CH–COOH$ d) All of these

12) Which of the following carbocation will be most stable?
    a) $Ph_3C^{+}–$ b) $CH_3–C^{+}H_2–$ c) $(CH_3)_2–{}^{+}CH$ d) $CH_2 = CH–{}^{+}CH_2$

13) _____ shaped polynuclear hydrocarbons are much more toxic and carcinogenic.
    a) "A"   b) "B"   c) "C"   d) "L"

14) What the name of this compound CCl_2F_2 is
    a) Freon - 22   b) Freon - 1, 3   c) Freon - 12   d) Freon - 0, 0

15) The pH of normal rain water is
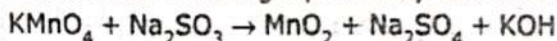   a) 6.5   b) 7.5   c) 5.6   d) 4.6

PART - II

Note: i) Answer any six questions.   6×2=12
ii) Question No. 24 is compulsory.

16) Balance the following equation by oxidation number method:
    $KMnO_4 + Na_2SO_3 \rightarrow MnO_2 + Na_2SO_4 + KOH$

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17) Explain the diagonal relationship.
18) How is plaster of paris prepared?
19) Distinguish between diffusion and effusion.
20) State Le-Chatelier principle.
21) Define Normality.
22) Write a note on homologous series.
23) Why chlorination of methane is not possible in dark?
24) On the basis of chemical reactions involved, explain how do CFC's cause depletion of ozone layer in stratosphere?

PART - III

Note: Answer any six questions. Question No. 33 is compulsory.   6×3=18

25) State and explain Pauli exclusion principle.
26) Explain the exchange reactions of deuterium.
27) Describe briefly the biological importance of calcium and magnesium.
28) Define the term isotonic solution.
29) Define fajan's rule.
30) Explain electromeric effect.
31) Explain the preparation of the following compounds:
    (i) DDT   (ii) Chloroform
32) Differentiate the following:
    i) BOD and COD
    ii) Viable and non-viable particulate pollutants
33) Calculate the entropy change during the melting of one mole of ice into water at 0°C and 1 atm pressure. Enthalpy of fusion of ice is 6008 J mol^{-1}.

PART - IV

Note: Answer all the questions.   5×5=25

34) a) A compound on analysis gave Na = 14.31%, S = 9.97%, H = 6.22% and O = 69.5%. Calculate the molecular formula of the compound, if all the hydrogen in the compound is present in combination with oxygen as water of crystallization. (molecular mass of the compound is 322).
    (OR)
    b) i) Describe the Aufbau principle.
       ii) Give the electronic configuration of Mn^{2+} and Cr^{3+}.
35) a) Explain the Pauling method for the determination of ionic radius.
    (OR)
    b) i) Mention the uses of deuterium.
       ii) Why interstitial hydrides have a lower density than the parent metal?
36) a) i) An unknown gas diffuses at a rate of 0.5 time that of nitrogen at the same temperature and pressure calculate the molar mass of the unknown gas.
       ii) A sample of gas at 15°C at 1 atm has a volume of 2.58 dm^3. When the temperature is raised to 38°C at 1 atm does the volume of the gas increase? If so, calculate the final volume?
    (OR)
    b) List the characteristics of internal energy.
37) a) Derive the relation between Kp and Kc.
    (OR)
    b) Describe the classification of organic compounds based on their structure.
38) a) i) What are electrophiles and nucleophiles? Give suitable examples for each.
       ii) β - elimination - Explain.
    (OR)
    b) Explain Markow nikoff's rule and anti Markow nikoff's rule with suitable example.